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Geotechnics • Environment • Groundwater

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Document Transmittal

TO Contaminated Land Unit
..... Environmental Protection Agency
..... Level 11 160 Ann Street
..... **BRISBANE QLD 4000**
ATTENTION Mr Mark Paton
DATE 29 January 2003 PROJECT No. 33292A

Your Ref: BNE 9175

We enclose the following:

Quantity	Title	Comments
1 Copy	Response to EPA Request for Additional Information ACU Site 53 Prospect Road, Mitchelton	

Sent to you

- ☐ Project completed
☐ For your records
☒ For your approval / comments

- ☐ Being returned
☐ As requested by
☐ To be checked and returned

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- ☐ Mail
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☐ Facsimile



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Integrated Practical Solutions



Document Transmittal

TO Contaminated Land Unit
EPA

ATTENTION MR. MARK PATON

DATE 7-2-3 PROJECT No. _____



We enclose the following:

Your Ref: BNE 9175

Quantity	Title	Comments
1	Stage 1 report	ACU Site
1	Stat. Dec.	Mitchelton.

Sent to you

- ☐ Project completed
☒ For your records
☐ For your approval/comments

- ☐ Being returned
☐ As requested by
☐ To be checked and returned

Sent via

- ☐ Mail
☒ Courier
☐ Facsimile

sch4p4(6) Personal information

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STATUTORY DECLARATION

Address of Site Investigated: Australian Catholic University
53 Prospect Road
MITCHELTON QLD 4053

Real Property Description: Lot 2 on RP 155212

Title of Report: Response to EPA Request for Additional Information
Australian Catholic University
53 Prospect Road
MITCHELTON

I, Alan Norman Lee, of Douglas Partners Pty Ltd, 439 Montague Road, West End in the State of Queensland, do solemnly and sincerely declare that:

- I was the investigator and report preparer of the report described above;
- My qualifications and experience as outlined are relevant to this investigation;
- I have not knowingly included any false, misleading or incomplete information in the report;
- I have not knowingly failed to reveal any relevant information or document to the administering authority; and

I certify that:

- The report addresses the relevant matters for the investigation and is factually correct; and
- The opinions expressed in it are honestly and reasonably held.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *Oaths Act 1867*

sch4p4(6) Personal information

Signature

Name

Alan Norman Lee

Declared before me at

Brisbane, this 3rd day of February 2003

Witness (Justice of the Peace/Commissioner for Declarations)

Name

James Daly

Signature

sch4p4(6) Personal information





AL
28 January 2003

Contaminated Land Unit
Environmental Protection Agency
GPO Box 2771
BRISBANE QLD 4001

Attention: Mr Mark Paton

Dear Mark,



**RESPONSE TO EPA REQUEST FOR ADDITIONAL INFORMATION
AUSTRALIAN CATHOLIC UNIVERSITY SITE, 53 PROSPECT ROAD, MITCHELTON**

YOUR REF: BNE 9175

This letter report is a response to the request from the EPA for additional information dated 10 December 2002 regarding proposed remediation works at the above site. Dot points in the EPA letter have been numbered as shown in Appendix A, and numbered responses in this report refers to the requests in the numbered points.

1. EPA Fees

Whilst three allotments are included in the proposed development, contamination issues apply only to Lot 2 on RP 155212. Hence, the payment of only one EPA fee of \$900 has been made.

2. Complete Report

A full copy of the Stage 1 report of October 2002 by Douglas Partners is attached separately.

3. Site Plans

A site plan showing the existing allotments is attached as Drawing No 1 in Appendix C. Current site features have been surveyed and are shown on Drawing No 2 in Appendix C along with other information.

4. All Sampling Locations

Test locations for the current and all previous investigations are shown on the attached Drawing No 2. Each test location has been highlighted in various colours to indicate whether asbestos was found.

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5 and 6. Test Pit Logs

Test pit logs are included in Appendix D as follows:

- logs of the current investigation (Douglas Partners, January 2003); and
- compiled copies of logs from previous investigations at the site.

Logs of test pits in the Stage 1 report were based on visual observations of the occurrence of asbestos and its relationship with fill or natural soil. No further recordings were made about soil types in the fill or in natural soil.

Soil types were noted in the logs for the current investigations, and as these test pits were within a few metres of the Stage 1 pits, the soil types are generally similar.

7. Geology

The southeastern corner of the ACU site is relatively low elevation, and runoff waters flow generally easterly through this area from the surrounding higher ground to the north, south and west. Natural soil under the surface filling in virtually all test pits encountered various silts and sands, which are typical of fluvial deposits. The deepest test pits excavated to approximately 4.0 metres (TP 41-43) in the area of the proposed containment cell also showed typical sandy and silty soils throughout their depths. The exception was in the more elevated area near the carpark (TP 29-33) where natural soil was harder and gravelly, indicating that it was formed by weathering of the Bunya Phyllite strata rather than from fluvial deposits.

The aerial photos showed that during the period of exposure of the ACU site to asbestos in the 1960s and early 1970s, the location of the creek in the southern site area has been generally on or close to its current location. Only minor changes in location were indicated in the photos, probably due to nearby drainage works.

It does not appear likely that any previous location of the creek has been significant in the occurrence of asbestos at the site. It may have been significant if the location of the creek had been substantially changed, and perhaps old creek bed(s) may have been filled with asbestos. However, as the location of the creek has not substantially changed, and surrounding test pits have always found natural soil at depth, filling in the creek bed does not appear to have occurred.

8. Review of Aerial Photographs

The following aerial photos were reviewed by previous investigations at the ACU site and adjoining factory site:

Site Investigations	Aerial Photos Reviewed
ACU Site Investigations	
DP (Oct 2002)	1955, 65, 71, 79, 82, 87, 91, 97, 02
Dames & Moore (March 1996)	None
Dames & Moore (August 1996)	None
Rust (Feb 1995)	None
Rust (June 1995)	None
Adjoining Factory Site Investigations	
Rust (March 1995)	None
Rust (Sept 1994)	1951, 61, 71, 91

The two early aerial photos reviewed by Rust (1994), ie 1951 and 1961, were not available from the NRM Air Photo Library when DP prepared the October 2002 report. Further contact in January 2003 with the library found they were still not available, or are possible no longer in existence.

The 1961 photo reviewed by Rust (1994) had direct significance to the ACU site, where it was described that *"On the northern boundary (of the adjoining industrial site), a small amount of material appears to have migrated outside the site boundary into what is now ACU property..."* A sketch plan showing the boundary of the material presumed to be asbestos was included as Figure 3 in Rust (1994), however, the plan did not show the extent of any asbestos material on the ACU site.

The 1965 air photo was re-reviewed for this information response, and no white area appeared to extend over the common boundary with the industrial site, which was shown as a sharp line. However, the 1969 and 1971 photos both showed a blurred boundary between the two sites, indicating that the white areas extended into the ACU site by a few metres along some parts of its southern boundary. Photos from 1979 onwards showed a distinct boundary between the two sites, indicating that no loose white material extended across the boundary during this period.

In summary, aerial photos taken during the 1960s and 1971 showed an encroachment of white areas for a few metres inside the ACU property from the adjoining industrial site. Whether this encroachment was actually asbestos material is not definite.

9. Contaminant Testing

Fill that has been imported to the area has been tested for heavy metals and organochlorines (Section 3.3, Table 2 in Appendix B). However, no significantly elevated levels of these contaminants were found.

10. Laboratory Testing for Asbestos in Soil

Additional sampling and testing for asbestos in soil samples has been carried out for this information response, and results are described in Appendix B. In summary, 51 soil samples were tested, and asbestos was found in only four samples. Asbestos had also been visually observed in these four samples. It was not detected in any sample where it had not been visually observed in the same profile.

For a total of 14 samples, pieces of A/C sheeting were observed to be present in the soil profiles from which some samples were taken, but were not necessarily present in the sample of soil actually tested.

Generally, the results of the current laboratory testing were similar to results described in Table 3 of the Dames & Moore (1996) report, where field observations of asbestos in the soil correlated for only 28 samples of a total of 42 tested in a laboratory. In the D&M report, field observations were made that asbestos was not observed at 20 test locations, whilst laboratory tests of soil from six of those locations actually showed that some level of asbestos was present. However, three of those six tests showed "trace" levels only, which presumably cannot be detected by eye in the field.

None of the samples tested for this response showed asbestos to be present in the laboratory tests where no asbestos was observed in the same locations in the field.

In summary, the current data did not demonstrate a close correlation of laboratory testing to show the presence of asbestos in soil where none was observed in the field. These results may indicate that asbestos fibres are not prevalent in soil where the primary form of contaminant is A/C sheeting, which is a bonded form of asbestos. The current investigations indicated that careful field observations, either positive or negative for the occurrence of asbestos, are still a useful method of investigation.

11. Filling in the Southern Area

The following information about filling has been obtained from discussions with Mr Dermot Mallon, Manager Campus Operations, ACU.

Filling has been placed in several episodes over the last 8-10 years along the southeastern boundary area of ACU at various depths up to approximately 900 mm. The purpose of filling was to dispose of excess material, as well as to cover asbestos in the area.

Two sources of fill material were identified:

- Fill from excavations of virgin areas on the ACU site for foundations of new buildings; and
- Imported fill.

Mr Mallon was adamant that all fill material was clean when it was placed at the site, and could not explain how any fill could contain asbestos. However, investigations over the area have shown that some areas of the fill contain various amounts of asbestos material, mainly small pieces of A/C sheeting. This fill is proposed to be excavated during the current remediation works and disposed either into the containment cell or off-site to a licensed landfill. This remediation would be validated in the areas of the excavations to ensure that only clean soil remained.

13 and 14 Extent of Asbestos and Additional Investigations

The extent of asbestos and volumes of contaminated soil are described in more detail in Section 5.1 in Appendix B, and Drawing 3 in Appendix C of this response.

I trust that this response is adequate to fulfil the requirements of the information request. Please call if any clarification or additional information is required.

Yours faithfully,
DOUGLAS PARTNERS PTY LTD

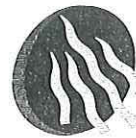
sch4p4(6) Personal information

Alan Lee
Senior Associate – Environment

APPENDIX A
EPA Letter of Request for Additional Information

Published on DES Disclosure Log
RTI Act 2009

Release



Queensland
Government

Enquiries Mark Paton
Telephone 07 3224 4514
Your reference
Our reference BNE9175

11 DEC 2002

Environmental Protection Agency

Incorporating the
Queensland Parks and Wildlife Service

10 December 2002

Mr Alan Lee
Douglas Partners Pty Ltd
439 Montague Road
WEST END QLD 4510

Dear Mr Lee

RE: Australian Catholic University Site – 53 Prospect Road, Mitchelton Queensland.

A contaminated land report relating to the above site was submitted by Helibronn Partners to the Environmental Protection Agency (EPA) as part of a Development Approval application. It is noted that the untitled contamination report is a Stage 1 Preliminary Site Investigation of the site. In order for a Remediation Action Plan and a Site Management Plan to be prepared, a comprehensive investigation of the site must be performed in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*.

The following additional items must be addressed or clarified so that the contaminated land aspects of the site can be assessed:

- 1 • Schedule 6, Part 2, 12(b) of the Environment Protection Regulation 1998 prescribes fees in relation to contaminated land. The fee required in relation to this investigation report is \$900.00 per lot. The report pertains to three lots listed as Lots 1 and 2 on RP 155212 and Lot 78 on RP 18783. An additional further fee payment of \$1800.00 is required.
- 2 • A complete bound report including title, date and signatures is required in accordance with section 6.2.1 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*. A partially scanned document is not acceptable. An objective section should also be included within the report.
- 3 • The location of Lots 1 and 2 on RP 155212 and Lot 78 on RP 18783 should be provided on a figure indicating the present site features (refer to Appendices 7.2.1 and 8.2 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).

- 4 • A figure showing the location of all sample points including all previous known investigations of the site should be included. Asbestos impacted areas based upon this complete data should be identified on the figure (refer to Appendix 8.3 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).
- 5 • Additional information is required in the test pit logs included as Appendix J. The use of generic terms such as “natural soil” and “clean fill” are not adequate (refer to section Appendix 8.3 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).
- 6 • Soil logs from both the present and previous investigations should be compiled. Representative cross sections of the site should then be prepared (refer to Appendix 8.3 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).
- 7 • Additional information is required in section 13.2.6 Geology. No geological information is provided regarding recent fluvial deposits along the creek. Information regarding soil types and the location, extent, quality and types of imported fill across the lots are required (refer to Appendix 7.2.4 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).
- 8 • The review of historical aerial photographs is limited. Additional, relevant and important information is contained within the Rust PPK 1994 report. This information should be referenced and included (1951, 1961, 1971 and 1991 photographs) to assist with the site history (refer to section 7.2.2 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998*).
- 9 • Previous investigations performed at the site have identified fill material with possible contaminants, other than asbestos, such as metals, ash and glass. Sampling and analysis of these locations for appropriate analytes should be performed. Representative sampling of both imported fill and natural soils should be analysed for arsenic due elevated natural levels in this area.
- 10 • The delineation of asbestos impact should be based upon both laboratory and field observation. The test pits No's. 6-19 and No's 21, 23, 25, 27 and 28 cannot be assumed to be free of asbestos without laboratory analysis of soil samples obtained at representative intervals within each test pit.
- 11 • Section 13.4.1 details that the south-eastern area of the site has been capped. Information regarding the remediation in this area, performed during the construction of a retaining wall should be provided (including the extent, depth and approximate

volume of asbestos material removed off site to the former James Hardie site. The location, extent, quality and types of fill used to cap the remediated area should be provided. Validation of the imported material will be required unless specific details of its source and placement can be detailed.

- 12 • If a validation report for the remediation and capping of the south eastern portion of the site has not been compiled, the asbestos impacted area of the site has not been adequately delineated. The asbestos impact west of Test Pit 1 (Douglas Partners, 2002) has not been defined. Information in the Rust PPK (1994) report (historical aerial photograph review and Figures 3 & 4) indicates that asbestos waste was deposited in the north western portion of the Wunderlich site. There is potential for impact in the south western portion of the investigation site. The asbestos impact is also likely to extend north of that indicated in Figure 2 (Douglas Partners, 2002). Results in the Rust PPK 1995 report (Figure 2), Rust PPK Letter dated 28 June 1995 (Figure 3) and the Dames & Moore 1996 report (Figure 1) all indicate that asbestos impact was present beyond this area.
- 13 • A brief site inspection was performed on 4 December 2002. Numerous locations with fibro-cement sheeting (possibly containing asbestos) at the surface were observed west and north of the proposed remediation area.
- 14 • Based upon information contained within the Dames & Moore 1996 report grid and observations made during the site inspection further sampling of the site is required to confirm that no other areas have been impacted by asbestos.

Please be advised that it is essential that contaminated land reports submitted to the EPA are of a high quality and meet the requirements of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, 1998* and the *National Environment Protection (Assessment of Site Contamination) Measure, 1999*. It is considered that the above mentioned report submitted to the EPA does not meet these requirements. Should you wish to discuss any of the matters raised in this letter, please do not hesitate to contact me on 3224 4514.

Yours sincerely

sch4p4(6) Personal information

Mark J Paton

Chief Scientific Advisor

cc. Heilbronn Partners
PO Box 113
SAMFORD QLD 4520

APPENDIX B

***DP Report – Further Contamination Investigations
and Laboratory Reports***

Published on DES Disclosure 1999
RTI Act 2009

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**REPORT ON
FURTHER CONTAMINATION INVESTIGATIONS,
AUSTRALIAN CATHOLIC UNIVERSITY,
53 PROSPECT ROAD, MITCHELTON**

1.0 INTRODUCTION

Further investigations were conducted at the above site to detail the extent of asbestos. The investigation included soil sampling and testing, and was conducted in accordance with the Department of Environment¹ *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (May 1998).

2.0 FIELD INVESTIGATION

The field investigation was carried out by Alan Lee, Environmental Consultant and Adam Lupton, Environmental Scientist, on 9, 10 and 13 January 2003, and comprised the following activities:

- Excavation of 25 test pits with a backhoe (TP 29-53) around the southern area of the site;
- Soil sampling at 3-4 levels within each test pit.

Test pits were located to assess contamination in the soil profile. Sampling locations are shown on Drawing No. 2 in Appendix C along with test locations of previous investigations. Each test pit was lithologically logged, and the subsurface conditions encountered and samples taken are described on the Test Bore Reports in Appendix C.

2.1 Ground Conditions

Subsurface conditions encountered at the site generally comprised a 0.3m silty sand filling layer, which, in some test pits, contained asbestos materials. Filling was underlain by natural soils of silty sands and clay. In test pits 41, 42 and 43, which were excavated to approximately 4.0 metres, there was a gradual change from silty clay to sandy clay moving deeper down the profile.

Test pits in natural ground generally comprised 0.4 m silty sand layer, which was underlain by a sandy silt layer to a maximum depth of 1.0m and then a silty clay layer which continued down the soil profile.

Test pits were discontinued between 0.55m and 4.1m in depth, and no groundwater was observed in any test pit during the investigation.

¹ Currently the Environmental Protection Agency (EPA)

2.2 Soil Sampling

Soil samples were collected at several layers in each test pit, including the top fill layer, the boundary between natural soil and the filling layer, and approximately 0.2 m intervals within the natural soil. Where no filling was encountered, samples were taken according to a change in soil type. Sampling intervals are shown on the Test Bore Reports in Appendix C.

To ensure the representativeness and integrity of the soil samples collected during this investigation, the samples were collected using disposable equipment and reusable stainless steel tools. To prevent cross contamination, the reusable implements were cleaned before each sampling episode.

3.0 LABORATORY TESTING OF SOIL SAMPLES

3.1 Laboratory Analyses

Fifty-one soil samples were selected and sent to laboratories at Parsons Brinkerhoff and Australian Laboratory Services, for the following analysis:

- Asbestos (51 samples);
- Heavy metals - arsenic, cadmium, chromium, copper, lead, nickel and zinc (four samples);
- Organics – organochlorines (four samples).

3.2 Regulatory Criteria

Analytical results have been compared to the former Queensland Department of Environment's (now EPA) *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, dated May 1998 (the 'Guidelines') Environmental Investigation Levels (EIL) and Health-based Investigation Levels for Exposure Setting 'E' – recreation, open space.

3.3 Laboratory Results – DP Samples

A summary of the laboratory results is given in Tables 1 and 2. Laboratory reports, chain of custody documentation and sample receipt advice are attached.

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Table 1 - Results of Laboratory Analysis (Soil Samples): Asbestos

Sample	Laboratory Results (Asbestos)	Field Observations
TP29-0.25m	No Asbestos Detected	3-5% ACS ¹ (<75mm)
TP29-0.45m	No Asbestos Detected	None observed
TP30-0.1m	No Asbestos Detected	None observed
TP30-0.3m	No Asbestos Detected	None observed
TP31-0.1m	No Asbestos Detected	1-3% ACS (<30mm)
TP31-0.3m	No Asbestos Detected	1-3% ACS (<30mm)
TP32-0.1m	No Asbestos Detected	None observed
TP32-0.95m	No Asbestos Detected	None observed
TP33-0.2m	Chrysotile and Amosite Asbestos	15-20% ACS (<150mm)
TP33-0.9m	No Asbestos Detected	None observed
TP34-0.05m	Chrysotile Asbestos	1-3% ACS (<25mm)
TP34-0.3m	No Asbestos Detected	None observed
TP35-0.05m	No Asbestos Detected	1-3% ACS
TP35-0.5m	No Asbestos Detected	None observed
TP36-0.1m	No Asbestos Detected	2% ACS
TP36-0.7m	No Asbestos Detected	None observed
TP37-0.15m	No Asbestos Detected	15-20% ACS
TP37-0.9m	No Asbestos Detected	None observed
TP38-0.05m	No Asbestos Detected	None observed
TP38-0.5m	No Asbestos Detected	None observed
TP39-0.1m	No Asbestos Detected	20% Limpit Asbestos
TP40-0.1m	No Asbestos Detected	None observed
TP40-0.2m	No Asbestos Detected	None observed
TP41-0.1m	No Asbestos Detected	None observed
TP41-1.0m	No Asbestos Detected	None observed
TP41A-0.1m	No Asbestos Detected	None observed
TP41A-0.5m	No Asbestos Detected	None observed
TP42-0.1m	No Asbestos Detected	None observed
TP42-0.45m	No Asbestos Detected	None observed
TP43-0.1m	No Asbestos Detected	2% ACS
TP43-1.0m	No Asbestos Detected	None observed
TP44-0.1m	Chrysotile Asbestos	5% ACS (<150mm)
TP44-0.55m	No Asbestos Detected	None observed
TP45-0.1m	No Asbestos Detected	None observed
TP45-0.4m	No Asbestos Detected	None observed
TP46-0.1m	Chrysotile, Crocidolite and Amosite Asbestos	5% ACS (<75mm)
TP46-0.9m	No Asbestos Detected	None observed
TP47-0.1m	No Asbestos Detected	None observed
TP47-0.4m	No Asbestos Detected	None observed
TP48-0.1m	No Asbestos Detected	None observed
TP48-0.3m	No Asbestos Detected	None observed
TP49-0.1m	No Asbestos Detected	1-3% ACS
TP49-1.0m	No Asbestos Detected	1-3% ACS

Table 1 continued next page

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Table 1(cont.)

Sample	Laboratory Results (Asbestos)	Field Observations
TP50-0.15m	No Asbestos Detected	None observed
TP50-0.45m	No Asbestos Detected	None observed
TP51-0.1m	No Asbestos Detected	None observed
TP51-0.5m	No Asbestos Detected	None observed
TP52-0.1m	No Asbestos Detected	None observed
TP52-0.5m	No Asbestos Detected	None observed
TP53-0.1m	No Asbestos Detected	None observed
TP53-0.4m	No Asbestos Detected	None observed

Note 1 Asbestos Cement Sheeting (ACS)

Table 2 – Results of Laboratory Analysis (Soil Samples): Metals and OC's

Sample	Analyte (mg/kg)							OC's
	Arsenic	Cadm.	Chrom.	Copper	Lead	Nickel	Zinc	
TP41-0.1 m	18	<1	18	12	24	4	31	<LOR
TP43-0.1 m	17	<1	12	16	59	5	60	<LOR
TP44-0.1m	24	<1	9	11	35	2	19	<LOR
TP46-0.1 m	12	<1	6	10	36	2	36	<LOR
EIL ¹	20	3	50	60	300	60	200	0.2
HBIL E ²	200	40	200	2000	600	600	14,000	Various ³

Notes 1 EPA's Environmental Investigation Level
 2 EPA's Health-based investigation Level Type E
 3 Various thresholds apply to individual compounds of OCs
 Shaded cells contain levels of an analyte greater than EIL
 <LOR Less than the laboratory's level of reporting

4.0 QUALITY ASSURANCE/QUALITY CONTROL

4.1 Quality Assurance

Quality assurance was maintained by:

- Compliance with a Project Quality Plan written for the objectives of the study;
- Using a qualified consultant to conduct the field investigation;
- Following the DP QA procedures for soil sampling, field testing and decontamination;
- Despatching samples using appropriate chain of custody procedures;
- Using a NATA registered laboratory for sample testing, which uses standard laboratory methods of USEPA and APHA.

4.2 Quality Control – Chemical Tests

Quality control of the laboratory analyses was achieved by the following means:

- Laboratory spikes: samples were spiked by the laboratory with a known concentration of contamination and subsequently tested for percent recovery;

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- Equipment blanks: the laboratory ran reagent blanks to confirm the equipment and standards used were uncontaminated.
- Duplicates: additional portions of a sample, which are analysed in exactly the same manner as all other samples.
- Surrogates: are similar compounds to the analytes being tested, which are added to samples to determine whether there has been any significant analyte loss at any stage of the laboratory analysis.

Results of all quality testing conducted by the laboratory are attached with the laboratory reports in *Attachment - Laboratory Reports*.

4.3 Quality Control Results – Chemical Tests

4.3.1 Laboratory Spikes

Laboratory spikes were analysed for each group of organic compounds and heavy metals. The spiked recovery percentages were within the acceptable range of 75-125% for metals and 60-140% for organics.

4.3.2 Laboratory Duplicates

Duplicate samples were analysed by ALS. The relative percent difference (RPD), which is the measure of precision between duplicate pairs of results, was calculated for each pair of samples. The RPD results were mainly in the range of <1% to 20%, which is an acceptable result. One RPD result for OC's was outside the recommended control limits, however, the exceedence was only minor.

4.3.3 Equipment Blanks

Equipment blanks samples were analysed for each group of organic compounds. All samples returned results lower than the laboratory detection limit of level of reporting, therefore are acceptable.

4.3.4 Surrogates

Surrogate samples were analysed for OC compounds by ALS. All surrogate recovery percentages for OC were in the range of 78% to 82%, which are acceptable results.

4.4 Summary of Quality Control

On the basis of the analytical data validation procedure employed by DP and ALS, as well as the quality assurance measures maintained, the quality of the soil analytical data produced is considered to be of an acceptable standard for interpretive use.

5.0 DISCUSSION OF RESULTS

Soil sampling and testing at the site targeted the fill layer and surface layer of natural soil. Asbestos cement sheeting was observed in the soil to a maximum depth of 1.0m. Asbestos fibres were also detected in samples TP33-0.2m, TP34-0.05m, TP44-0.1m and TP46-0.1m.

Heavy metals were all below the EPA threshold levels, except for a marginally elevated arsenic level found in sample TP44-0.1m (24 mg/kg) that was not considered to represent contamination.

OC levels were all below the laboratory's level of reporting.

Test locations have been coloured on Drawing No 2 according to whether asbestos was found at that location or not.

5.1 Location and Volume of Contaminated Soil

Asbestos contamination has been found by the current and previous investigations within the southern area of the ACU site. It is not known to exist on Lot 2 outside this area. Two situations of its occurrence have been found:

1. High concentrations of asbestos in the soil (20-80 percent) exist along the southern boundary. This area is a strip 3-10 metres wide for the full length of the boundary (200 metres), and is shown as Area F in Drawing No 3 in Appendix C. The source of this material appears to be over-spill from the adjoining industrial property;
2. Low concentrations of asbestos in the soil (<1 to 20 percent) have been found in fill material adjoining Area F as shown in Drawing No 3. This area is 10-20 metres wide out from the high concentration area. The source of this material appears to be from surface activities such as filling, mowing *etc*, which have spread the more highly concentrated contamination around the adjoining area.

Locations of soil at the site contaminated with asbestos are shown in Drawing Nos 3-5 in Appendix C, and volumes found in sub-areas on Drawing No 3 are estimated as follows. All volumes are *in-situ*.

Area A	176 m ³ (estimated average depth of contamination to be 0.7 metres)
Area B	817 m ³ (estimated average depth of contamination to be 0.8 metres)
Area C	Stockpile area for soil excavated from Areas A and B. Also includes 350 m ³ of fill containing asbestos (estimated average depth to be 0.7 metres)
Area D	Location of the containment cell.
Area E	Stockpile location for clean soil excavated from Area D to create the cell.
Area F	1,550 m ³ (estimated average depth of contamination to be 1-2 metres)
Area G	600 m ³ (estimated average depth of contamination to be 0.5 metres)
Area H	100 m ³ (estimated average depth of contamination to be 0.3 metres)
TOTAL	3,593 m³

6.0 CONCLUSIONS

Based on the findings of this investigation the following conclusions are made:

- Asbestos was observed predominantly as fill or as a contaminant within fill at various locations to a maximum depth of 1.0m;
- Asbestos fibres were detected in four samples in the top filling layer covering the site;
- Marginally elevated arsenic levels were detected in TP44-0.1m; and
- OC results were below the laboratory's level of reporting.

Remediation is proposed to consist of excavation of all asbestos contamination at the site and reburial in a containment cell in the proposed park area.

7.0 LIMITATION OF THIS REPORT

DP has performed investigation and consulting services for this project in accordance with current professional and industry standards for environmental site assessments. DP's assessment is necessarily based on limited site investigations and upon the restricted programme of surface and subsurface sample screening and chemical testing. Neither DP, nor any other reputable consultant, can provide unqualified warranties, nor does DP assume any liability for site conditions not observed, or inaccessible during the investigation.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, eg groundwater movement and/or spillages of contaminating substances. These changes may occur after DP's investigations and assessment.

The investigation addresses the likelihood of the presence of polluting, contaminating or hazardous substances within the substrate resulting from past and current known uses of the subject site. As a result, certain environmental characteristics at the site may not be revealed, *inter alia* these may include:

- Background levels of contaminants or toxins in the substrate including soils, rock, water and biomass on the site;
- Contaminants common in built or developed environments such as stored chemicals, raw materials, products and building materials; and
- Unauthorised or wanton site contamination such as illegal dumping and/or accidental spillage or inundation, which may occur following the site investigations by DP.

No site investigations can be thorough enough to provide absolute confirmation of the presence or absence of substances that may be considered contaminating, hazardous or polluting. Similarly the level of testing cannot be considered to unequivocally characterise the degree or extent of any contamination on the site. In addition regulatory or guideline criteria for the evaluation of soil and groundwater quality are frequently being reviewed and concentrations of contaminants which are considered acceptable in the present may in the future be considered to exceed or meet acceptance criteria. Similar conditions may prevail for site remediation standards as different regulatory mechanisms are developed and implemented.

This report and associated documentation and the information herein have been prepared solely for the use of Ariadne, Watpac and regulatory agencies, and any reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to DP.

DOUGLAS PARTNERS PTY LTD

Reviewed by:

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Adam Lupton
Environmental Scientist

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Alan Lee
Senior Associate - Environment



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ABN 84 797 323 433
NCSI Certified Quality System ISO 9001

Certificate of Analysis

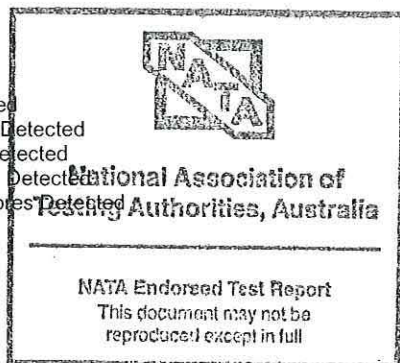
24 JAN 2003

CLIENT: Douglas Partners **JOB NO:** 136144A-010-152
CLIENT ADDRESS: 439 Montague Road, West End 4101 **DATE RECEIVED:** 15/01/2003
SAMPLED BY: As received **DATE OF TEST:** 16/01/2003
CONTACT: A Lupton
LOCATION: As supplied
TEST METHOD: Qualitative identification of asbestos types in bulk samples at Parsons Brinckerhoff Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Parsons Brinckerhoff in-house method No.1 and N.A.T.A accreditation No.9607. N.A.T.A. does not accredit sampling.

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M001	TP29 - 0.25m	Soil	N/A	NAD
M002	TP29 - 0.45m	Soil	N/A	NAD
M003	TP30 - 0.1m	Soil	N/A	NAD
M004	TP30 - 0.3m	Soil	N/A	NAD
M005	TP31 - 0.1m	Soil	N/A	NAD
M006	TP31 - 0.3m	Soil	N/A	NAD
M007	TP32 - 0.1m	Soil	N/A	NAD
M008	TP32 - 0.95m	Soil	N/A	NAD
M009	TP33 - 0.2m	Soil	N/A	CH, A
M010	TP33 - 0.9m	Soil	N/A	NAD
M011	TP34 - 0.05m	Soil	N/A	CH

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



Approved Identifier

Name: Michael Shepherd

Signature

sch4p4(6) Personal information

Approved Signatory

Name: Michael Shepherd

Signature

sch4p4(6) Personal information

AUTHOR'S

17/01/2003

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 1 of 5

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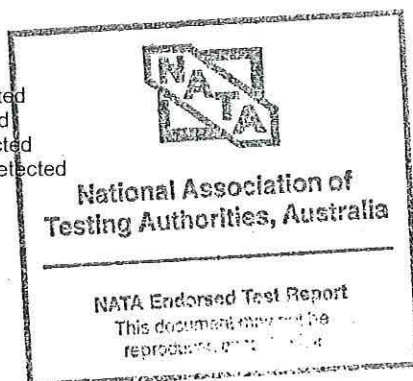
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CLIENT ADDRESS: 439 Montague Road, West End 4101
SAMPLED BY: As received
CONTACT: A Lupton
LOCATION: As supplied
TEST METHOD: Qualitative identification of asbestos types in bulk samples at Parsons Brinckerhoff Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Parsons Brinckerhoff in-house method No.1 and N.A.T.A accreditation No.9607. N.A.T.A. does not accredit sampling.

JOB NO: 136144A-010-152
DATE RECEIVED: 15/01/2003
DATE OF TEST: 16/01/2003

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M012	TP34 - 0.3m	Soil	N/A	NAD
M013	TP35 - 0.05m	Soil	N/A	NAD
M014	TP35 - 0.5m	Soil	N/A	NAD
M015	TP36 - 0.1m	Soil	N/A	NAD
M016	TP36 - 0.7m	Soil	N/A	NAD
M017	TP37 - 0.15m	Soil	N/A	NAD
M018	TP37 - 0.9m	Soil	N/A	NAD
M019	TP38 - 0.05m	Soil	N/A	NAD
M020	TP38 - 0.5m	Soil	N/A	NAD
M021	TP39 - 0.1m	Soil	N/A	NAD
M022	TP40 - 0.1m	Soil	N/A	NAD

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



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Name: Michael Shepherd

Signature

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Approved Signatory

Name: Michael Shepherd

Signature

AUTHOR

sch4p4(6) Personal information

17/01/20

another

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples, an independent analytical technique is advised due to the nature of the samples.

Page 2 of 5

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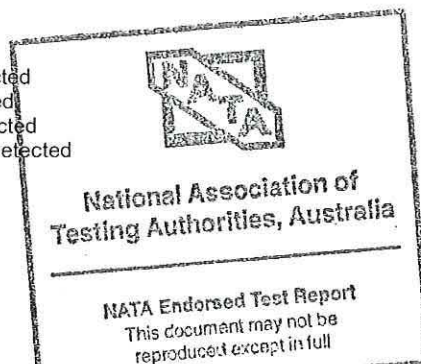
CLIENT: Douglas Partners
CLIENT ADDRESS: 439 Montague Road, West End 4101
SAMPLED BY: As received
CONTACT: A Lupton
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JOB NO: 136144A-010-152
DATE RECEIVED: 15/01/2003
DATE OF TEST: 16/01/2003

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M023	TP40 - 0.2m	Soil	N/A	NAD
M024	TP41 - 0.1m	Soil	N/A	NAD
M025	TP41 - 1.0m	Soil	N/A	NAD
M026	TP41A - 0.1m	Soil	N/A	NAD
M027	TP41A - 0.5m	Soil	N/A	NAD
M028	TP42 - 0.1m	Soil	N/A	NAD
M029	TP42 - 0.45m	Soil	N/A	NAD
M030	TP43 - 0.1m	Soil	N/A	NAD
M031	TP43 - 1.0m	Soil	N/A	NAD
M032	TP44 - 0.1m	Soil	N/A	CH
M033	TP44 - 0..55m	Soil	N/A	NAD

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



Approved Identifier

Name: Michael Shepherd

Signature

Approved Signature sch4p4(6) Personal information

Name: Michael

Signature

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NB: If no asbestos is detected in vinyls, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 3 of 5

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JOB NO: 136144A-010-152
DATE RECEIVED: 15/01/2003
DATE OF TEST: 16/01/2003

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M034	TP45 - 0.1m	Soil	N/A	NAD
M035	TP45 - 0.4m	Soil	N/A	NAD
M036	TP46 - 0.1m	Soil	N/A	CH, A, C
M037	TP46 - 0.9m	Soil	N/A	NAD
M038	TP47 - 0.1m	Soil	N/A	NAD
M039	TP47 - 0.4m	Soil	N/A	NAD
M040	TP48 - 0.1m	Soil	N/A	NAD
M041	TP48 - 0.3m	Soil	N/A	NAD
M042	TP49 - 0.1m	Soil	N/A	NAD
M043	TP49 - 0.1m	Soil	N/A	NAD
M044	TP50 - 0.15m	Soil	N/A	NAD

LEGEND

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C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



Approved Identifier

Name: Michael Shepherd

Signature

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17/01/2003

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 4 of 5

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Certificate of Analysis

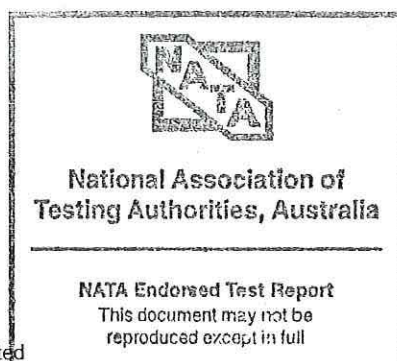
CLIENT: Douglas Partners
CLIENT ADDRESS: 439 Montague Road, West End 4101
SAMPLED BY: As received
CONTACT: A Lupton
LOCATION: As supplied
TEST METHOD: Qualitative identification of asbestos types in bulk samples at Parsons Brinckerhoff Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Parsons Brinckerhoff in-house method No.1 and N.A.T.A accreditation No.9607. N.A.T.A. does not accredit sampling.

JOB NO: 136144A-010-152
DATE RECEIVED: 15/01/2003
DATE OF TEST: 16/01/2003

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M045	TP50 - 0.45m	Soil	N/A	NAD
M046	TP51 - 0.1m	Soil	N/A	NAD
M047	TP51 - 0.5m	Soil	N/A	NAD
M048	TP52 - 0.1m	Soil	N/A	NAD
M049	TP52 - 0.5m	Soil	N/A	NAD
M050	TP53 - 0.1m	Soil	N/A	NAD
M051	TP53 - 0.4m	Soil	N/A	NAD

LEGEND

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C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



Approved Identifier

Name: Michael Shepherd

Signature

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Name

Signature

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NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 5 of 5

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22 JAN 2003

ALS Environmental



CERTIFICATE OF ANALYSIS

CONTACT: MR A LUPTON
CLIENT: DOUGLAS PARTNERS PTY LTD
ADDRESS:
439 MONTAGUE ROAD
WEST END QLD 4101
ORDER No.: 41481
PROJECT: 33292A

BATCH: EB51832
SUB BATCH: 0
LABORATORY: BRISBANE
DATE RECEIVED: 15/01/2003
DATE COMPLETED: 17/01/2003
SAMPLE TYPE: SOIL
No. of SAMPLES: 4

COMMENTS

Results apply to sample(s) as submitted. Samples as received digested by USEPA method 200.2 (modified) prior to the determination of metals. Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number. All pages of this report have been checked and approved for release.

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Signatory
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Newcastle
Auckland

Hong Kong
Singapore
Kuala Lumpur
Bogor
Mumbai

AMERICAS

Vancouver
Santiago
Antofagasta
Lima

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No. 825

Batch: EB51832
Sub Batch: 0
Date of Issue: 17/01/2003
Client: DOUGLAS PARTNERS PTY LTD
Client Reference: 33292A

CERTIFICATE OF ANALYSIS



				SAMPLE IDENTIFICATION							
		Laboratory I.D.		1	2	3	4				
		Date Sampled		09/01/2003	09/01/2003	09/01/2003	09/01/2003				
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	ACU TP41-	ACU TP43-	ACU TP44-	ACU TP46-				
				0.1m	0.1m	0.1m	0.1m				
EA-055	Moisture Content (dried @ 103°C)	%	0.1	10.4	6.9	12.0	12.4				
EG-005T	Arsenic - Total	mg/kg	1	18	17	24	12				
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1				
EG-005T	Chromium - Total	mg/kg	1	18	12	9	6				
EG-005T	Copper - Total	mg/kg	1	12	16	11	10				
EG-005T	Nickel - Total	mg/kg	1	4	5	2	2				
EG-005T	Lead - Total	mg/kg	1	24	59	35	36				
EG-005T	Zinc - Total	mg/kg	1	31	60	19	36				

Published on DES Disclosure Log
RTI Act 2009

Batch: EB51832
 Sub Batch: 0
 Date of Issue: 17/01/2003
 Client: DOUGLAS PARTNERS PTY LTD
 Client Reference: 33292A

QUALITY CONTROL REPORT



METHOD				SAMPLE IDENTIFICATION									
				Laboratory I.D.		200	201						
				Date Sampled		15/01/2003	15/01/2003						
				UNIT	LOR	Method Blank 1	Inorg 1 LCS % Rec						
CHECKS AND SPIKES													
EA-055	Moisture Content (dried @ 103°C)			%	0.1	----	----						
EG-005T	Arsenic - Total			mg/kg	1	<1	93.0%						
EG-005T	Cadmium - Total			mg/kg	1	<1	91.0%						
EG-005T	Chromium - Total			mg/kg	1	<1	94.0%						
EG-005T	Copper - Total			mg/kg	1	<1	98.0%						
EG-005T	Nickel - Total			mg/kg	1	<1	95.0%						
EG-005T	Lead - Total			mg/kg	1	<1	94.0%						
EG-005T	Zinc - Total			mg/kg	1	<1	97.0%						

Published on DES Disclosure Log
RTI Act 2009



CERTIFICATE OF ANALYSIS

CONTACT: MR A LUPTON
CLIENT: DOUGLAS PARTNERS PTY LTD
ADDRESS:
 439 MONTAGUE ROAD
 WEST END QLD 4101
ORDER No.: 41481
PROJECT: 33292A

BATCH: EB51832
SUB BATCH: 1
LABORATORY: BRISBANE
DATE RECEIVED: 15/01/2003
DATE COMPLETED: 17/01/2003
SAMPLE TYPE: SOIL
No. of SAMPLES: 4

COMMENTS

Results apply to sample(s) as submitted. Samples analysed on an as received basis. Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

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Signatory _____

sch4p4(6) Personal information

LABORATORIES

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 Singapore
 Kuala Lumpur
 Bogor
 Mumbai

AMERICAS

Vancouver
 Santiago
 Antofagasta
 Lima

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No. 825



Batch: EB51832
Sub Batch: 1
Date of Issue: 17/01/2003
Client: DOUGLAS PARTNERS PTY LTD
Client Reference: 33292A

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION							
				Laboratory I.D.	1	2	3	4			
				Date Sampled	09/01/2003	09/01/2003	09/01/2003	09/01/2003			
				UNIT	ACU TP41- 0.1m	ACU TP43- 0.1m	ACU TP44- 0.1m	ACU TP46- 0.1m			
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR								
EA-055	Moisture Content (dried @ 103°C)	%	0.1		10.4	6.9	12.0	12.4			
EP-068A-SS	ORGANOCHLORINE PESTICIDES										
EP-068A-SS	alpha-BHC	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	HCB	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	beta-BHC & gamma-BHC	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1			
EP-068A-SS	delta-BHC	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Heptachlor	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Aldrin	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Heptachlor epoxide	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Chlordane - trans	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Endosulfan 1	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Chlordane - cis	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Dieldrin	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	DDE	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Endrin	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Endosulfan 2	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	DDD	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Endrin aldehyde	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Endosulfan sulfate	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	DDT	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2			
EP-068A-SS	Endrin ketone	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05			
EP-068A-SS	Methoxychlor	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2			
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURROGATE										
EP-068S-SS	Dibromo-DDE	%	1		81	80	78	80			

Batch: EB51832
 Sub Batch: 1
 Date of Issue: 17/01/2003
 Client: DOUGLAS PARTNERS PTY LTD
 Client Reference: 33292A

QUALITY CONTROL REPORT



				SAMPLE IDENTIFICATION									
				Laboratory I.D.	200	406	407						
				Date Sampled	15/01/2003	15/01/2003	15/01/2003						
				Method	Blank 1	OCOPS1324 SCS % Rec	OCOPS1324 DCS % Rec						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103°C)	%	0.1	----	----	----							
EP-068A-SS	ORGANOCHLORINE PESTICIDES												
EP-068A-SS	alpha-BHC	mg/kg	0.05	<0.05	77.8%	86.0%							
EP-068A-SS	HCB	mg/kg	0.05	<0.05	79.7%	81.5%							
EP-068A-SS	beta-BHC & gamma-BHC	mg/kg	0.1	<0.1	83.3%	89.0%							
EP-068A-SS	delta-BHC	mg/kg	0.05	<0.05	101%	104%							
EP-068A-SS	Heptachlor	mg/kg	0.05	<0.05	82.8%	82.4%							
EP-068A-SS	Aldrin	mg/kg	0.05	<0.05	95.3%	97.8%							
EP-068A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	94.9%	89.9%							
EP-068A-SS	Chlordane - trans	mg/kg	0.05	<0.05	100%	93.2%							
EP-068A-SS	Endosulfan 1	mg/kg	0.05	<0.05	101%	101%							
EP-068A-SS	Chlordane - cis	mg/kg	0.05	<0.05	100%	93.2%							
EP-068A-SS	Dieldrin	mg/kg	0.05	<0.05	97.2%	94.1%							
EP-068A-SS	DDE	mg/kg	0.05	<0.05	92.9%	88.4%							
EP-068A-SS	Endrin	mg/kg	0.05	<0.05	89.2%	81.6%							
EP-068A-SS	Endosulfan 2	mg/kg	0.05	<0.05	115%	102%							
EP-068A-SS	DDD	mg/kg	0.05	<0.05	126%	114%							
EP-068A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	97.4%	94.8%							
EP-068A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	104%	94.1%							
EP-068A-SS	DDT	mg/kg	0.2	<0.2	77.9%	82.2%							
EP-068A-SS	Endrin ketone	mg/kg	0.05	<0.05	97.6%	95.8%							
EP-068A-SS	Methoxychlor	mg/kg	0.2	<0.2	72.6%	73.2%							
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURROGATE												
EP-068S-SS	Dibromo-DDE	%	1	78	82	81							



ORGANICS QUALITY CONTROL REPORT

BATCH No. EB51832

DATE BATCH RECEIVED : 14/01/03

CLIENT : Douglas Partners

DATE BATCH COMPLETED : 20/01/03

Where applicable, internal standards are added to sample extracts prior to instrumental analysis.
Absolute peak areas and retention times fall within the criteria specified in the individual methods.

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-068	Pesticides	Soil	Tumbler	USEPA 8270B	OCOPS1324	16/01/03	16/01/03

Published on DES Disclosure Log
RTI Act 2009

BATCH QUALITY CONTROL

ALS EP-068 : PESTICIDES

QC LOT No. : OCOPS1324
MATRIX: Soil

ANALYSIS 4p4 (6) Personal information

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
	mg/kg	mg/kg	SCS Conc	DCS Conc	Average Rec.	RPD	Rec.		RPD
			mg/kg	mg/kg	%	%	Low	High	%
EP-068A : ORGANOCHLORINE PESTICIDES									
a-BHC	<LOR	0.25	0.19	0.22	82	10	73	119	20
HCB	<LOR	0.25	0.20	0.20	81	2	75	118	20
b- & g-BHC	<LOR	0.50	0.42	0.44	86	7	79	114	20
d-BHC	<LOR	0.25	0.25	0.26	102	3	80	114	20
Heptachlor	<LOR	0.25	0.21	0.21	83	0	81	113	20
Aldrin	<LOR	0.25	0.24	0.24	97	3	82	115	20
Heptachlor epoxide	<LOR	0.25	0.24	0.22	92	5	76	118	20
trans-Chlordane	<LOR	0.25	0.25	0.23	97	7	79	115	20
Endosulfan 1	<LOR	0.25	0.25	0.25	101	1	75	126	20
cis-Chlordane	<LOR	0.25	0.25	0.23	97	7	81	115	20
Dieldrin	<LOR	0.25	0.24	0.24	96	3	76	120	20
DDE	<LOR	0.25	0.23	0.22	91	5	79	116	20
Endrin	<LOR	0.25	0.22	0.20	85	9	57	124	20
Endosulfan 2	<LOR	0.25	0.29	0.26	109	12	83	112	20
DDD	<LOR	0.25	0.31	0.28	120 *	10	86	110	20
Endrin aldehyde	<LOR	0.25	0.24	0.24	96	3	66	126	20
Endosulfan sulfate	<LOR	0.25	0.26	0.24	99	10	80	114	20
DDT	<LOR	0.25	0.19	0.21	80	5	76	116	20
Endrin ketone	<LOR	0.25	0.24	0.24	97	2	83	113	20
Methoxychlor	<LOR	0.25	0.18	0.18	73	1	67	124	20
EP-068B : ORGANOPHOSPHORUS PESTICIDES									
Dichlorvos	<LOR	0.25	0.20	0.19	79	5	67	125	20
Demeton-s-methyl	<LOR	0.25	0.21	0.21	84	3	61	131	20
Monocrotophos	<LOR	0.25	0.24	0.26	101	7	47	135	20
Dimethoate	<LOR	0.25	0.22	0.21	86	2	56	132	20
Diazinon	<LOR	0.25	0.24	0.25	98	3	47	149	20
Chlorpyrifos methyl	<LOR	0.25	0.25	0.22	94	15	82	114	20
Parathion methyl	<LOR	0.25	0.24	0.23	94	1	75	121	20
Malathion	<LOR	0.25	0.25	0.26	102	5	79	117	20
Fenthion	<LOR	0.25	0.25	0.24	98	2	81	114	20
Chlorpyrifos	<LOR	0.25	0.26	0.26	104	2	83	113	20
Parathion	<LOR	0.25	0.24	0.23	95	2	80	114	20
Pirimiphos ethyl	<LOR	0.25	0.24	0.25	99	4	32	162	20
Chlorfenvinphos E	<LOR	0.25	N/A	N/A	N/A		--	--	
Chlorfenvinphos Z	<LOR	0.25	0.27	0.26	105	3	73	121	20
Bromophos ethyl	<LOR	0.25	0.25	0.23	96	6	84	112	20
Fenamiphos	<LOR	0.25	0.27	0.22	99	18	66	128	20
Prothiofos	<LOR	0.25	0.26	0.25	102	7	81	113	20
Ethion	<LOR	0.25	0.27	0.21	96	22 *	79	116	20
Carbofenthion	<LOR	0.25	0.25	0.28	106	12	80	116	20
Azinphos methyl	<LOR	0.25	0.22	0.24	93	8	62	132	20
EP-068C : TRIAZINE PESTICIDES									
Simazine	<LOR	0.25	0.19	0.22	82	19	1	148	20
Atrazine	<LOR	0.25	0.20	0.22	84	8	48	143	20
EP-068D : SYNTHETIC PYRETHROIDS									
Cypermethrins	<LOR	0.25	0.22	0.22	88	1	69	126	20

COMMENTS:

- 1) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)
- 2) * : Recovery or RPD falls outside of the recommended control limits.

CHAIN OF CUSTODY DOCUMENTATION NO. 8

Australian Laboratory
Services Pty Ltd

CLIENT: DOUGLAS PARTNERS

POSTAL ADDRESS: 439 MONTAGUE ROAD, WEST END QLD 4101

SEND REPORT TO: ADAM LUPTON

SEND INVOICE TO: ADAM LUPTON

DATA NEEDED BY: 17-01-03

REPORT NEEDED BY: 21-01-03

LABORATORY BATCH NO:

SAMPLERS: ADAM LUPTON

PHONE: 3237 8900 FAX: 3237 8999 E-MAIL: luptona@douglaspartners.com.au

REPORT FORMAT: HARD: ☒

FAX: ☒

DISK: ☐

BULLETIN BOARD: ☐

E-MAIL: ☐

PROJECT ID: 33292A

QUOTE NO.: EN 307 00

P.O. NO.: 41481

COMMENTS/SPECIAL HANDLING/STORAGE OR DIPOSAL:

FOR LAB USE ONLY

COOLER SEAL

Yes No

Broken Intact

COOLER TEMP: deg.C

QC LEVEL:

QCS1: ☐

QCS2: ☐

QCS3: ☐

QCS4: ☐

ANALYSIS REQUIRED

As, Cd, Cu, Cr

Pb, Zn, Ni

OC's

NOTES

SAMPLE DATA

CONTAINER DATA

SAMPLE ID

MATRIX

DATE

TIME

TYPE & PRESERVATIVE

NO.

Ph

ACU TP41-0.1m (1)

soil

9-Jan

ACU TP43-0.1m (2)

soil

9-Jan

ACU TP44-0.1m (3)

soil

9-Jan

ACU TP46-0.1m (4)

soil

9-Jan

RELINQUISHED BY:

NAME: Adam Lupton

sch4p4(6) Personal information

DATE: 14-1-03

OF: Douglas Partners

TIME: 14.30

NAME:

DATE:

OF:

TIME:

sch4p4(6) Personal information

DATE: 14/1/03

OF: A/S SAMPLE RECEIPT

NAME:

DATE:

OF:

TIME:

METHOD OF SHIPMENT

CONSIGNMENT NOTE NO.

TRANSPORT CO. NAME.

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle;

VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle;

O = Other.

AUSTRALIAN LABORATORY SERVICES P/L

17 01 03
URGENT



TO: DOUGLAS PARTNERS PTY LTD

439 MONTAGUE ROAD
WEST END QLD 4101

ATTENTION: MR A LUPTON

SUBJECT: Analytical results.

BATCH: EB51832-0

DATE: 17/01/03

Published on DES Disclosure Log
RTI Act 2009

AUSTRALIAN LABORATORY SERVICES P/L
ABN: 84 009 936 029

ISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449



DOUGLAS PARTNERS PTY LTD

Attention: MR A LUPTON
 YourOrder: 41481
 SampleType: SOIL
 Project: 33292A

Page-no: 1
 ENV BRISBANE
 Batch-no: 51832
 Sub-batch: 0
 No-samples: 4
 Received: 15/01/03
 Checked:

Method	Analysis description	Units	LOR	ACU TP41- 0.1m 09/01/03	ACU TP43- 0.1m 09/01/03	ACU TP44- 0.1m 09/01/03
EA-055	Moisture Content (dried @ 103° C)	%	0.1	10.4	6.9	12.0
EG-005T	Arsenic - Total	mg/kg	1	18	17	24
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	18	12	9
EG-005T	Copper - Total	mg/kg	1	12	16	11
EG-005T	Nickel - Total	mg/kg	1	4	5	2
EG-005T	Lead - Total	mg/kg	1	24	59	35
EG-005T	Zinc - Total	mg/kg	1	31	60	19

Results apply to sample(s) as submitted. Samples as received digested by USEPA method 200.2 (modified) prior to the determination of metals. Results reported on a dry weight basis.

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
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Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

Release



DOUGLAS PARTNERS PTY LTD

Attention: MR A LUPTON
 Your Order: 41481
 Sample Type: SOIL
 Project: 33292A

Page-no: 2
 ENV BRISBANE
 Batch-no: 51832
 Sub-batch: 0
 No-samples: 4
 Received: 15/01/03
 Checked:

Method	Analysis description	Units	LOR	ACU TP46-
				0.1m
				09/01/03
1-055	Moisture Content (dried @ 103°)	%	0.1	12.4
EG-005T	Arsenic - Total	mg/kg	1	12
EG-005T	Cadmium - Total	mg/kg	1	<1
1-005T	Chromium - Total	mg/kg	1	6
1-005T	Copper - Total	mg/kg	1	10
EG-005T	Nickel - Total	mg/kg	1	2
EG-005T	Lead - Total	mg/kg	1	36
1-005T	Zinc - Total	mg/kg	1	36

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
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Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449



TO: DOUGLAS PARTNERS PTY LTD

439 MONTAGUE ROAD
WEST END QLD 4101

ATTENTION: MR A LUPTON

SUBJECT: Analytical results.

BATCH: EB51832-1

DATE: 17/01/03

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

SYDNEY
Tel: 61-2-8784 8555
Fax: 61-2-8784 8500

MELBOURNE
Tel: 61-3-9538 4444
Fax: 61-3-9538 4400

NEWCASTLE
Tel: 61-2-4968 9433
Fax: 61-2-4968 0349

AUCKLAND
Tel: 64-9-379 9437
Fax: 64-9-379 1449



DUGLAS PARTNERS PTY LTD

Attention: MR A LUPTON

Your Order: 41481

Sample Type: SOIL

Project: 33292A

Page-no: 1

ENV BRISBANE

Batch-no: 51032

Sub-batch: 1

No-samples: 4

Received: 15/01/03

Checked:

Method	Analysis description	Units	LOR	ACU TP41- 0.1m 09/01/03	ACU TP43- 0.1m 09/01/03	ACU TP44- 0.1m 09/01/03
EA-055	Moisture Content (dried @ 103°)	%	0.1	10.4	6.9	12.0
EP-060A-SS	ORGANOCHLORINE PESTICIDES					
-060A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	HCB	mg/kg	0.05	<0.05	<0.05	<0.05
EP-060A-SS	beta-BHC & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
EP-060A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
EP-060A-SS	Chlordane - trans	mg/kg	0.05	<0.05	<0.05	<0.05
EP-060A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Chlordane - cis	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
EP-060A-SS	DDE	mg/kg	0.05	<0.05	<0.05	<0.05
EP-060A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
P-060A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
P-060A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
-060A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
-060A-SS	Endrin ketone	mg/kg	0.05	<0.05	<0.05	<0.05
P-060A-SS	Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.2
P-060S-SS	ORGANOCHLORINE PESTICIDE SURRO					
-060S-SS	Dibromo-DDE		1	81	80	78

Results apply to sample(s) as submitted. Samples analysed on an as received basis. Results reported on a dry weight basis.

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449



DOUGLAS PARTNERS PTY LTD

Attention: MR A LUPTON
 YourOrder: 41481
 SampleType: SOIL
 Project: 33292A

Page-no: 2
 ENV BRISBANE
 Batch-no: 51832
 Sub-batch: 1
 No-samples: 4
 Received: 15/01/03
 Checked:

Method	Analysis description	Units	LOR	ACU TP46- 0.1m 09/01/03
EP-055	Moisture Content (dried @ 103° C)	%	0.1	12.4
EP-068A-SS	ORGANOCHLORINE PESTICIDES			
EP-068A-SS	alpha-BHC	mg/kg	0.05	<0.05
EP-068A-SS	HCB	mg/kg	0.05	<0.05
EP-068A-SS	beta-BHC & gamma-BHC	mg/kg	0.1	<0.1
EP-068A-SS	delta-BHC	mg/kg	0.05	<0.05
EP-068A-SS	Heptachlor	mg/kg	0.05	<0.05
EP-068A-SS	Aldrin	mg/kg	0.05	<0.05
EP-068A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05
EP-068A-SS	Chlordane - trans	mg/kg	0.05	<0.05
EP-068A-SS	Endosulfan 1	mg/kg	0.05	<0.05
EP-068A-SS	Chlordane - cis	mg/kg	0.05	<0.05
EP-068A-SS	Dieldrin	mg/kg	0.05	<0.05
EP-068A-SS	DDE	mg/kg	0.05	<0.05
EP-068A-SS	Endrin	mg/kg	0.05	<0.05
EP-068A-SS	Endosulfan 2	mg/kg	0.05	<0.05
EP-068A-SS	DDD	mg/kg	0.05	<0.05
EP-068A-SS	Endrin aldehyde	mg/kg	0.05	<0.05
EP-068A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2
EP-068A-SS	Endrin ketone	mg/kg	0.05	<0.05
EP-068A-SS	Methoxychlor	mg/kg	0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO			
EP-068S-SS	Dibromo-DDE	%	1	80

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

RISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

Release

CHAIN OF CUSTODY DOCUMENTATION NO. 8

Australian Laboratory
Services Pty Ltd

CLIENT: DOUGLAS PARTNERS

LABORATORY BATCH NO.:

POSTAL ADDRESS: 439 MONTAGUE ROAD, WEST END QLD 4101

SAMPLERS: ADAM LUPTON

SEND REPORT TO: ADAM LUPTON

SEND INVOICE TO: ADAM LUPTON

PHONE: 3237 8900 FAX: 3237 8999 E-MAIL: luptona@douglaspartners.com.au

DATA NEEDED BY: 17-01-03

REPORT NEEDED BY: 21-01-03

REPORT FORMAT: HARD: ☒ FAX: ☒ DISK: ☐ BULLETIN BOARD: ☐ E-MAIL: ☐

PROJECT ID: 33292A

QUOTE NO.: EN 307 00

P.O. NO.: 41481

COMMENTS/SPECIAL HANDLING/STORAGE OR DIPOSAL:

FOR LAB USE ONLY

COOLER SEAL

Yes

No

Broken

Intact

COOLER TEMP: deg.C

QC LEVEL: QCS1: ☐ QCS2: ☐ QCS3: ☐ QCS4: ☐

ANALYSIS REQUIRED

As, Cd, Cu, Cr

Pb, Zn, Ni

OC's

NOTES

SAMPLE DATA

CONTAINER DATA

SAMPLE ID

MATRIX

DATE

TIME

TYPE & PRESERVATIVE

NO.

Ph

ACU TP41-0.1m

soil

9-Jan

ACU TP43-0.1m

soil

9-Jan

ACU TP44-0.1m

soil

9-Jan

ACU TP46-0.1m

soil

9-Jan

RELINQUISHED BY:

RECEIVED BY

METHOD OF SHIPMENT

NAME: Adam Lupton sch4p4(6) Personal information

DATE: 14-1-03

NAME:

DATE:

CONSIGNMENT NOTE NO.

OF: Douglas Partners

TIME: 16.30

OF:

TIME:

NAME:

DATE:

NAME:

DATE:

TRANSPORT CO. NAME.

OF:

TIME:

OF:

TIME:

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle;

VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle;

O = Other.

AUSTRALIAN LABORATORY SERVICES P/L



SAMPLE RECEIPT ADVICE

COMPANY: DOUGLAS PARTNERS PTY LTD
ATTENTION: MR A LUPTON
DATE: Jan. 16, 2003
FROM: Jason Nye, ENV BRISBANE

ALS has received samples pertaining to your reference: 33292A

For future reference the batch number on this order is: EB51832

All samples and paper work were received in good order.
Samples have been received within recommended holding times.
Samples chilled when received.
Samples received in appropriately pretreated and preserved containers.
Please direct any turnaround/technical queries to Geoff LeCornu.
Any queries relating to sample condition/numbering/breakages should
be directed to Jason Nye.
All aqueous samples are stored for two weeks and solid samples for
three months from the date of completion of the batch, unless specific
arrangements are made otherwise.

Purchase Order Number: 41481

You can expect results to be reported as detailed below:

All Environmental Results Jan. 17, 2003

Comments: Samples received 14/01/03.

A L S - SERVICING YOUR NEEDS BETTER

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

APPENDIX C

Drawing No. 1 – Site Plan

Drawing No. 2 – Test Locations Plan

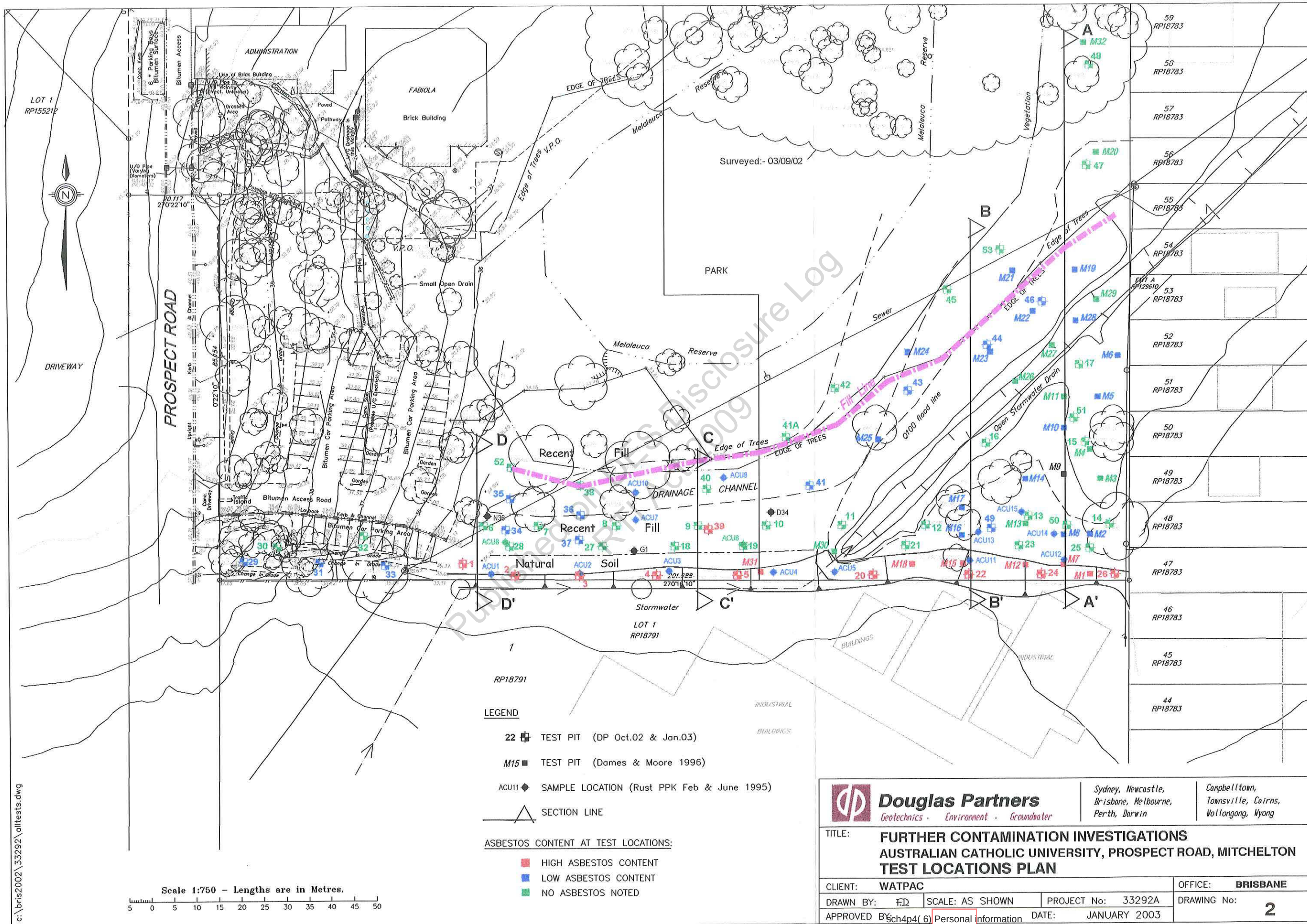
Drawing No. 3 – Areas of Contaminated Soil and Containment Cell

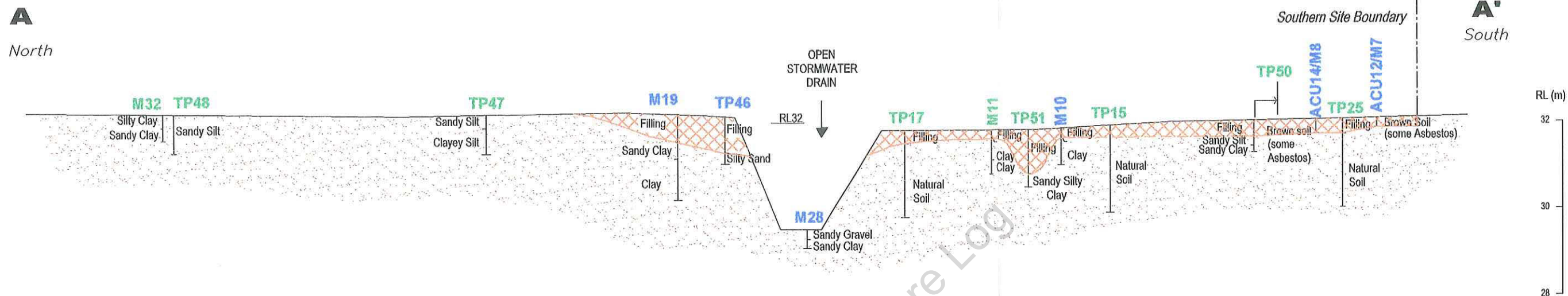
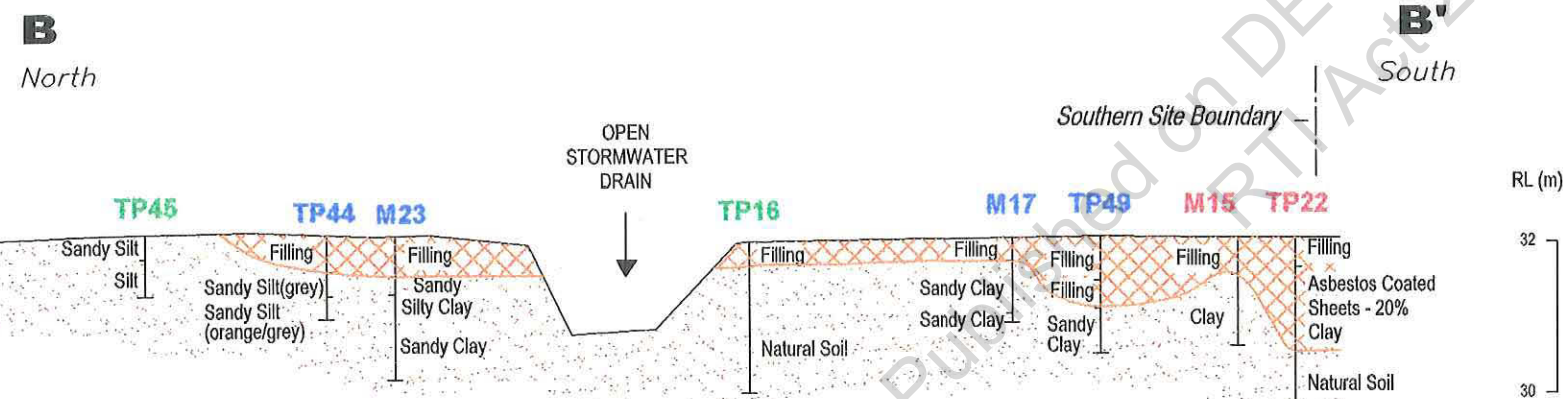
Drawing No. 4 – Cross Sections A-A¹, B-B¹

Drawing No. 5 – Cross Sections C-C¹, D-D¹

Published on DES Disclosure Log
RTI Act 2009

Release

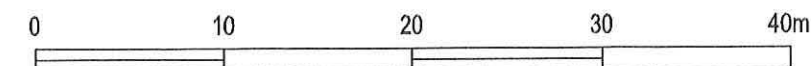




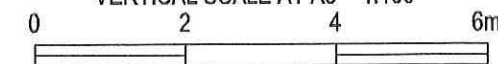
LEGEND

-  FILLING
-  NATURAL SOIL
-  HIGH ASBESTOS CONTENT
-  LOW ASBESTOS CONTENT
-  NO ASBESTOS NOTED

HORIZONTAL SCALE AT A3 = 1:400



VERTICAL SCALE AT A3 = 1:100



SCALE RATIO = 1V:4H



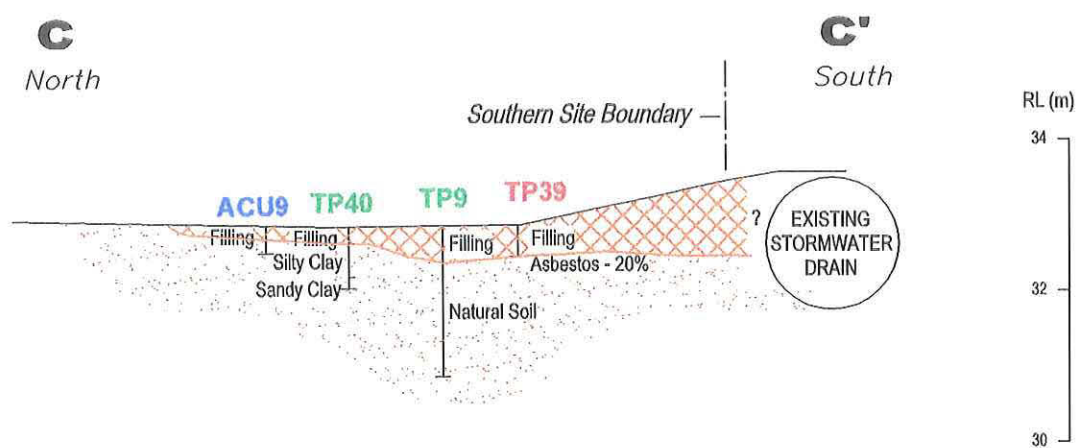
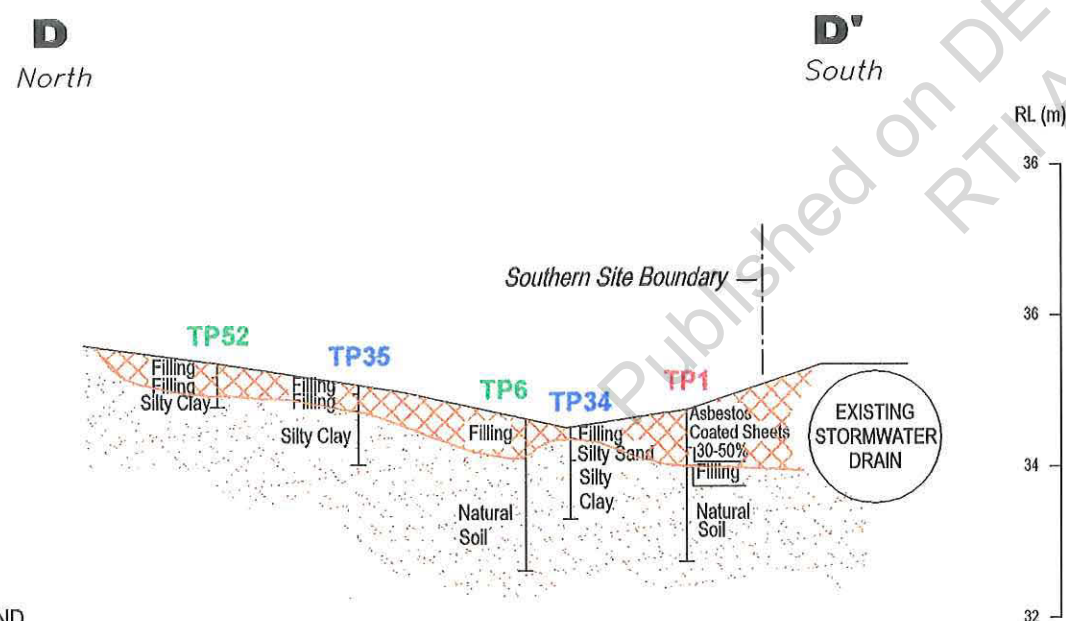
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Sydney, Newcastle,
Brisbane, Melbourne,
Perth, Darwin

Campbelltown,
Townsville, Cairns,
Wollongong, Wyong

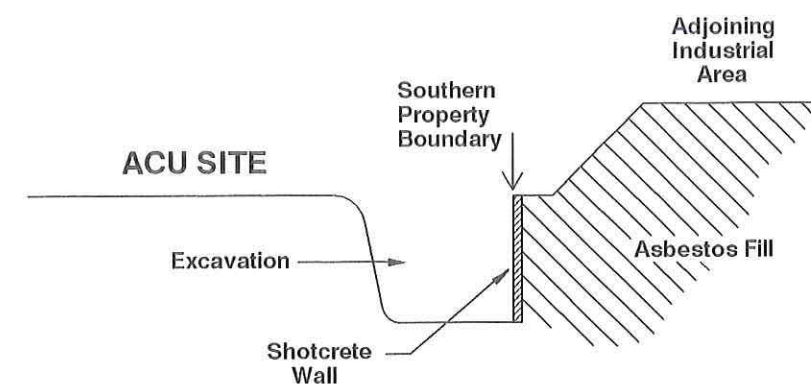
TITLE: **FURTHER CONTAMINATION INVESTIGATIONS
AUSTRALIAN CATHOLIC UNIVERSITY, PROSPECT ROAD, MITCHELTON
CROSS SECTIONS A-A', B-B'**

CLIENT: WATPAC	OFFICE: BRISBANE
DRAWN BY: FD	DRAWING No: 4
APPROVED BY:	PROJECT No: 33292A
DATE: JANUARY 2003	



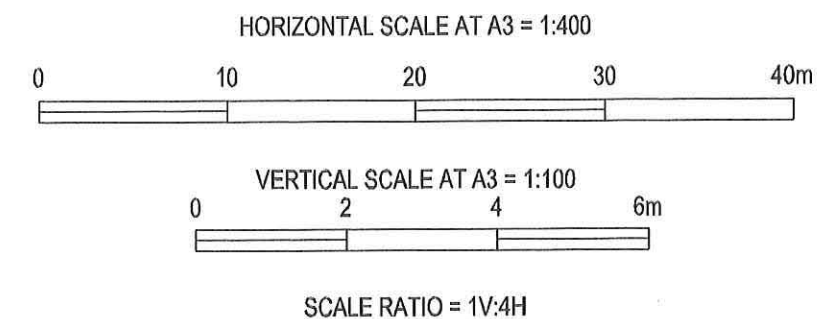
LEGEND

- FILLING
- NATURAL SOIL
- HIGH ASBESTOS CONTENT
- LOW ASBESTOS CONTENT
- NO ASBESTOS NOTED



Shotcrete along a below-ground retaining wall to hold back asbestos fill under the adjacent industrial property

CROSS SECTION ALONG ACU SOUTHERN BOUNDARY DIAGRAMMATIC - NOT TO SCALE



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Townsville, Cairns,
Wollongong, Wyong

TITLE: **FURTHER CONTAMINATION INVESTIGATIONS
AUSTRALIAN CATHOLIC UNIVERSITY, PROSPECT ROAD, MITCHELTON
CROSS SECTIONS C-C', D-D'**

CLIENT: WATPAC	OFFICE: BRISBANE
DRAWN BY: FD SCALE: AS SHOWN	PROJECT No: 33292A
APPROVED BY:	DATE: JANUARY 2003
DRAWING No: 5	

APPENDIX D

Compiled Test Pit Reports

- DP (2003)
 - DP (2002)
 - D&M (1996)
 - Rust PPK (1994)
-

Published on DES Disclosure Log
RTI Act 2009

Release

TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 29

SURFACE LEVEL:

0.4	FILLING - light brown silty sand with gravel to 75mm, contains A/C sheeting up to 100mm (3-5%)		D	0.25		
	SILTY CLAY - red-brown silty clay		D	0.45		
			D	0.65		
1.0	PIT DISCONTINUED AT 1.01m DEPTH		D	1.00		

DES Disclosure Log
2009

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 30

SURFACE LEVEL:

0.15	FILLING - dark grey-brown sandy silt (topsoil)		D	0.10		
	SILTY SAND - light brown silty sand		D	0.30		
0.50	SILTY CLAY - red-brown silty clay		D	0.50		
0.70	SHALE/ROCK (Neranleigh-Fernvale?) - grey-white weathered shale/rock					
0.75						
	PIT DISCONTINUED AT 0.75m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p416 Personal information

Date: 24-1-03

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

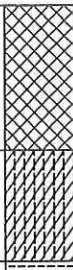
PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 31

SURFACE LEVEL:

0.45 0.80 0.85	FILLING - dark grey-brown sandy silt (topsoil), contains A/C sheeting to 30mm (1-3%) to 0.15m, then light brown silty sand with gravel		D	0.10		
			D	0.30		
	SILTY CLAY - red-brown silty clay		D	0.50		
	SHALE/ROCK (Neranleigh-Fernvale?) - grey-white weathered shale/rock		D	0.80		
	PIT DISCONTINUED AT 0.85m DEPTH					
GROUNDWATER OBSERVATIONS: No free groundwater encountered.						

PIT No: 32

SURFACE LEVEL:

0.65 0.80 1.00	FILLING - bitumen hardstand in Carpark No.37 to 20mm, then roadbase gravel to 0.65m		D	0.10		
			D	0.65		
	FILLING - light brown silty sand with gravel		D			
	SILTY CLAY - red-brown silty clay		D	0.95		
	PIT DISCONTINUED AT 1.00m DEPTH					
GROUNDWATER OBSERVATIONS: No free groundwater encountered.						

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample pp Pocket Penetrometer (kPa)
 B Bulk sample PID Photo Ionisation Detector
 D Disturbed sample Ux x mm dia. tube
 M Moisture content (%) Wp Plastic limit

CHECKED

sch4p4(6) Personal information

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 33

SURFACE LEVEL:

	FILLING - dark grey-brown sandy silt (topsoil) with A/C sheeting (15-20%) to 150mm, then light brown silty sand with A/C sheeting (15-20%) up to 200mm		D	0.20		
0.45	FILLING - light brown silty sand (no apparent A/C sheeting)		D	0.50		
0.80	SILTY CLAY - red-brown silty clay		D	0.90		
0.95	PIT DISCONTINUED AT 0.95m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 34

SURFACE LEVEL:

0.10	FILLING - light red-brown/brown fine to medium gravelly clay, trace A/C sheeting (1-3%) up to 25mm		D	0.05		
0.30	SILTY SAND - light brown silty sand		D	0.30		
	SILTY CLAY - red-brown silty clay		D	0.55		
1.2	PIT DISCONTINUED AT 1.20m DEPTH		D	1.20		

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch40116: Personal Information

Date: 24-1-03

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 35

SURFACE LEVEL:

0.10	FILLING - dark grey-brown sandy silt (topsoil) with some A/C sheeting (1-3%)		D	0.05		
0.35	FILLING - light brown silty sand		D	0.30		
	SILTY CLAY - red-brown silty clay		D	0.50		
			D	1.00		
1.10	PIT DISCONTINUED AT 1.10m DEPTH.					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 36

SURFACE LEVEL:

0.30	FILLING - dark grey-brown sandy silt (topsoil) with some A/C sheeting (2%) and bricks (10%)		D	0.10		
	FILLING - light brown silty sand		D	0.50		
0.65	SILTY CLAY - red-brown silty clay		D	0.70		
			D	1.00		
1.05	PIT DISCONTINUED AT 1.05m DEPTH.					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch 4416 Personal information

Date: 26-1-03

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 37

SURFACE LEVEL:

0.50	FILLING - brown-grey silty sand with some gravel and A/C sheeting (15-20%)		D	0.15		
			D	0.30		
0.85	FILLING - orange mottled grey silty clay with A/C sheeting (5-10%)					
	SILTY CLAY - red-orange silty clay		D	0.90		
1.20	PIT DISCONTINUED AT 1.20m DEPTH		B	1.20		

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 38

SURFACE LEVEL:

0.05	FILLING - cream-orange, highly weathered shale / gravelly clay		D	0.05		
	FILLING - dark grey gravelly sandy silt		D	0.20		
0.50	SILTY CLAY - red-brown silty clay		D	0.50		
0.85	PIT DISCONTINUED AT 0.85m DEPTH		D	0.80		

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample pp Pocket Penetrometer (kPa)
 B Bulk sample PID Photo Ionisation Detector
 D Disturbed sample Ux x mm dia. tube
 M Moisture content (%) Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Initials:

Date:

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 39

SURFACE LEVEL:

0.40	FILLING - light grey loamy sandy gravel - A/C sheeting and white/blue fibrous sheeting (20%)		D	0.10		
	PIT DISCONTINUED AT 0.40m DEPTH (became too hazardous to continue)					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 40

SURFACE LEVEL:

0.20	FILLING - orange gravelly clay		D	0.10		
	SILTY CLAY - dark grey silty clay with organic matter		D	0.20		
0.60	SANDY CLAY - orange mottled sandy clay		D	0.70		
0.75	PIT DISCONTINUED AT 0.75m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Date: 24-1-03
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 9 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 41A

SURFACE LEVEL:

0.20	SILTY SAND - dark grey silty sand; surface water		D	0.10		
	SILTY SAND - orange-yellow silty sand; more sand with depth		D	0.50		
0.85			D	0.80		
1	PIT DISCONTINUED AT 0.85m DEPTH					
2						
3						
GROUNDWATER OBSERVATIONS: No free groundwater encountered.						

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 41

SURFACE LEVEL:

0.30	FILLING - red-brown gravelly clay		D	0.10		
	FILLING - grey silty clay with orange mottling, with A/C sheeting (5-10%)		D	0.45		
0.80	SILTY CLAY - dark grey silty clay with red-brown mottling		D	1.00		
1.20	SILTY CLAY - creamy silty clay, becoming more sandy with depth		D	1.30		
4.10	PIT DISCONTINUED AT 4.10m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND	
A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

sch404(6). Personal Information

Initials: [Redacted]

Date: 24-1-03

File C





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TEST PIT REPORT

CLIENT: WATPAC

DATE: 10 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 42

SURFACE LEVEL:

0.40	SILTY SAND - dark grey silty sand	+++++	D	0.10		
	SILTY CLAY - grey mottled yellow silty clay	+++++	D	0.45		
		+++++	D	0.85		
1.40	SILTY CLAY - grey mottled red silty clay					
2.5	SILTY CLAY - grey mottled yellow-brown silty clay					
4.0	PIT DISCONTINUED AT 4.00m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 43

SURFACE LEVEL:

0.20	FILLING - brown silty sand with some A/C sheeting (2%)	+++++	D	0.10		
	FILLING - brown silty sand with some gravel and some A/C sheeting (>10%)	+++++	D	0.55		
0.90	SILTY SAND - light grey silty sand	+++++	D	1.00		
1.30	SILTY CLAY - grey mottled brown silty clay	+++++	D	1.50		
2.00	SILTY CLAY - grey mottled red-brown silty clay					
3.5	PIT DISCONTINUED AT 3.50m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(16) Personal information

Date: 24-1-03

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 10 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 44

SURFACE LEVEL:

	FILLING - light brown sandy clay with A/C sheeting to 150mm (5%)		D	0.10		
0.50	SANDY SILT - light grey sandy silt		D	0.55		
0.80	SANDY SILT - orange mottled grey sandy silt		D	1.00		
1.10	PIT DISCONTINUED AT 1.10m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 45

SURFACE LEVEL:

	SANDY SILT - dark grey sandy silt (Natural)		D	0.10		
0.30	SANDY SILT - brown-orange sandy silt		D	0.40		
0.80			D	0.70		
	PIT DISCONTINUED AT 0.80m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample
B Bulk sample
D Disturbed sample
M Moisture content (%)
pp Pocket Penetrometer (kPa)
PID Photo Ionisation Detector
Ux x mm dia. tube
Wp Plastic limit

CHECKED

sch4466 Personal information

Date: 24/1/03

File C



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Page 59 of 107

TEST PIT REPORT

CLIENT: WATPAC

DATE: 10 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 46

SURFACE LEVEL:

0.20	FILLING - light brown clayey sand with A/C sheeting to 75mm (5%)		D	0.10		
	FILLING - grey red-orange mottled clayey silt with A/C sheeting (1%)		D	0.30		
			D	0.60		
0.85	SILTY SAND - light yellow silty sand with orange mottling (Natural)		D	0.90		
1.10	PIT DISCONTINUED AT 1.10m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 47

SURFACE LEVEL:

0.30	SANDY SILT - light grey sandy silt		D	0.10		
	CLAYEY SILT - orange-brown clayey silt		D	0.40		
			D	0.80		
0.90	PIT DISCONTINUED AT 0.90m DEPTH					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Initials:

Date:

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 10 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 48

SURFACE LEVEL:

PIT NO. 10					
0.30	SILTY SAND - dark grey silty sand		D	0.10	
	SANDY SILT - light orange sandy silt (Natural) - more clay with depth		D	0.30	
			D	0.80	
0.90	PIT DISCONTINUED AT 0.90m DEPTH				
GROUNDWATER OBSERVATIONS: No free groundwater encountered.					

PIT No: 49

SURFACE LEVEL:

11 No. 40		SOW 102 22-23	
0.55 <			

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch404(16) Personal information

Date:

24/10/03

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 10 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

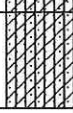
PIT No: 50

SURFACE LEVEL:

	FILLING - brown silty clay with red mottling		D	0.15		
0.40	SANDY SILT - dark brown sandy silt, becoming lighter with depth		D	0.45		
0.60			D	0.60		
0.75	SANDY CLAY - grey sandy clay with orange mottling		D	0.70		
	PIT DISCONTINUED AT 0.75m DEPTH					
GROUNDWATER OBSERVATIONS: No free groundwater encountered.						

PIT No: 51

SURFACE LEVEL:

	FILLING - grey-brown sandy gravelly clay with white rock fragments		D	0.10		
0.30	SILTY SAND - light brown silty sand with fine gravel		D	0.50		
0.60	SANDY SILTY CLAY - brown orange sandy silty clay		D	0.80		
1.00	SANDY SILTY CLAY - dark grey sandy silty clay in alluvial area of creek		D	1.30		
1.30	PIT DISCONTINUED AT 1.30m DEPTH					
GROUNDWATER OBSERVATIONS: No free groundwater encountered.						

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4 m (6) Personal information

Date: 24-1-03
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 13 January 2003

PROJECT: FURTHER INVESTIGATIONS

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 52

SURFACE LEVEL:

0.15	FILLING - brown silty sandy gravel		D	0.10	
	FILLING - red-brown silty clay with some small gravel		D	0.20	
0.40			D	0.40	
0.55	SILTY CLAY - grey mottled red-brown silty clay		D	0.50	
	<u>PIT DISCONTINUED AT 0.55m DEPTH</u>				
<p>DES Disclosure Log</p> <p>2009</p>					
GROUNDWATER OBSERVATIONS: No free groundwater encountered.					

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

PIT No: 53

SURFACE LEVEL:

0.60	SILTY CLAY - dark grey mottled brown silty clay	D	0.10	
		D	0.40	
	PIT DISCONTINUED AT 0.60m DEPTH	D	0.60	
GROUNDWATER OBSERVATIONS: No free groundwater encountered.				

GROUNDWATER OBSERVATIONS: No free groundwater encountered.

RIG: Backhoe

LOGGED: ANL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND	
A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

sch4p4(6) Personal information

Date: _____
File # _____



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 1

SURFACE LEVEL:

0.5	ASBESTOS COATED SHEETS - 30-50%					
0.75	FILL - clean					
1.0	NATURAL SOIL					
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH.					
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

PIT No: 2

SURFACE LEVEL:

0.5	FILL - clean					
1.0	ASBESTOS COATED SHEETS - 30-50%					
2.0	NATURAL SOIL					
2.5	TEST PIT DISCONTINUED AT 2.5m DEPTH.					
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch49416 Personal Information

Date: 15-10-03

File C



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TEST PIT REPORT

CLIENT: WATPAC
 PROJECT: CONTAMINATION INVESTIGATION
 LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

DATE: 6 March 2002
 PROJECT No.: 33292A

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing		Water
			Type	Depth (m)	

PIT No: 3

SURFACE LEVEL:					
0.0	ASBESTOS COATED SHEETS - 0-10%				
1.0	ASBESTOS COATED SHEETS - 30-50%				
1.5	NATURAL SOIL				
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH				
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling					

PIT No: 4

SURFACE LEVEL:					
0.0	FILL - clean				
0.5	LIMPIT ASBESTOS - 30-50% (white in appearance)				
2.0	NATURAL SOIL				
2.5	TEST PIT DISCONTINUED AT 2.5m DEPTH				
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling					

RIG: Backhoe
 REMARKS:

LOGGED: ACL

SAMPLING & IN SITU TESTING LEGEND

A Auger sample
 B Bulk sample
 D Disturbed sample
 W Moisture content (%)
 pp Pocket Penetrometer (kPa)
 PID Photo Ionisation Detector
 Ux x mm dia. tube
 Wp Plastic limit

sch4p4(6) Personal information

CHECKED

Initial

Date: 15-10-02



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 3

SURFACE LEVEL:

0.0	ASBESTOS COATED SHEETS - 0-10%	~~~~~				
1.0	ASBESTOS COATED SHEETS - 30-50%	~~~~~				
1.5	NATURAL SOIL	~~~~~				
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH	~~~~~				
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

PIT No: 4

SURFACE LEVEL:

0.0	FILL - clean	~~~~~				
0.5	LIMPIT ASBESTOS - 30-50% (white in appearance)	~~~~~				
2.0	NATURAL SOIL	~~~~~				
2.5	TEST PIT DISCONTINUED AT 2.5m DEPTH	~~~~~				
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Date: 15-10-02

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

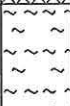
PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 5

SURFACE LEVEL:

	FILL - clean					
0.5	LIMPIT ASBESTOS - blue					
1.0	FILL - clean					
2.2	NATURAL SOIL					
2.5	TEST PIT DISCONTINUED AT 2.5m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 6

SURFACE LEVEL:

	FILL - clean					
0.5	NATURAL SOIL					
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4 (a) Personal information

Date: 15-10-02
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 7

SURFACE LEVEL:

0.5	FILL - clean					
1	NATURAL SOIL					
2	TEST PIT DISCONTINUED AT 2.0m DEPTH.					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 8

SURFACE LEVEL:

0.3	FILL - clean					
1	NATURAL SOIL					
2	TEST PIT DISCONTINUED AT 2.0m DEPTH.					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch404(16) Personal information

Date: 15-2-02
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 9

SURFACE LEVEL:

0.5	FILL - clean					
	NATURAL SOIL					
	TEST PIT DISCONTINUED AT 2.0m DEPTH					
2.0						
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

PIT No: 10

SURFACE LEVEL:

1.0	FILL - clean					
	NATURAL SOIL					
	TEST PIT DISCONTINUED AT 2.0m DEPTH					
2.0						
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling						

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	pp Pocket Penetrometer (kPa)		
B Bulk sample	PID Photo Ionisation Detector		
D Disturbed sample	Ux x mm dia. tube		
M Moisture content (%)	Wp Plastic limit		

CHECKED
☒
Date: 15-10-02
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 11

SURFACE LEVEL:

0.5	FILL - clean					
	NATURAL SOIL					
	TEST PIT DISCONTINUED AT 2.0m DEPTH.					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 12

SURFACE LEVEL:

2.0	NATURAL SOIL					
	TEST PIT DISCONTINUED AT 2.0m DEPTH.					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4 (6) Personal information

File C

Date: 15-10-02



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 13

SURFACE LEVEL:

1	2.0	NATURAL SOIL					1
2	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					2

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 14

SURFACE LEVEL:

1	2.0	NATURAL SOIL					1
2	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					2

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4 (16) Personal information

Date: 15-10-02

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 15

SURFACE LEVEL:

1	NATURAL SOIL					1
2	TEST PIT DISCONTINUED AT 2.0m DEPTH.					2

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 16

SURFACE LEVEL:

1	FILL - clean					1
	NATURAL SOIL					
2	TEST PIT DISCONTINUED AT 2.0m DEPTH.					2

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Initials:

Date: 15-10-02

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 17

SURFACE LEVEL:

PT NO. 17							
1	0.3	FILL - clean					1
		NATURAL SOIL					
2	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					2
DES Disclosure Log							
2009							
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling							

PIT No: 18

SURFACE LEVEL:

11 NO. 10		DATE: 10/12/2022				
0.2	FILL - clean NATURAL SOIL					
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch404(16) Personal Information

Date: 15-10-02
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

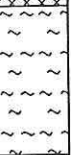
PIT No: 19

SURFACE LEVEL:

PIT NO. 10		TEST PIT LOG							
		FILL - clean							
0.5		NATURAL SOIL - clay							
2.0		TEST PIT DISCONTINUED AT 2.0m DEPTH.							
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling									

PIT No: 20

SURFACE LEVEL:

PIT No: 20		CONF RSL LEVEL:					
-1	0.3	FILL - clean					
		ASBESTOS COATED SHEETS - 50-60%					
	1.0	ASBESTOS COATED SHEETS - 80-90%					
		NATURAL SOIL					
	2.5	<u>TEST PIT DISCONTINUED AT 2.5m DEPTH</u>					
GROUNDWATER OBSERVATIONS: Groundwater observed at 1m							

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch4p4(6) Personal information

Date: 15-10-02

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 21

SURFACE LEVEL:

PT NO. 27					
0.5	FILL - clean				
1	NATURAL SOIL - clay				
2	2.0	<u>TEST PIT DISCONTINUED AT 2.0m DEPTH</u>			
DES Disclosure Log 2009					
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling					

PIT No: 22

SURFACE LEVEL:

0.5	FILL - clean					
	ASBESTOS COATED SHEETS - 20% - rotten decomposing material - wood/timber - dark black clay					
2.0	NATURAL SOIL					
2.2	TEST PIT DISCONTINUED AT 2.2m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	pp Pocket Penetrometer (kPa)		
B Bulk sample	PID Photo Ionisation Detector		
D Disturbed sample	Ux x mm dia. tube		
M Moisture content (%)	Wp Plastic limit		

CHECKED
sch404(6) Personal Information
Date: 15-10-02
File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 23

SURFACE LEVEL:

PT NO: 20							
1	0.5	FILL - clean					1
		NATURAL SOIL - clay					
2	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					2
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling							

PIT No: 24

SURFACE LEVEL:

1		FILL - clean						1
0.5		ASBESTOS COATED SHEETS - 90%						
0.75		NATURAL SOIL						
2	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH						2
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling								

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch404106 Personal information

Date: 15-10-02



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 25

SURFACE LEVEL:

0.2	FILL - clean					
	NATURAL SOIL					
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

PIT No: 26

SURFACE LEVEL:

1.0	FILL - not clean, soil - 40%, asbestos coated sheets - 40%, rubbish - 20%					
	NATURAL SOIL - clay					
2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH					

GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch40466 Personal information

Date: 15-10-02

File C



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TEST PIT REPORT

CLIENT: WATPAC

DATE: 6 March 2002

PROJECT: CONTAMINATION INVESTIGATION

PROJECT No.: 33292A

LOCATION: AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

Depth (m)	Description of Strata	Graphic Log	Sampling & Testing			Water
			Type	Depth (m)	Results	

PIT No: 27

SURFACE LEVEL:

PIT NO: 27		ECON FOR LEVEL			
1	0.5	FILL - clean			1
		NATURAL SOIL - clay			
	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH			
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling					

PIT No: 28

SURFACE LEVEL:

PIT NO: 20		CON. NO: 20			
1	0.5	FILL - clean			1
		NATURAL SOIL - clay			
	2.0	TEST PIT DISCONTINUED AT 2.0m DEPTH			
GROUNDWATER OBSERVATIONS: Groundwater not observed whilst drilling					

RIG: Backhoe

LOGGED: ACL

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A Auger sample	pp Pocket Penetrometer (kPa)
B Bulk sample	PID Photo Ionisation Detector
D Disturbed sample	Ux x mm dia. tube
M Moisture content (%)	Wp Plastic limit

CHECKED

sch404(16): Personal information

Date: 15-10-02
File C



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3.0 SITE WORK

Site work was conducted on 21 February 1996 and comprised the following:

- Excavation of 27 pits around the southern boundary of the site, and the area abutting the Bellevue Avenue properties. Inspection of the soils encountered within the pits.
- Excavation of 5 pits within the creek draining the area. Inspection of the soil and sediment encountered within the pits.
- Laboratory testing of samples collected from the pits to determine the levels of asbestos fibres within the soil and sediment.

Asbestos containing material observed during test pitting was confined to broken asbestos cement sheeting (ACS). Occasional fragments of ACS pipe were also observed. No limpet was observed. Results of test pitting are summarised in Table 1. Visual estimates were made on the percent by volume of ACS for individual soil horizons, and also the largest average dimension of material. Trace amounts of ACS were recorded as <1%. During collection of the soil samples, ACS material was not included within the samples.

TABLE 1
TEST PIT DETAILS

Pit	Depth (m)	Description	Samples
M1	0-0.4 0.4-0.8	Gravelly CLAY, brown, firm, moist, fill, 10% ACS (< 40mm), some glass & metal. CLAY with sand, brown orange, firm to stiff, moist, natural.	M1-1 0-0.1 m
M2	0-0.15 0.15-0.5	Gravelly CLAY, brown, firm, moist, fill, 5% ACS (< 40mm), some glass. CLAY, brown orange, firm to stiff, moist natural.	M2-1 0-0.1 m
M3	0-0.4	CLAY, brown grey, firm to stiff, moist becoming dry, natural.	M3-1 0-0.1
M4	0-0.5	CLAY, grey becoming brown orange, firm to stiff, moist, natural, disturbed in top most 5cm (fragment of glass).	M4-1 0-0.1 m
M5	0-0.15 0.15-0.3 0.3-0.8	CLAY, dark grey, firm, dry to moist, fill, < 1% ACS (<100mm) CLAY, brown grey, firm, dry, fill, white to cream laminar layers (asbestos?). CLAY with sandy lenses, grey orange, moist, natural.	M5-1 0-0.1 m M5-2 0.15-0.3 m

Pit	Depth (m)	Description	Samples
M6	0-0.4 0.4-0.8 0.8-1.3	Gravelly CLAY to clayey GRAVEL, firm to medium dense, moist to dry, fill, 10% ACS (< 150mm), glass, iron, tin fragments, ash and concrete rubble common. SAND, orange, loose, dry, fill. CLAY with sand, orange grey, firm, moist, natural.	M6-1 0-0.1 m M6-2 0.4-0.8 m
M7	0-0.3 0.3-0.8 0.8-1.0	Clayey GRAVEL, brown grey, loose to medium dense, moist, fill, 25% ACS (< 40mm), 5% ACS (40-100mm), metal and glass fragments common. Sandy CLAY, grey brown, firm, moist, fill, occasional pieces of plastic pipe < 1% ACS (< 3mm). CLAY, orange, grey, firm, dry, natural.	M7-1 0-0.1 M7-2 0.3-0.8 m
M8	0-0.3 0.3-0.5	Sandy CLAY, brown, firm, dry, disturbed natural?, < 1% ACS (< 40mm). CLAY, grey orange, firm, moist, natural.	M8-1 0-0.1 m
M9	0-0.3 0.3-0.8	Sandy CLAY, brown, firm, dry, fill?, or disturbed natural?, < 1% ACS < 40mm. CLAY, orange grey, firm, moist to dry, natural.	M9-1 0-0.1 m
M10	0-0.2 0.2-0.8	Sandy CLAY, dark brown, firm, dry, disturbed natural?, < 1% ACS (< 40mm). CLAY with sand, orange brown, firm, moist, natural.	M10-1 0-0.1 m
M11	0-0.2 0.2-0.7 0.7-1.0	Sandy CLAY with gravel, dark brown, firm, dry, fill? CLAY, brown, firm, moist, natural. CLAY, grey, firm, moist to wet, natural.	M11-1 0-0.1 m
M12	0-0.3 0.3-0.8	Clayey GRAVEL, brown grey, medium dense, moist, fill, 30% ACS (< 40mm) Sandy CLAY, orange brown, stiff, moist, natural.	M12-1 0-0.1 m
M13	0-0.15 0.15-0.4 0.4-0.6	Sandy silty CLAY, dark grey, firm, moist, disturbed natural, occasional fragments of glass Silty CLAY, grey, firm, moist, natural. Sandy CLAY, orange brown, firm, moist, natural.	M13-1 0-0.1 m
M14	0.0.3 0.3-0.9	Sandy CLAY, dark brown, firm, moist, disturbed natural, < 1% ACS (< 100mm). CLAY, dark grey, soft to firm, moist, natural.	M14-1 0-0.1 m
M15	0-0.5 0.5-1.4	Clayey GRAVEL, grey, loose, moist to wet, fill, 20% ACS (< 50mm), some metal wood and concrete rubble. CLAY, grey, firm, moist, natural, tree roots.	M15-1 0-0.1 m M15-2 0.1-0.5 m
M16	0-0.3 0.3-0.9	CLAY, dark brown, firm, moist, disturbed natural, 5% ACS < 100mm CLAY, grey orange, firm, moist to wet, natural.	M16-1 0-0.1 m
M17	0-0.3 0.3-1.0 1.0-1.1	Clayey SAND, brown orange, medium dense, moist, disturbed natural, 5% ACS (< 200mm) Sandy CLAY, grey, firm, moist, natural. Sandy CLAY, light grey orange, soft, wet, natural.	M17-1 0-0.1 m
M18	0-0.4 0.4-1.0 1.0-1.2	Clayey GRAVEL, grey, loose, moist to wet, fill, 30% ACS (< 100mm), metal glass fragments. Sandy CLAY with lenses of coarse sand, brown, soft, moist to wet, natural? Sandy CLAY, grey, soft, moist to wet, natural.	M18-1 0-0.1 m

Pit	Depth (m)	Description	Samples
M19	0-0.6 0.6-1.0 1.0-2.0	CLAY, brown, firm, dry, fine, < 5% ACS (< 50mm). Sandy silty CLAY, grey, firm, dry, natural. CLAY, khaki brown grey to orange brown, stiff, dry, natural.	M19-1 0-0.1 m
M20	0-0.05 0.05-0.25 0.25-0.5 0.5-1.0	CLAY, dark brown, firm, dry, fill. Gravelly SAND, brown, loose, dry, fill, some concrete rubble and metal. Sandy silty CLAY, grey, firm, dry natural. Sandy CLAY, khaki brown, stiff, dry natural	M20-1 0-0.1 m
M21	0-0.3 0.3-0.8	Sandy silty CLAY, grey, firm, dry, disturbed natural, < 1% ACS (< 50mm) Sandy CLAY, orange grey, firm to stiff, moist, natural.	M21-1 0-0.1 m
M22	0-0.4 0.4-0.8 0.8-2.0	Sandy CLAY, grey, firm, dry, fill < 1% ACS (< 80mm). Sandy silty CLAY, grey, firm, dry natural. CLAY, orange grey, shift, moist, natural, becoming gravelly with depth.	M22-1 0-0.1 m
M23	0-0.5 0.5-0.7 0.7-1.9	Gravelly CLAY, pink orange, firm, dry, fill, < 1% ACS (< 5mm) to 2% ACS (< 40mm) with depth. Sandy silty CLAY with gravel, grey, firm dry natural. Sandy CLAY, orange grey, firm to stiff, moist natural.	M23-1 0-0.1 m
M24	0-0.3 0.3-0.8	Silty CLAY, grey, firm, dry, natural Sandy CLAY, khaki brown, stiff, moist natural.	M24-1 0-0.1 m
M25	0-0.3 0.3-0.4 0.4-1.6	Sandy clayey GRAVEL, brown, medium dense, dry, fill. Gravelly CLAY, grey, firm, dry, fill, 5% ACS (< 50mm). CLAY, khaki brown, firm to stiff, moist, natural, becoming orange grey with depth.	M25-1 0.3-0.4 m
M26	0-0.1 0.1-0.3	GRAVEL, dark brown, very loose, wet (sediment). Sandy CLAY, grey orange, soft, wet, natural	M26-1 0-0.1 m M26-2 0.1-0.3 m
M27	0-0.05 0.05-0.3	Sandy CLAY, dark grey orange, soft to firm, wet, natural. Sandy CLAY, grey, firm, wet, natural.	M27-1 0-0.05 m M27-2 0.05-0.3 m
M28	0-0.2 0.2-0.4	Sandy GRAVEL, dark grey, very loose, wet fine gravel (sediment). Sandy CLAY, orange, firm, wet, natural	M28-1 0-0.2 m M28-2 0.2-0.4 m
M29	0-0.2 0.2-0.4	Sandy GRAVEL, dark grey, very loose, wet, fine gravel (sediment). Sandy CLAY, brown, soft to very soft, wet, natural.	M29-1 0-0.2 m M29-2 0.2-0.3 m
M30	0-0.1 0.1-0.2	Sandy GRAVEL, dark grey, very loose, wet, fine gravel (sediment). Sandy CLAY, grey orange, firm, wet, natural.	M30-1 0-0.1 m M30-2 0.1-0.2 m

Pit	Depth (m)	Description	Samples
M31	0-0.1	Sandy CLAY, dark brown, firm, dry, fill? 5% ACS (< 80mm).	M31-1 0-0.1 m
	0.1-0.4	CLAY, brown, firm, moist, fill	M31-2 0.6-0.9 m
	0.4-0.9	CLAY, dark grey to brown, firm, moist, fill, 5% ACS (< 60mm).	
	0.9-1.9	CLAY, brown orange, firm to stiff, moist natural	
M32	0-0.3	Silty CLAY, grey, firm, dry, natural.	M32-1 0-0.1 m
	0.3-0.6	Sandy CLAY, khaki brown, stiff, moist, natural.	

4.0 LABORATORY TESTING

Samples were tested for asbestos by Envirohealth Consulting Pty Ltd, Spring Hill, using polarised light microscopy and stereo microscopy. Results of testing are shown in Table 3. The original Certificates of Analysis are attached as Appendix A. Field observations relating to the amount of ACS contained in each sample have been included for comparison. Laboratory results comprise visually estimated percentages of asbestos minerals. Trace levels are ≥ 5 to < 100 fibres or fibre bundles. The detection limit of the procedure is > 5 fibres.

TABLE 3
LABORATORY TESTING RESULTS

Sample	Depth Interval (m)	Laboratory Results			Field Observation
		Chrysotile	Crocidolite	Amosite	
M1-1	0-0.1	5%	trace	nil	10% ACS (<40 mm)
M2-1	0-0.1	nil	nil	nil	5% ACS (<40 mm)
M3-1	0-0.1	nil	nil	nil	None observed
M4-1	0-0.1	nil	nil	nil	None observed
M5-1	0-0.1	nil	nil	nil	<1% ACS (<100 mm)
M5-2	0.15-0.3	5%	nil	nil	None observed
M6-1	0-0.1	trace	trace	nil	10% ACS (<150 mm)
M6-2	0.4-0.8	trace	trace	nil	None observed
M7-1	0-0.1	5%	nil	nil	25% ACS (<40 mm) 5% ACS (<100 mm)
M7-2	0.3-0.8	trace	trace	trace	<1% ACS (<3mm)
M8-1	0-0.1	nil	nil	nil	<1% ACS (<40 mm)
M9-1	0-0.1	nil	nil	nil	<1% ACS (<40 mm)
M10-1	0-0.1	trace	nil	nil	<1% ACS (<40 mm)

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO AB-8.5/B
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.2		Gravel-road base. FILL.	
0.2 - 0.3		Asbestos sheeting and fibres, light grey, moist. Asbestos fragments very friable. FILL.	AB - 8.5/B 0.0 - 0.3
0.3 - 0.5		Asbestos fibre, light grey/off-white, very soft and spongy, moist - FILL.	AB - 8.5/B 0.3 - 0.5
0.5 - 1.5		AC sheeting fragments, light grey, friable, moist - FILL.	AB - 8.5/B 0.5 - 1.5
1.5 - 3.2		As above, with a number of voids - FILL.	AB - 8.5/B 1.5 - 3.2
3.2 - 3.6		CLAY, dark grey, soft to very soft - Natural soil	AB - 8.5/B 3.2 - 3.6
		End of Borehole 3.6m.	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO E-11/B
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.05		Bitumen.	
0.05 - 1.1		Gravelly SAND, light brown, moist "deco" decomposed granite - FILL.	E - 11/B 0.05 - 0.3
1.1 - 1.75		Gravelly CLAY, dark red, mottled green brown, fragment of steel at 1.75m - FILL, moist.	E - 11/B 1.1 - 1.5
1.75 - 2.0		AC sheeting, light grey, firm, moist.	E - 11/B 1.75 - 2.0
2.0 - 2.7		Asbestos fibre, light beige, AC sheet fragments.	E - 11/B 2.0 - 2.5
2.7 - 3.1		Clayey SAND and fine GRAVEL, medium greenish brown, moist - decomposed granite FILL (?).	E - 11/B 2.7 - 2.9
3.1 - 2.7		Clayey GRAVEL, grey brown, wet, fragments of timber fibre and strands of woven sacking - FILL.	E - 11/B 3.1 - 3.7
3.7 - 4.1		Very soft CLAY, dark grey/black - slurry.	E - 11/B 3.7 - 4.1
4.1 - 4.3		SAND, very fine, trace of fine gravel, grey mottled brown.	E - 11/B 4.1 - 4.3
		End of Borehole 4.3m	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

Release

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO G-8/B
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.03		Bitumen mix.	
0.03 - 0.25		Concrete slab.	
0.25 - 1.25		Asbestos fibre, cream white, and fine-coarse gravel; fragments of AC (?) sheeting, cream-white, occasionally light grey.	G-8B 0.25 - 0.75
1.25 - 1.35		Asbestos fibre, cream white, spongy; asbestos sludge.	G-8B 1.25 - 1.35
1.35 - 1.5		Gravelly CLAY, very soft, with some white asbestos particles of coarse sand size.	G-8/B 1.35 - 1.5
		End of Borehole 1.5m	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

Release

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO G-10/B
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.05		Gravel - Road Base.	
0.05 - 0.7		Asbestos (?) Fibre and fragments of AC sheet, beige and light grey colour, moist.	G-10/B 0.0 - 0.3 G-10/B 0.3 - 0.7
0.7 - 1.6		Asbestos fibre, beige, spongy, soft, moist, below 1.0m small return of cuttings.	G-10/B 0.7 - 1.0 G-10/B 1.0 - 1.5
1.6 - 2.0		Clay, dark brown, firm to stiff.	G-10/B 1.6 - 1.9
		End of Borehole 2.0.	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

Release

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO BH1
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.03		Bitumen.	
0.03 - 0.6		CLAY, sandy dark brown/grey.	Strong hydrocarbon smell, rapidly disappearing.
0.6 - 0.9		Clayey GRAVEL, dark grey.	Strong hydrocarbon smell.
0.9 - 1.6		CLAY, red, stiff.	No hydrocarbon smell.
1.6 - 3.0		Gravelly CLAY, grey-green, mottled yellow (residual clay).	No hydrocarbon smell.
		End of Borehole 3.0m	PID detector fault.

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after ... hours

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO BH2
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.03		Bitumen.	
0.03 - 0.5		Clayey GRAVEL, dark grey.	Some hydrocarbon smell at 0.5m. PID = 10ppm.
0.5 - 0.8		CLAY yellow moist.	No hydrocarbon smell at 0.7m. PID = 10ppm.
0.8 - 1.5		CLAY, yellow red, residual clay.	No hydrocarbon smell at 1.5m. PID = 6.0ppm.
1.5 - 3.0		Phyllite greenish grey.	At 2.5m PID = 52ppm. At 3.0m PID = 207ppm.
		End of Borehole 3.0m	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

Release

BOREHOLE REPORT

CLIENT Australian Catholic University
PROJECT Site Screening and Development Options
LOCATION Marklea Site, Mitchelton

JOB NO 84F098A
DATE 23/01/95
BOREHOLE NO BH3
TESTED BY BS

Depth (m)	USC Symbol	Description of Strata	Sampling and Comments
0.0 - 0.2		Concrete.	
0.2 - 0.4		Gravelly CLAY, dark grey, moist.	
0.4 - 1.1		CLAY, red mottled yellow, residual clay, moist.	No hydrocarbon smell. At 0.5m PID = 11.7ppm. At 1.0m PID = 38ppm.
1.1 - 3.0		Shale, greenish grey (bedrock).	No hydrocarbon smell. At 1.5m PID = 14ppm.
		End of Borehole 3.0m	

RIG REMARKS

OPERATOR

LOGGED

SAMPLING
& IN SITU
TESTING

D - Disturbed sample
A - Auger sample
U - 50 mm tube

WATER OBSERVATIONS

☐ free water observed
☒ standing water level after
... hours

Record of Borehole

Client JAMES HARDIE INDUSTRIES LIMITED
 Project INVESTIGATION OF FACTORY SITE
 Location BELLEVUE AVENUE,
 ENOGGERA
 Job number 83M/1620
 Date 19/1/84



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Borehole number GRID LOCATION A-8/8.5		Surface RL 35.38	Sampling and field testing		
Depth of Strata change (m)	Classification Australian Standard 1726-1981	Bit used	Depth (m)	Type	Field test results
0.00	<u>BITUMEN</u> Surface	TC	0.00-0.25	D	
0.025	<u>TOP COURSE GRAVEL</u>				
0.25	<u>FILL</u> Waste A/C sheeting, broken, moderately well compacted, grey, some yellow brown silty clay of high plasticity, moist.		0.25-3.20	D	
1.30	<u>FILL</u> Waste A/C sheeting as above, loose clay content decreasing with depth.				
3.20	<u>NATURAL Silty CLAY (CH)</u> Firm, high plasticity, dark grey, trace of fine grained gravel, moist.				
3.40	<u>Silty CLAY (CH)</u> Stiff, high plasticity, grey with yellow brown mottling, trace of fine grained gravel, moist.				
4.00	BOREHOLE TERMINATED				
Drill type JACRO 350 100mm diameter Solid Flight Spiral Auger				Water noted	Not
Driller P. CHRISTENSEN				Steady level	Applicable

U 50 Undisturbed 50mm diam tube sample
 O Disturbed Sample
 SPT Standard Penetration Test, N Value is number of blows to drive 50mm sampler 300mm
 with a 63.5kg drop hammer falling 762mm. Blow count shown is the number of
 blows required to drive U50 300mm
 P Hand penetrometer estimate of shear strength kPa

S Vane shear value, kPa
 V Steel V Bit
 TC Tungsten Carbide Bit
 OC Dynamic Cone Test, 9.09kg hammer, fall 508mm, driving 30 degree taper cone
 20mm, fitted to rods of smaller section

Record of Borehole

Client JAMES HARDIE INDUSTRIES LIMITED
 Project INVESTIGATION OF FACTORY SITE
 Location BELLEVUE AVENUE,
 ENOGGERA
 Job number 83M/1620
 Date 18/1/84



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Borehole number GRID LOCATION E 11		Surface RL 35.29	Sampling and field testing		
Depth of Strata change (m)	Classification Australian Standard 1726-1981	Bit used	Depth (m)	Type	Field test results
0.00	<u>SURFACE FILL DECOMPOSED GRANITE</u> <u>Clayey SAND (SC)</u> Medium dense, medium to coarse grained, brown, moist.	TC	0.00-1.05	D	
1.05	<u>FILL Gravelly Silty CLAY (CH)</u> Stiff, high plasticity, grey brown, some fine gravel, moist.		1.05-2.50	D	
2.60	<u>FILL GRAVEL (GP)</u> Loose, fine grained, brown, some fine sand, trace of A/C waste, moist.		2.50-3.20	D	
3.20	<u>FILL</u> Waste A/C slurry, loose, light grey, wet.		3.20-3.80	D	
3.80	<u>NATURAL SAND (SP)</u> Loose, fine to medium grained, grey, some fine gravel, moist.				
4.50	BOREHOLE TERMINATED				
Drill type JACRO 350				Water noted	Not
Driller P. CHRISTENSEN				Steady level	Applicable

U 50 Undisturbed 50mm diam tube sample
 D Disturbed Sample
 SPT Standard Penetration Test, N Value is number of blows to drive 50mm sampler 300mm
 with a 63.5kg drop hammer falling 762mm. Blow count shown () is the number of
 blows required to drive U50 300mm
 P Hand penetrometer estimate of shear strength, kPa

S Vane shear value, kPa
 V Steel V Bit
 TC Tungsten Carbide Bit
 DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 30 degree taper cone
 20mm, fitted to rods of smaller section

Record of Borehole



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Client JAMES HARDIE INDUSTRIES LIMITED
Project INVESTIGATION OF FACTORY SITE
Location BELLEVUE AVENUE,
ENOGERA
Job number 83M/1620
Date 18/1/84

Borehole number GRID LOCATION G 10		Surface RL 35.48	Sampling and field testing		
Depth of Strata change (m)	Classification Australian Standard 1726—1981	Bit used	Depth (m)	Type	Field test results
0.00	<u>SURFACE GRASS</u> <u>FILL Silty SAND (SM)</u> Loose, fine grained, light grey, some pieces of A/C sheeting, moist.	TC			
0.20	<u>FILL</u> Waste A/C sheeting, broken, well compacted, light grey, moist.		0.20—0.90	D	
0.90	<u>FILL</u> Waste A/C slurry, soft, wet.		0.9—1.60	D	
1.60	<u>NATURAL Clayey Silty SAND (SM)</u> Very loose, fine to medium grained, grey, trace of fine gravel, wet.				
1.90	<u>Clayey GRAVEL (GC)</u> Loose, fine grained, brown, moist, clay fines of low plasticity.				
2.50	BOREHOLE TERMINATED				
Drill type JACRO 350			Water noted Not		
Driller P. CHRISTENSEN			Steady level Applicable		

U 50 Undisturbed 50mm diam tube sample
D Disturbed Sample
SPT Standard Penetration Test, N Value is number of blows to drive 50mm sampler 300mm
with a 63.5kg drop hammer falling 762mm (blow count shown) i is the number of
blows required to drive 1250 300mm
P Hand penetrometer estimate of shear strength, kPa
20-290

S Vane shear value, kPa
V Steel V Bit
TC Tungsten Carbide Bit
DC Dynamic Cone Test, 9.09kg hammer, fall 508mm, driving 30 degree taper cone
20mm, fitted to rods of smaller section

Record of Borehole



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Client JAMES HARDIE INDUSTRIES LIMITED
Project INVESTIGATION OF FACTORY SITE
Location BELLEVUE AVENUE,
ENOGGERA
Job number 83M/1620
Date 19/1/84

Borehole number GRID LOCATION G 8		Surface RL 35.59	Sampling and field testing		
Depth of Strata change (m)	Classification Australian Standard 1726-1981	Bit used	Depth (m)	Type	Field test results
0.00	CONCRETE PAVEMENT	TC			
0.20	FILL Waste A/C sheeting slurry, soft, light grey, wet.		0.20-1.20	D	
1.20	NATURAL Silty SAND (SM) Very loose, fine grained, dark grey, some fine gravel and clay fines of low plasticity, wet.				
1.50	BOREHOLE TERMINATED				
Drill type JACRO 350				Water noted	Not
Driller P. CHRISTENSEN				Steady level	Applicable

U 50 Undisturbed 50mm diam tube sample
D Disturbed Sample
SPT Standard Penetration Test, N Value is number of blows to drive 50mm sampler 300mm with a 63.5kg drop hammer falling 762mm. Blow count shown is the number of blows required to drive U50 300mm
P Hand penetrometer estimate of shear strength, kPa

S Vane shear value, kPa
V Steel V Bit
TC Tungsten Carbide Bit
DC Dynamic Cone Test, 9.09kg hammer, fall 508mm, driving 30 degree taper cone 20mm, fitted to rods of smaller section

APPENDIX E

**Remediation Action Plan
Revision 1**

Published on DES Disclosure Log
RTI Act 2009

Release

**REMEDIAL ACTION PLAN
AUSTRALIAN CATHOLIC UNIVERSITY
53 PROSPECT ROAD, MITCHELTON, BRISBANE**

DATE OF EFFECT:

Date of Approval of Development Application, EPA application number BCC/7/77(?)

RPD: Lot 2 on RP 155212

EPA File: BNE9175

1.0 INTRODUCTION

This Remedial Action Plan (RAP) was prepared for the site at the Australian Catholic University, 53 Prospect Road, Mitchelton, Brisbane. The RAP is to be submitted as part of an application for multi-use educational, residential and parkland redevelopment of the site.

The property currently consists of a university campus that has operated for approximately 17 years. The catholic university will be relocating to Banyo, and the Mitchelton site is planned for redevelopment. Part of the redevelopment includes continuation of university use by another religious denomination on a smaller section of the site (proposed new Lot 50 as shown in Drawing No 1 in the DP Stage 1 report).

1.1 Purpose of the RAP

The purpose of the RAP is to provide a detailed plan of activities, procedures and objectives to ensure the effective and controlled remediation and validation of the site. It describes the procedures and standards to be followed throughout the project to facilitate successful remediation to ensure protection of human health and the environment.

1.2 Objectives

The primary objectives of the remediation program at the site are:

- To make the site safe for the proposed uses.
- To prevent the potential long-term generation and release of asbestos.
- To ensure the protection of the community and local environment.

This RAP:

- Summarises the current status of the site; and
- Provides remedial and validation strategies to address contamination from the site in a manner that protects human health and the environment and ensures the site is suitable for the proposed redevelopment.

Contamination at the site must be addressed in accordance with this RAP.

2.0 BACKGROUND

2.1 Description of Proposed Development

A development application has been made for educational, residential and parkland redevelopment of the former ACU site. The full development includes three existing allotments as follows:

- Lots 1 and 2 on Registered Plan 155212; and
- Lot 78 on Registered Plan 18783.

Lot 1 covers the whole of the adjoining Mt Maria College, however, only a small part of this allotment including the former Brookview laundry is included in the proposed development. This area will be subdivided from Lot 1 when boundaries are realigned.

Lot 78 is a small parcel fronting Bellevue Avenue and has always been used as a driveway entrance.

Lot 2 is the main site of ACU, and is the only allotment affected by contamination by asbestos. This RAP applies only to Lot 2.

The existing Lots 1 and 2 are proposed to be subdivided into new allotments, and these were shown in the DP Stage 1 report as Drawing No 1:

Proposed Lots 1-49	Residential use, low and medium intensity
Proposed Lot 50	University use
Proposed Lots 901 and 902	Parkland

2.2 Previous Investigations

The following contamination investigations have been conducted at the site:

- RUST PPK Pty Ltd (February 1995) *Asbestos Screening and Health Risk Assessment: Australian Catholic University, Mitchelton Campus.*
- RUST PPK Pty Ltd (June 1995) *Asbestos Screening, Mitchelton Campus.*
- Dames & Moore (March 1996) *Further Site Investigation, McAuley Campus, ACU.*
- Dames & Moore (August 1996) *Management Plan Asbestos Affected Land: McAuley Campus, ACU.*

In addition to the above reports produced for the university site, the following reports were produced for the site adjoining the university on its southern side, which was formerly a Wunderlich factory producing asbestos-based building products:

- RUST PPK Pty Ltd (September 1994) *Preliminary Site Assessment: Australian Catholic University, Mitchelton.*
- RUST PPK Pty Ltd (March 1995) *Site Screening and Development Options: Australian Catholic University, Mitchelton.*

2.3 Local Topography

The southern boundary area of the ACU site containing asbestos contamination has a gentle slope of approximately four metres from west to east.

Stormwater runoff in the southern area flows into an open stormwater drain that flows generally eastwards. The drain is fed by 2 x 1.8 metre diameter stormwater pipes that drain the neighbouring industrial site.

2.4 Geology

The Caboolture 1: 100,000 Geological Sheet indicates the site to be underlain by Palaeozoic phyllite, minor labile arenite and rare basic metavolcanics from the carboniferous era. Based on local knowledge, this rock type is classified as Bunya Phyllite.

2.5 Hydrogeology

Only limited perched groundwater has been found in several investigations conducted in the contaminated part of the site. Groundwater was observed in TP 20 of the Douglas Partners Stage 1 investigation at approximately one metre below ground level adjacent to the outlet of the two stormwater pipes. This indicated that water was moving along the outside of the pipes, probably in bedding sand around the pipes. It did not indicate a groundwater table. These pipes are located through the contaminated area.

No groundwater was found in any other test pit, including three pits excavated to approximately four metres deep in the location of the proposed containment cell. The university area is not within a licensed borefield, and as the site is adjacent to an industrial area, no groundwater users are expected.

3.0 EXTENT OF CONTAMINATION

3.1 Asbestos Contamination

The only contamination at the ACU site is buried asbestos in the southeastern part of the site (Drawing No. 1). Most of the asbestos is in the form of broken fibro sheeting, with some fibrous limpet material.

3.2 Current Impact

The asbestos is generally covered with 500-900 mm of fill, which mitigates the impact of contamination on health and the environment. However, in some areas, the fill itself contains small amounts of broken A/C sheeting.

4.0 ENVIRONMENTAL GUIDELINES

Remedial activities conducted at the site comply with relevant procedures described in the following documents:

- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National health and Medical Research Council, January 1992;
- Australian Standard, *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds*, 1997 (AS 4482.1-1997);
- Australian Standard, *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances*, 1999 (AS 4482.2-1999).
- Brisbane City Council (March 2000) *Guideline on Identifying and Applying Water Quality Objectives in Brisbane City*.
- National Environmental Protection Council (December 1999) *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure* (NEPM);
- Queensland Department of Environment (May 1998) *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*;
- Queensland Environmental Protection Agency (March, 2001) *Queensland Water Quality Guidelines, Draft for Comment*.

5.0 REMEDIAL STRATEGIES

5.1 Remediation Goals

No remediation acceptance criteria apply to asbestos in soil, and the affected areas must be cleaned so that no loose fibres of asbestos remain in the soil. It is proposed that all asbestos will be cleared from the areas where it currently exists, and will be relocated and placed into a containment cell to be excavated within the proposed parkland area (Drawing No. 1).

A critical goal is to remove all asbestos from proposed Lot 50 (uni site) so that this allotment can be removed from the Environmental Management Register.

5.2 Suitably qualified persons to undertake/supervise works

A person qualified in accordance with S.381 and S.395 of the *Environmental Protection Act 1994* must conduct all investigations, supervise all remediation works and compile report/s required to remediate the site.

5.3 Extent of Contamination

The extent of contamination has been identified to within lateral distances of 5-15 metres, and is shown in Drawing No 1. Locations with higher content asbestos along the southern boundary have been identified to within 7.5 metres.

5.4 Strategies Applied

The following strategies are proposed:

- Excavation of asbestos from its current location and reburial in a containment cell (Drawing No. 1) in the proposed parkland area (new Lot 902). Depth of the cell is expected to be 5.5 metres;
- Installation of secure capping over the containment cell of 0.5 metres in depth, not including topsoil; and
- Validation of the excavations from where asbestos was removed.

6.0 REMEDIATION PROGRAM

6.1 Overview

Remediation of contamination must be performed by excavation of the asbestos in areas shown in Drawing No 1 and reburial of this material in the newly created containment cell on proposed Lot 902 as shown in Drawing No 1. Steps of the remediation process are described as follows. All volumes quoted are *in-situ*:

1. Excavate fill material containing asbestos in Area A to 0.5-0.9 metres in depth (176 m³) and Area B to 0.9 metres in depth (817 m³) as shown in Drawing No 1, and stockpile this material in Area C.
2. Validate that all asbestos material has been removed from Areas A and B by soil sampling and testing. (See S.8.1 for validation sampling and testing.)
3. Begin excavations of the containment cell in Area D, and backfill Area A to the required depth with the first of the excavated material (approximately 176 m³). Continue the cell excavation to 5.5 metres in depth below current ground levels, with a batter slope of 1:1 on the walls. Stockpile remaining excavated material from the cell in the current carpark. The volume of the cell should be approximately 6,000 m³, with a depth of 5.5 metres.

4. Excavate Area F to 1-2 metres in depth (approximately 1,550 m³) and place in the cell.
5. Excavate Area G to 0.4 metres in depth (approximately 600 m³) and place in the cell.
6. Excavate Area C (including the stockpile of soil from Areas A and B) (approximately 350 + 993 m³) and place in the cell.
7. Excavate Area H to 0.3 metres in depth (approximately 100 m³) and place in the cell.
8. Validate all excavated areas to be free of asbestos, in accordance with the criteria in S.8.
9. Backfill and cap the cell with clean soil to a depth of at least 0.5 metres in depth from the stockpile in Area E, and compact in accordance with the specifications in Table 1. Cover the top of the backfill with 200 mm marker mesh.
10. Backfill all excavated areas from the stockpile in Area E, and compact in accordance with the project landscape plan.
11. Spread topsoil over all backfilled areas, and stabilise with appropriate vegetation plantings and surface mulch. Vegetation planted on the cell must not be large trees with deep roots. Small to medium trees that will grow to a maximum of 3-4 metres in height are acceptable.

The majority of excavations to remove contamination will be shallow and therefore relatively easy. However, immediately adjacent to the southern boundary where the contamination is deepest, it will be necessary to hold back asbestos fill from the adjoining industrial site. Construction of an underground shotcrete retaining wall as shown in Drawing No 5 is recommended.

6.2 Backfilling and Compaction

Contaminated soil placed in the containment cell must be compacted to reduce its volume so that the required volume will fit into the cell. Compaction and testing criteria that must be achieved is listed in Table 1.

Table 1: Field Compaction and Testing Criteria

Field Compaction	Testing Frequency	Project Specifications
Determination of Field Moisture Content (AS1289.2.11-1992), Field Dry Density by Nuclear Density Gauge (AS1289.5.8.1-1995) and Dry Density/Moisture Content relationship using standard compactive effort (AS1289.5.1.1-1993).	1 test per 500 m ³ /lift of 300 mm	90-95% of Standard Maximum Dry Density, 1% dry to 3% wet of Standard Optimum Moisture Content
Material Placement	NA	300 mm lift prior to compaction

Only clean fill must be used to backfill excavated areas. Such fill shall be placed only after excavations have been validated to be clean of asbestos.

6.3 Overview of the Remedial Program

The suitably qualified professional qualified in accordance with S.5.2, must carry out the following duties:

- Monitor and enforce compliance with the Health and Safety Plan;
- Monitor and enforce contractor compliance with the RAP,
- Inspection and maintenance of the integrity of the environmental protection measures around the site;
- Report to the owner and Administering Authorities (Brisbane City Council, Division of Workplace Health and Safety and EPA) any breaches or possible breaches of health and safety or environmental compliance within 12 hours following detection. This includes any strong or unusual odours or unusual substances encountered in any excavation;
- Overseeing excavation, with particular reference to the excavation of ash and or tar materials not previously identified.
- Maintain a site diary in which the following will be recorded:
 - date
 - general weather conditions
 - details of any unusual materials revealed during the excavations and details of actions taken to determine their risk
 - details of any incidents, near misses or incidents, which may have resulted in injury, and the actions taken to prevent their recurrence
 - details of any environmental issues, which may result in environmental concern and measures taken to correct them
 - details of any visitors to the site or other matters relating to environmental or health issues.

6.4 Unexpected Contamination

If during any site earthworks or excavation evidence of gross contamination not previously detected is observed, site works are to cease in that area and action taken to appropriately delineate the contamination. This material must be validated and remediated in accordance with provisions of this RAP, under supervision of a person suitably qualified in accordance with S.5.2.

7.0 OPERATIONAL CONTROL

The remediation program must be conducted with all due regard to human health and the environment. Further documentation to be produced to guide remediation activities includes the following:

- detailed Health and Safety Plan (noted also in S.10); and
- detailed specification for operational works.

In addition to all statutory compliance's required, the contractor will be responsible for conducting remediation works with all due care to ensure compliance with the following conditions:

- All works involving excavation and movement of asbestos material must be carried out by an appropriately licensed asbestos contractor;
- Air monitoring for asbestos fibres must be conducted on all sides of the remediation site and at all times around excavation and removal works involving asbestos;
- If the soil is dry, copious quantities of water must be applied at the point of asbestos excavation, transportation and dumping to avoid generation of airborne fibres (see S.7.5);
- Airborne dust must be minimised on site by regular watering of all tracks and plant operational areas;
- Water containing any suspended matter or contaminants must be managed within the site in such a manner to minimise pollution of adjacent sites and waterways;
- Vehicles must be controlled such that minimal mud, soil or water will fall or be deposited on any public or private roadway or adjacent areas;
- Noise levels at the site boundary will comply with the required legislative requirements.

The owner must ensure that the contractor's site manager/foreman is conversant with the contents of the RAP and Health and Safety (H&S) Plan. Additionally they will ensure each employee or sub-contractor involved with remediation is inducted into the requirements of the RAP and H&S Plan.

7.1 Control of Stormwater

Remediation works must comply with requirements for stormwater management as outlined in Schedule B(9) of the NEPM. This includes management of excavated soil in a manner that shall prevent contamination from being transported off-site by stormwater.

The contractor must control surface waters on the site as follows:

- Divert clean stormwater runoff outside the site so that it does not flow through the site;
- Control drainage on the site by interception and redirecting clean runoff in a controlled manner;
- Stormwater collected from the site in trenches and sumps will be appropriately managed;
- Silt fences will be erected at locations where stormwater may flow from the site.

Local Government approval must be sought prior to discharge of water from the site. Water collected in excavations in contact with contaminated soil must be sampled and analysed for asbestos to determine a suitable disposal option. Procedures such as pumping discharge water through adequate filtration will be required to reduce sediment load before discharge.

7.2 Control of Soil and Sediment

Sediment released to surface waters must be minimised by the use of sediment controls such as diversion drains, hay bales and silt fencing. Any silt or soil containing asbestos must not be released to stormwater outlets.

Any plant or equipment that handles contaminated soils must be inspected prior to leaving the site, and cleaned as necessary.

The requirements for the management of sediment and soil described in Schedule B(9) of the NEPM (from which the above control measures are drawn) must be complied with during remedial works.

7.3 Control of Groundwater

No groundwater will be discharged to lands adjoining the site, waterways or into stormwater drains unless first subjecting these waters to analytical tests and the water does not contain asbestos fibres.

7.4 Control of Noise

Noise levels must comply with BCC and EPA requirements. It is expected that equipment to be used in the remedial program will not generate unacceptable levels of noise above these requirements. The contractor will keep noise levels to a minimum and levels will not exceed limits indicated in AS 2436-1981.

7.5 Control of Dust

Generation of dust must be kept to a minimum by the addition of copious volumes of water during all phases of disturbance of soil containing asbestos. More detailed descriptions of dust control will be described in the Health and Safety Plan, however, if no rain has fallen and the soil is dry, water must be added at the following stages to effectively minimise generation of airborne dust:

- before excavation;
- during excavation;
- when soil is loaded into trucks;
- before soil is dumped from trucks;
- during dumping of soil from trucks;
- before and during compaction of soil in the containment cell; and
- along tracks around the remediation area.

Volumes of water needed for dust suppression will require a supply from a 100 mm pipeline, as well as a water truck.

Water used for dust suppression must not be allowed to escape off-site by the stormwater system, sewer, or any other means. Compliance with Schedule B(9) of the NEPM, must be achieved, which is in addition to BCC and EPA requirements.

7.6 Odour Control

The level of odour generated during remedial activities must be monitored, with compliance with BCC and EPA requirements.

In the event that odorous compounds are encountered, the contractor under the supervision of the person qualified in accordance with S.5.2 shall take all precautions to ensure minimal obnoxious odours migrate from the site boundaries. To minimise odours if encountered, only small volumes of the material must be

excavated at any one time. Any fill containing significant quantities of odorous compounds must be placed in a bunded area and covered with plastic sheeting and sprayed with an odour suppressant as soon as possible.

7.7 Public Complaints System

A public complaints system must be established prior to the commencement of remedial works to address any issues that may arise in the community as a result of works on the site. Records must be kept of the name, date, time, reason, investigation person, responsible site person, and outcome of the complaints.

8.0 VALIDATION PROGRAM

Objectives of the validation program are to ensure that:

- All asbestos materials and soil contaminated with asbestos is excavated and reburied in the containment cell;
- No heavy metal or organic contaminants exist on-site;
- Contaminant concentrations in the walls and bases of the excavations comply with the Remedial Goals (S.5.1); and
- Any backfill material to be placed in the excavations is not contaminated.

A quality assurance/quality control (QA/QC) program must be implemented to verify the accuracy and reproducibility of the analyses performed for the validation program. The QA/QC program must be conducted in accordance with the Australian Standard AS4482.1-1997 and the NEPM guidelines. All validation works must be supervised by a suitably qualified professional in accordance with S.5.2.

8.1 Validation Soil Sampling

Validation soil sampling after excavation works have been completed must be conducted in accordance with the protocols for the assessment of site contamination that are provided in the EPA May 1998 guidelines, the Australian Standard AS 4482.1-1997 and NEPM guidelines. The sampling program must be a systematic sampling pattern. Validation samples must be collected at an appropriate sample density equivalent to one sample per 50 m³ of contaminated soil removed. Where soil is taken from shallow excavations, discrete validation samples must be taken at a minimum intensity of one sample per 25-40 m². Analyses for asbestos must be performed at a NATA approved laboratory using dispersion staining. At least one validation sample per 20 tests must be duplicated and tested for asbestos using electron microscopy to confirm results of dispersion staining tests.

Discrete validation samples must be taken by a suitably qualified person as defined in S.381 of the EP Act and dispatched to the laboratory in accordance with the soil sampling and handling procedures outlined in the Australian Standard AS 4482.1-1997 and NEPM guidelines. Lithological logging of the excavation must also be performed according to the procedures outlined in AS 4482.1-1997 and the NEPM.

Where contaminant concentrations in validation samples exceed the remedial goals, further excavation and validation sampling must be conducted until the site is remediated to a level suitable for residential use that does not pose a threat to human health or the environment.

8.2 Sample Dispatch and Documentation

Samples must be collected in the appropriate containers and labelled to identify their origins as described by AS4482.1-1997. These shall be dispatched to the laboratory for analysis within 24 hours of collection. Chain of Custody documentation and handling must be performed in accordance with the Australian Standard AS4482.1-1997 and the NEPM guidelines. Sample Receipt Advice documentation must be requested from the laboratory and submitted in the validation report referenced above along with Chain of Custody documents.

8.3 Quality Assurance/Quality Control (QA/QC) program

A field QA/QC program must be conducted in accordance with the NEPM, Australian Standard AS4482.1-1997 and EPA recommendations, to measure the precision of the field/laboratory analyses and to determine the accuracy of the primary laboratory's analyses.

9.0 DECONTAMINATION PROCEDURES

Decontamination procedures for sampling equipment, personnel and the general site must be in accordance with the Australian Standard AS 4482.1-1997 and the NEPM guidelines (Schedule B(9)).

10.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed at the site where employees may be exposed to hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site must read and understand the Health and Safety Plan. All staff working on the site during remediation works must be inducted and sign relevant forms stating that induction has been carried out.

11.0 REPORTING REQUIREMENTS

A report must be prepared and submitted to the EPA CLU within 45 days of the completion of remediation and validation works. The report must be prepared by a person qualified in accordance with S.5.2.

The report must be prepared and submitted in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998, the NEPM and the Environmental Protection Act 1994. The report must document remediation and validation program activities including the results of any further excavation and/or validation required by the results of the initial validation testing, an evaluation

of the results against the remedial goals and an investigation demonstrating compliance with the conditions of this RAP.

The report must also include the results of the QA/QC program, and copies of documentation validating the appropriate handling, disposal and treatment of contaminated soil and water in accordance with EPA requirements. The validation report must be submitted to the EPA for review in accordance with the *Environmental Protection Act 1994* and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (1998).

If requested by the EPA, progress reporting must be finalised and submitted to the EPA within one business day.

12.0 STATEMENT OF SUITABILITY

Prior to commencement of the land use proposed by the material change of use, a Statement of Suitability must be obtained from the EPA. The Statement of Suitability must specify that the site is suitable for the intended use(s).

