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REPORT ON STAGE 1 PRELIMINARY SITE CONTAMINATION INVESTIGATION

AUSTRALIAN CATHOLIC UNIVERSITY, MITCHELTON

prepared for
WATPAC

Project 33292A
October 2002

Published on DES Disclosure Log
RTI Act 2009

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Appendix A

RUST PPK (February 1994) Report

1995

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Australian Catholic University

Mitchelton Campus
Asbestos Screening and Health Risk Assessment

27 FEB 1995

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84F099A-PR3:0001 Rev A

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1 Introduction

The Australian Catholic University (ACU) has requested RUST PPK to undertake an assessment of a section of their Mitchelton campus adjoining the former James Hardie asbestos factory, now a small industrial complex. This request was made in response to the discovery that quantities of waste asbestos containing material and of potentially asbestos contaminated fill is likely to have been pushed out or to have migrated across the site boundary during the life of the factory. The University has initiated the study in fulfilling the duty of care owed to staff and students.

This study aims to identify the presence of asbestos contamination on the ACU site, to determine its likely level and extent, evaluate any health risks likely to result, and to recommend remediation or management strategies required to reduce risks to generally acceptable levels.

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2 Review of Site History

The preliminary site investigation prepared by RUST PPK for the ACU (report 84F053A-PR3:0001 dated September 1994) found evidence of fill material, likely to be contaminated with asbestos, having migrated across the boundary between what is now the ACU site and the then James Hardie asbestos factory at Mitchelton during the factory's development and operation up until approximately 1984. This evidence includes surveys and reports prepared for James Hardie, and aerial photography of the sites between 1951 and 1991.

A survey of the factory site undertaken by J. V. Lawson & Associates (referred to in our previous report) shows site levels from a railway survey of 1945, together with filled levels at an uncertain date, probably circa 1984. This survey has been used by Soil Surveys & Exploration Pty Ltd in their report 83M1620 of 28 June 1984 to investigate and make recommendations for construction of a retaining wall to prevent fill from the factory site from migrating across the property boundary. The survey and report show that substantial quantities of material had already crossed the boundary, with increases in level on the boundary of between 0.16m and 1.6m (excluding the region around the creek which flows across the ACU site). It is believed that most of this fill has been removed or pushed back behind the retaining walls. If it is assumed that the original surface slopes were small across the property boundary, then the increase in surface levels on the ACU site between 1945 and 1984 can be estimated, using the original 1945 survey levels and the 1984 survey of the toe of the fill. This gives estimates of fill depth between 0.13m and 1.2m, (again excluding the region around the creek).

The levels in the region of the creek have been treated separately because the original course and depth of the creek are uncertain, and it appears to have been realigned several times during the life of the factory, finally being piped and buried on the factory site. Fill might therefore have been substantially deeper along the original course and any temporary realignments of the creek on the ACU site, possibly up to 2-3m.

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From the survey data and aerial photography, it is clear that between 1945 and 1984, fill has been placed or has migrated along most of the length of the common boundary with the factory site, including the areas occupied by the ACU carpark and east of the creek/drain. The changes in level in the carpark are considered less likely to be the result of the migration of contaminated fill since the slope there is towards the factory site and not away from it as it is further east along the boundary. The area east of the creek/drain was almost certainly covered with contaminated fill for some of the period investigated.

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3 Methodology

Site investigations have used two approaches in determining the likely health risks arising from asbestos contamination. Since inhalation of airborne asbestos fibres is the only exposure route known to have an associated health risk, testing is aimed at determining the levels of airborne asbestos fibre likely to occur on the site as a result of soil contamination.

3.1 Soil Sampling

Research has demonstrated correlations between the concentration of asbestos in soil and the levels of fibres in air for a range of soil types and moisture levels, asbestos types, and total dust levels. The correlations are not likely to be able to accurately predict airborne fibre levels, but do provide an estimate of potential fibre levels and the resulting health risks.

A soil sampling program has therefore been used to determine the levels of asbestos in surface soil which might become airborne, either with or without additional disturbance of the area. The area to be sampled was determined by using visual evidence of asbestos containing material to identify the likely spread of material from the adjoining site. Samples were taken by hand in the 0-0.1 m and 0.1-0.3 m depth intervals, representing depths most likely to contribute to airborne asbestos from either largely undisturbed soil or as a result of shallow excavations or cultivation. Samples were submitted for analysis for asbestos fibre type and approximate concentration.

It was not the purpose of the sampling program to determine the depth of contaminated fill present on the site.

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3.2 Air Sampling

The presence of asbestos in soil will not necessarily give rise to airborne asbestos, or to unacceptable health risks. Similarly, a failure to detect asbestos in soil using any practical sampling pattern and the available test methods does not mean that it is not present on the site. Off-site sources, untested areas, or asbestos concentrations below the practical detection limit in soil could all contribute to airborne asbestos. An air monitoring program has been used to check for airborne asbestos fibres on the site. Because conditions during the test were not likely to generate significant dust levels, some limited vehicle movements and manual soil disturbance was used to simulate adverse conditions. (Commonly termed "aggressive air sampling").

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4 Results of Investigations

4.1 Site Inspection

An area at the southern end of the site was examined carefully to find evidence of asbestos containing material (ACM) in the soil. This area is bounded: on the south by a fence, with embankments and retaining walls on the former asbestos factory site, constructed in the 1980s to prevent the further migration of fill from that site; on the east by a creek/open drain and associated pipes which carry water underneath the factory site; and on the west by an unsealed carpark owned by ACU. The area is shown in Appendix B. An area approximately 4-5m wide along the southern fence is well grassed, making detailed inspection difficult. Fragments of broken asbestos cement (AC) sheeting were observed throughout this area, some very friable. A further area 7-8m wide was covered with a layer of freshly deposited fill approximately 0.3-0.6m deep. Further fragments of AC sheeting were visible on the surface of the fill at the western end. No ACM was visible in the area north of the new fill, which is also well grassed and sloped to form a shallow drainage channel towards the creek.

The area east of the creek or drain is not readily accessible for inspection, and is heavily overgrown, making investigation and testing impractical.

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4.2 Soil Sampling

Ten sample locations were selected based on the results of the site inspection described above. The locations are shown in Appendix C. Samples were submitted to Envirohealth Consulting Pty Ltd for analysis using polarised light microscopy and stereo microscopy. The results are included in Appendix D and summarised in Table 1 and in Appendix C. The statements regarding analytical methods and accuracy included with the results should be noted. Estimated asbestos concentrations are reported in ranges for total concentrations below 5%: trace (5-100 bundles of fibres per sample, or nominally <1%); and <5%. For concentrations estimated to exceed 5%, the levels of individual fibre types are reported.

4.3 Air Sampling

Air Monitoring Services was retained to undertake ambient air sampling on the site on 3 February 1995. The weather was dry and winds were light (minimum 18°C, maximum 30.8°C, wind NW at 13km/h at 09:00 at Brisbane Airport). No rain had been recorded at the Enoggera station since 30 January. Three sampling stations were set up in the locations shown in Fig 3. These locations were selected on the basis of local wind direction at the time. Sampling proceeded for four hours, during which time vehicular movements over the area of new fill, and hand disturbance of soil in the area near the fence was used to simulate typical activities which would be expected to generate dust in the area ("aggressive sampling").

The results of air sampling are included in Appendix E. All samples are reported at below the detection limit of 0.01 fibres/mL.

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The results show at least trace levels of asbestos fibre detected in all but two of the twenty samples, and at all ten of the locations tested. Greater than trace levels (<5%) were reported in seven of the twenty samples, and at six of the ten locations. One sample showed an estimated total of 10% asbestos. No surface (0.0-0.1 m) sample exceeded 5%.

Table 1

Analysis of Asbestos in Soil

Sample Location	Sample Number	Sample Depth (m)	Estimated Asbestos Levels			
			Chrysotile	Amosite	Crocidolite	Total
ACU1	1	0.0 - 0.1	trace	trace		trace
	2	0.1 - 0.2	*	*		< 5 %
ACU2	3	0.0 - 0.1	*	*		< 5 %
	4	0.1 - 0.3	trace	trace		trace
ACU3	5	0.0 - 0.1	trace	trace		trace
	6	0.1 - 0.3	5 %	5 %		10 %
ACU4	7	0.0 - 0.1	*	*		< 5 %
	8	0.1 - 0.3	*	*		< 5 %
ACU5	9	0.0 - 0.1				0 detected
	10	0.1 - 0.3	*	*	trace	< 5 %
ACU6	11	0.0 - 0.1	trace	trace		trace
	12	0.1 - 0.3	trace			trace
ACU7	13	0.0 - 0.1		trace		trace
	14	0.1 - 0.3				0 detected
ACU8	15	0.0 - 0.1	trace	trace		trace
	16	0.1 - 0.3		trace		trace
ACU9	17	0.0 - 0.1	trace			trace
	18	0.1 - 0.3	trace	trace	trace	trace
ACU10	19	0.0 - 0.1	*	*		< 5 %
	20	0.1 - 0.3	trace			trace

Note: Trace levels are >= 5 to < 100 fibres or fibre bundles (nominally < 1%).

* Fibres were detected and represented as a portion of the Total Estimated Asbestos Level.

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5 Discussion

Visual inspection has revealed widespread distribution of waste ACM fragments on the surface in the southern area of the ACU Mitchelton campus adjacent to the former James Hardie factory. Much of this material is unstable, and liable to release asbestos fibres. Analysis has shown the widespread presence of asbestos fibre in surface soils in this area at levels estimated at up to 10% in one case, and greater than 1% in several other cases. This fibre is likely to be either the breakdown product from waste ACM or loose asbestos fibre, which has migrated across the boundary from the former James Hardie factory site. The concentration in the 0.0-0.1 m interval was not found to exceed 5% in any location.

The soil analysis results show in some cases a higher asbestos concentration in the 0-0.1m interval, in some cases a higher concentration in the 0.1-0.3m interval. This might reflect the history of the location, particularly whether "clean" fill might have been placed following migration of asbestos, or might result from the accuracy of the analytical method used.

It should be noted that even the newly placed fill on the site shows traces of asbestos in five out of six samples. This is likely to reflect the fact that asbestos is widely distributed in the environment, rather than any contamination of the source of the fill. Some cross contamination from existing soil during or since placement might also have occurred.

It has been reported[1] that, under adverse laboratory conditions, soil with asbestos concentrations of 1% can generate levels of asbestos fibres in air greatly in excess of occupational exposure limits (0.1 fibres/mL for unknown asbestos mixtures), and that soils with concentrations of as little as 0.001% can give rise to >0.01 fibres/mL. Ambient air in urban areas is generally in the range 0.001-0.01 fibres/mL[1].

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1 P Imray, G Neville; Approaches to the Assessment and Management of Asbestos-Contaminated Soil. Proceedings of the Second National Workshop on the Health Risk Assessment and Management of Contaminated Sites. Ed A Langley, M van Alphen. South Australian Health Commission, 1993.

Although the research described above suggests that the concentration of asbestos in surface soil on the ACU site is sufficient to generate a high level of airborne asbestos, such levels have not been found in practice. This demonstrates the effects of other factors including soil type and moisture level, ground cover, mechanical disturbance of the soil, wind speeds and total dust loading. It is considered unlikely that airborne asbestos levels would exceed ambient levels significantly in the absence of high levels of dust.

Based on the soil analysis and air monitoring results, it is not possible to decide with confidence whether or not any person on the ACU site might have been or might in future be exposed to levels of airborne asbestos fibre significantly in excess of typical ambient concentrations as a result of asbestos levels in soil. The undeveloped nature of the area examined makes it unlikely that any one individual would be present in the area for extended periods. Time weighted average exposures would therefore be expected to be only marginally affected even if levels were significantly higher than ambient on some occasions.

There is no evidence from the limited air monitoring undertaken that, in the absence of adverse conditions such as significant disturbance of the soil and generation of dust, the levels of airborne asbestos fibres in the area would be significantly in excess of typical ambient urban levels. However, based on the estimated concentrations of asbestos in soil, there is considered to be a small risk of occasional exposure to increased levels of airborne asbestos, sufficient to require a suitable management plan to be prepared for the site.

A review of the survey information and other history for the factory site indicates that, although work was undertaken to remove the contaminated fill which migrated across the site boundary prior to 1984, and to prevent further migration with banks and retaining walls, significant quantities of asbestos contaminated soil and ACM probably remained on the ACU site with estimated depths of up to 1.2m. Realignment of the creek running through the factory site and ACU property might have resulted in even deeper fill in some areas which cannot be accurately located from the available information.

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Based on the findings of this report, the site is likely to be classified as a "Probable" site under the Contaminated Land Act. Classification as a "Confirmed" site would occur if a health or environmental hazard could be shown to exist. Reclassification of the site from "Probable" to "Released" would occur if no hazard was found, and from "Confirmed" to "Former" if, after remediation, the hazard was shown to no longer exist. Occupiers and owners of land which might be contaminated are required to notify the Contaminated Land Unit of the Department of Environment and Heritage under Section 17 of the Contaminated Land Act, 1991.

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6 Remediation and Management Strategies

The objective of any remediation or management strategy is to prevent the generation of airborne asbestos fibre, either by removal from the site or consolidation of asbestos likely to become airborne through mechanical disturbance or natural action, or by putting in place a management plan which will effectively prevent asbestos from being exposed to the air and the potential for becoming airborne. The factors affecting the selection of either alternative include:

- volume of material which would need to be removed or solidified
- cost of disposal
- effectiveness of any remediation strategy in removing all asbestos contaminated soil and of achieving a "Former" Contaminated Site classification
- ability to accurately define the extent of contamination
- intended use of the site, need for rezoning or intention to sell
- availability, practicality and cost of management options

It is understood that at present the only development option being considered for this part of the ACU site is the construction of an access road. In addition, the piping and burying of the creek/drain running through the site is under consideration.

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6.1 Remediation Options

Since asbestos can not be readily destroyed by either chemical or physical processes, removal and disposal by burial in a suitable landfill is the only option for remediation. Compaction or solidification (using cement or similar materials) may be used to make transport, handling and disposal easier or safer.

On-site disposal could be considered where a suitable location is available. If on-site disposal is used, a management program to ensure continuing security of the material would still be required, and "Former" contaminated site status would probably not be achieved. Using solidification prior to disposal might be considered adequate to achieve a "Former" status, but the cost of solidification is likely to be prohibitive.

Off-site disposal would cost a minimum of $50/tonne plus excavation, handling and cartage. If an average of 0.5m of fill was removed over an area of 3000m^2 (150m x 20m), the costs would probably be at least $100-120,000. With more extensive testing, it might be possible to more accurately delineate areas of significant contamination and to reduce the volume of material to be removed. These estimates are indicative only, and should not be relied upon for detailed costing.

The technical difficulties in demonstrating that remediation had achieved levels of asbestos below the current clean-up levels expected by the Department of Environment and Heritage might still prevent a "Former" contaminated site status being obtained even with off-site disposal. The proximity of a large quantity of similarly contaminated soil on the adjoining factory site makes it imperative that appropriate controls be implemented on that site as well as on the ACU site, in order to prevent re-contamination and to ensure that health risk controls by ACU are not rendered meaningless by transport of airborne asbestos across the boundary.

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Any earthmoving activities carried out in the area adjacent to the factory site and likely to disturb the existing soil should be carefully controlled to minimise the generation of dust. Monitoring should be put in place to check for asbestos fibres in air during the work, and work practices should be modified if levels in excess of safe limits are detected. Persons working in the area should be provided with appropriate personal protective equipment. Soil removed from the site should be sealed in lined trucks.

6.2 Management Options

Management of asbestos contamination in soil is often the most cost effective option, particularly when integrated with suitable site developments. Management is most appropriate in instances where a site is likely to remain under the continuing control of a single long-term owner. The ACU site would therefore be considered suitable for management options.

The objective for management of an asbestos contaminated site is to prevent the generation of airborne asbestos fibres, and to prevent transport of asbestos off the site where it might become airborne, thereby minimising the health risks to which the site occupants and other persons off-site are exposed.

Management options include:

- covering the contaminated soil with a layer of clean fill sufficient to prevent migration of the asbestos to the surface and to prevent excavation down to the contaminated soil

- covering the surface of the contaminated site with hard cover in the form of permanent buildings, car parks or roadways.

- implementing a management system in addition to physical barriers, which will prevent unauthorised subsurface intrusion on the site, and will ensure that all work is carried out in accordance with strict safety procedures to protect both workers, site occupants and the public.

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The construction of a sealed access road through the area and the piping and burying of the creek/drain presents the best option for management of the asbestos contamination. It is expected that this would involve hard surfacing of a large part of the area, and covering other areas with a layer of clean fill, possibly applied over a layer of geotextile to prevent migration of asbestos to the surface and to act as a warning barrier to anyone excavating in the area. A minimum depth of 1m of clean fill would probably be considered necessary if no other control measures were taken.

A rigorous hazard management plan to prevent unauthorised excavation and ensure adequate safety procedures should be implemented. This should conform to relevant sections of the Worksafe Australia Asbestos Code of Practice and Guidance Notes. Any excavated material should be disposed of only to an authorised landfill. All work should be undertaken using appropriate safeguards to prevent the generation of dust from the affected area, and the area should be monitored for levels of airborne asbestos during the work. Workers should wear appropriate personal protective equipment at all times. This would comprise as a minimum a half face particulate respirator conforming to Australian Standard AS1705: Selection Use and Maintenance of Respiratory Protection Devices. Depending on monitoring results, protective clothing may need to be worn and not removed from the site for home laundering.

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Although no evidence has been found of airborne asbestos which would indicate an immediate health risk, the presence of asbestos in the soil at the levels detected makes such conditions possible. Interim measures which should be taken to protect the health of university employees, students and occupants of neighbouring properties include:

- restrict entry to the area with barriers, fencing and/or signs warning of potential danger.

- ensure that all persons entering the area to perform any work which might generate dust (including mowing grass, earthmoving, landscaping) are aware of the potential hazards, and are required to wear a suitable dust mask and protective clothing at all times.

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- avoid any work in the area during periods of adverse weather and soil conditions: (dry soil, windy).

- prevent transport of asbestos in runoff outside the area of concern by maintaining groundcover on affected areas and using systems such as hay bales to deposit sediment from runoff before it enters the creek or leaves the site.

- have monitoring undertaken occasionally during any work on the site, including grass mowing, earthmoving, landscaping, to check for airborne asbestos levels, and also regular background air monitoring to confirm ambient levels.

- if airborne asbestos levels exceed the upper limit for ambient air in urban areas (0.01 fibres/mL) modify management controls accordingly.

Control of work in the area would be most effectively managed by implementing what is commonly known in industry as a work permit system. This would require all persons working in the area to obtain a written authority from a suitably trained and qualified person before commencing work. The authority would normally specify the hazards involved in undertaking the work, and the precautions to be taken. The area should be suitably signposted to warn of the need for an authority to enter or work in the area. The need for explicit signs warning about asbestos could then be avoided if necessary to avoid undue concern by site occupants or neighbours, although their use is still recommended. All signs should conform to the requirements of AS1319: Safety Signs for the Occupational Environment.

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7 Recommendations

It is recommended that the Department of Environment and Heritage be notified that asbestos has been detected on the site, so that it may be entered on the Contaminated Sites Register. This is required under the Contaminated Land Act 1991. RUST PPK can undertake the notification on behalf of the ACU if requested.

Until either a final remediation or management plan can be developed and put in place, it is recommended that the interim management measures detailed above be implemented.

The decision whether to attempt remediation of the site or to put a management system in place will depend on development plans for the site. A combination of remediation of some parts of the affected area, and management of others might provide the best economic alternative for minimising health risks and allowing continuing site use or development.

Based on the information available, management of the site is considered the most effective and economical means of ensuring that health hazards are minimised. A final decision should only be made after consultation with the Department of Environment and Heritage to confirm that the proposed course of action is acceptable.

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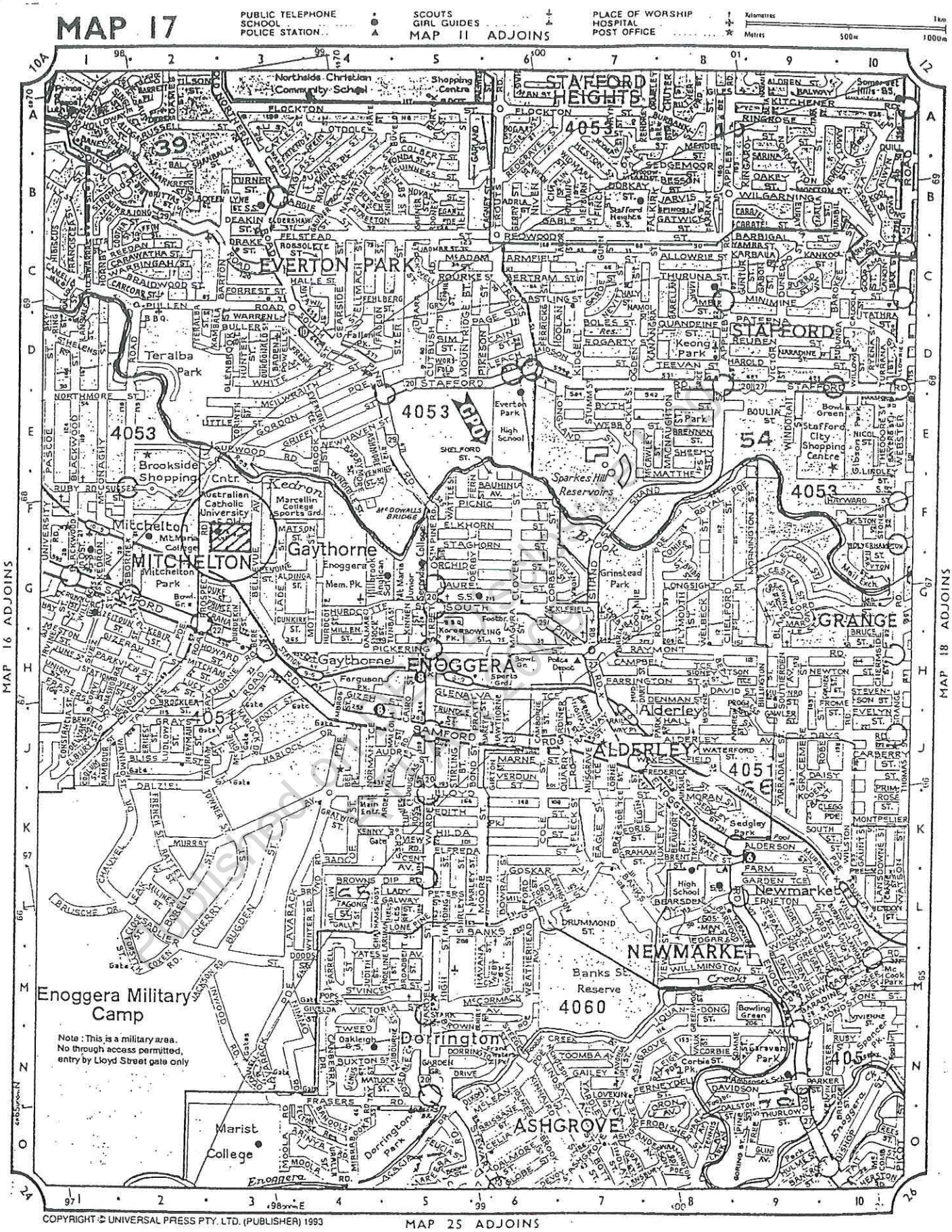
Appendix A

Site Location



Extracted from:
UBD Street Directory of Brisbane, 37th Edition

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Appendix B

Site Plan

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Appendix C

Sample Locations and Results

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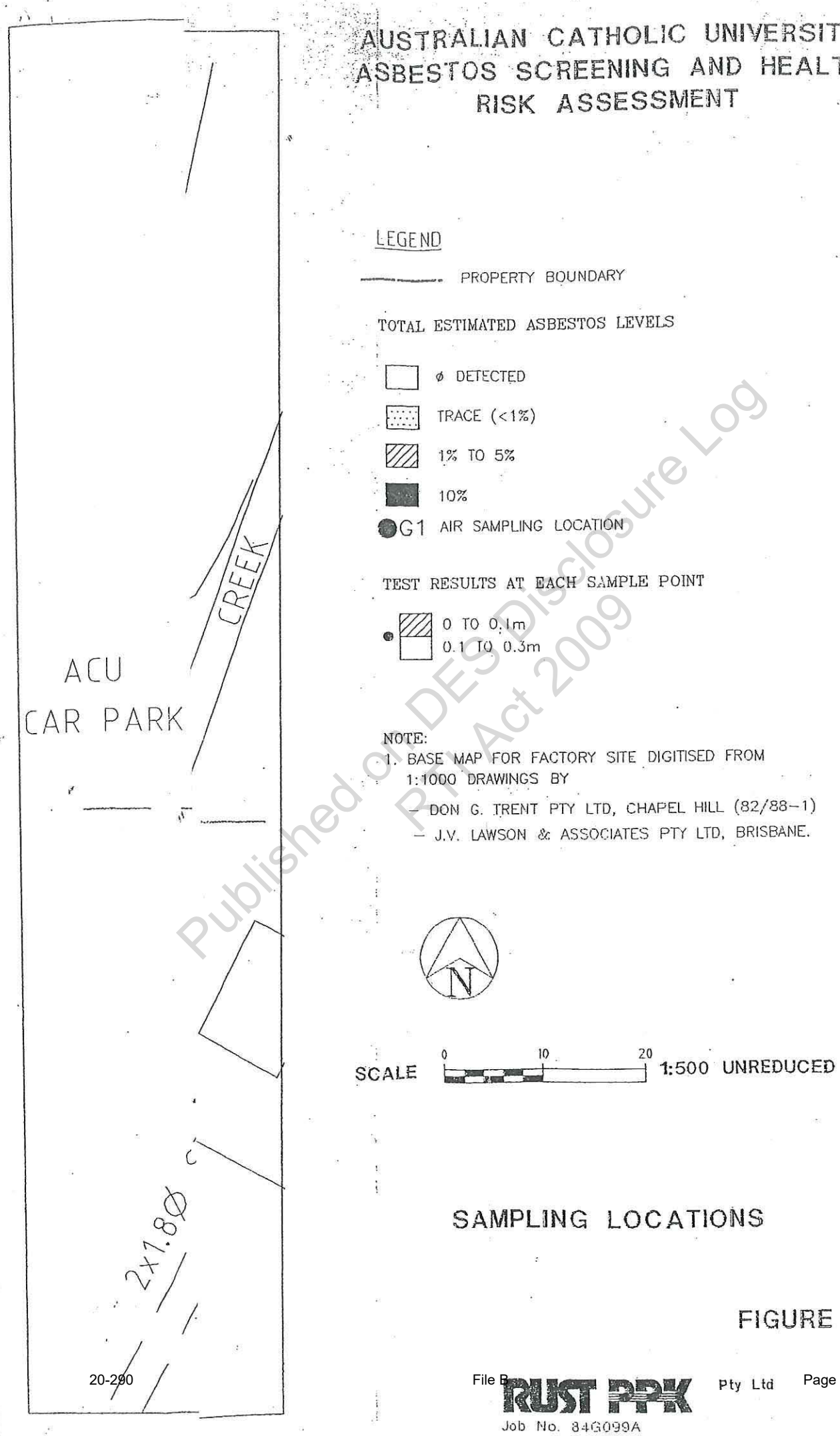
AUSTRALIAN CATHOLIC UNIVERSITY
ASBESTOS SCREENING AND HEALTH RISK ASSESSMENT



SAMPLING LOCATIONS

FIGURE 2

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Appendix D

Soil Sampling Results

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Enviro health

CONSULTING PTY. LTD.
A.C.N. 054 748 819
ENVIRONMENTAL & OCCUPATIONAL HAZARD MONITORING & ADVISORY

10 February 1995

Rust PPK Pty Ltd
348 Edward Street
Brisbane Qld 4000

Attention: sch4p4(6) Personal information

REPORT TITLE: Examination for the presence of asbestos

SAMPLE IDENTIFICATION: Twenty samples Job No. 84F099A

OUR REFERENCE: ECI-Q775A

YOUR REFERENCE: 84F099A

WORK REQUIRED: Microscope Examination for the presence of asbestos

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Reported by:

sch4p4(6) Personal information

Craig Carlson B.Sc.
Laboratory Manager

This report relates specifically to the sample tested

2nd Level, 391 Wickham Terrace
Spring Hill 4000
Phone: (07) 839 1122

EXAMINATION FOR THE PRESENCE OF ASBESTOS
REPORT ECI-Q775A

1.0 INTRODUCTION

Twenty samples as received were examined for the presence of asbestos.

2.0 PROCEDURE

The samples were examined using Polarised Light Microscopy and Stereo Microscopy (as outlined in laboratory method manual).

This report contains visually estimated percentages of asbestos minerals based on examination with a stereobinocular microscope. These estimates have large and variable errors depending on factors such as heterogenicity, the nature of the matrix and estimating volumes of fibres. The percentages should be considered as approximations at best and no guarantee can be given as to their accuracy.

3.0 RESULTS

3.1 Sample 1 ACU1 0.0 - 0.1
Description: The sample consisted of dark brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at trace levels.

3.2 Sample 2 ACU1 0.1 - 0.2
Description: The sample consisted of brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%.

3.3 Sample 3 ACU2 0.0 - 0.1
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%.

3.4 Sample 4 ACU2 0.1 - 0.3
Description: The sample consisted of reddish brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at trace levels.

3.5 Sample 5 ACU3 0.0 - 0.1
Description: The sample consisted of reddish brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected in the sample at trace levels.

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3.6 Sample 6 ACU3 0.1 - 0.3
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected in the sample at visually estimated percentages of 5% and 5% respectively.

3.7 Sample 7 ACU4 0.0 - 0.1
Description: The sample consisted of reddish brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%.

3.8 Sample 8 ACU4 0.1 - 0.3
Description: The sample consisted of grey brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%.

3.9 Sample 9 ACU5 0.0 - 0.1
Description: The sample consisted of light brown sandy loam.

Report: No asbestos fibres were detected by PLM.

3.10 Sample 10 ACU5 0.1 - 0.3
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%. Crocidolite asbestos fibres were detected in the sample at trace levels.

3.11 Sample 11 ACU6 0.0 - 0.1
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected in the sample at trace levels.

3.12 Sample 12 ACU6 0.1 - 0.3
Description: The sample consisted of light brown sandy loam and fine gravel.

Report: Chrysotile asbestos fibres were detected in the sample at trace levels.

3.13 Sample 13 ACU7 0.0 - 0.1
Description: The sample consisted of reddish brown sandy loam.

Report: Amosite asbestos fibres were detected in the sample at trace levels.

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3.14 Sample 14 ACU7 0.1 - 0.3
Description: The sample consisted of reddish brown sandy loam.

Report: No asbestos fibres were detected by PLM.

3.15 Sample 15 ACU8 0.0 - 0.1
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile and amosite asbestos fibres were detected in the sample at trace levels.

3.16 Sample 16 ACU8 0.1 - 0.3
Description: The sample consisted of reddish brown sandy loam.

Report: Amosite asbestos fibres were detected in the sample at trace levels.

3.17 Sample 17 ACU9 0.0 - 0.1
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile asbestos fibres were detected in the sample at trace levels.

3.18 Sample 18 ACU9 0.1 - 0.3
Description: The sample consisted of light brown sandy loam.

Report: Chrysotile, amosite and crocidolite asbestos fibres were detected in the sample at trace levels.

3.19 Sample 19 ACU10 0.0 - 0.1
Description: The sample consisted of dark brown loam.

Report: Chrysotile and amosite asbestos fibres were detected within the sample at a visually estimated percentage of <5%.

3.20 Sample 20 ACU10 0.1 - 0.3
Description: The sample consisted of dark brown loam.

Report: Chrysotile asbestos fibres were detected in the sample at trace levels.

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* "PLM - Polarised Light Microscopy"
** "Trace levels are ≥ 5 to < 100 fibres or fibre bundles.

Detection limit of > 5 fibres for detection of asbestos in soil using PLM.

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Appendix E

Air Sampling Results

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MISTFORD PTY LTD — ACN 050 406 650 — trading as

AIR MONITORING SERVICES

Registered Laboratory

Max Vines
Asbestos Technician

12 Falkirk Street,
Stafford Heights, Qld 4053
Telephone: (07) 350 2796
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Brisbane.

February 3, 1995.

Rust P.P.K. Pty. Ltd.,
348 Edward Street,
BRISBANE. QLD. 4000.

Attention: sch4p4(6) Personal information

Re: Air monitoring : 53 Prospect Road, Mitchelton.

Report No: 389 / 1 BACKGROUND MONITORING REPORT

AIR MONITORING ANALYSIS

1. INTRODUCTION

The samples were located at fixed locations as referenced below.

TEST METHOD: Filters examinied in accordance with 1988 NOHSC Code of Practice and Guidance Notes for Asbestos using The Membrane Filter Method,

TECHNICIAN: Max Vines.

EQUIPMENT: Dupont P2500A air samplers calibrated to 2 litres / min.
Nuclepore anti static filter holders, 22mm diameter.
Millipore type AAWG 025 00 filters.
Olympus CH-2 microscope.
Viewing Graticule No G 24. Diameter 100 micrometres.

2. RESULTS

Air Sampler Filter Identity	Commenced Monitoring	Finished Monitoring	Slide No	Location	RESULT Concentration fibres/mL
N 36	9.47 am	1.47 pm	10200	Western end of dirt road towards Prospect Road. 0 fibres / mL	<0.01
D 34	9.50 am	1.50 pm	10203	Eastern end of dirt road near creek 0 fibres / mL	<0.01
G 1	9.53 am	1.50 pm	10204	Halfway along dirt road on Southern side of road 0 fibres / mL	<0.01

sch4p4(6) Personal information

Max Vines.
Asbestos Technician

NB Sampling procedures. Locations not covered by NATA Registration

"This laboratory is registered by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of registration".
"This endorsement shall not be reproduced except in full.

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Appendix F

Sample Transmittals

Release

RUST PPK ENVIRONMENT & INFRASTRUCTURE

CHAIN OF CUSTODY RECORD

Sheet 1 of 3

Date: 23/01/95

Job Number: 84F099A

Field Technician: sch4p4(6) Personal information

Sample Number	Collection Date	Collection Time	Container Size	Preservative	Turnaround Time	Analysis Required
ACU1 0.0-0.1	23/01/95		PE/Bag	Nil		Asbestos in Soil (id + conc")
ACU1 0.1-0.2	"		"	"		"
ACU2 0.0-0.1	"		"	"		"
ACU2 0.1-0.3	"		"	"		"
ACU3 0.0-0.1	"		"	"		"
ACU3 0.1-0.3	"		"	"		"
ACU4 0.0-0.1	"		"	"		"
ACU4 0.1-0.3	"		"	"		"

Relinquished By: sch4p4(6) Personal information Received By: sch4p4(6) Personal information Date/Time: 23/01/95 17.30

Relinquished By: ..... Received By: ..... Date/Time: .....

Relinquished By: ..... Received By: ..... Date/Time: .....

Laboratory Name and Address:
Envirohealth
Lvl 2/391 Wickham Tce
SPRING HILL

Project Manager: sch4p4(6) Personal information

RUST PPK
IBM Centre
348 Edward Street, Brisbane
Queensland 4000 Australia
Telephone 61 7 831 6616
Facsimile 61 7 831 4223

Analysis Specification Sheet Attached: .....

Other Details: Exclude any pieces of ACM from samples subjected to analysis - free fibre capable of forming respirable dust only.

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RUST PPK ENVIRONMENT & INFRASTRUCTURE

CHAIN OF CUSTODY RECORD

Sheet 2 of 3

Date: 23/01/95

Job Number: S4 8099A

Field Technician: sch4p4(6) Personal information

Sample Number	Collection Date	Collection Time	Container Size	Preservative	Turnaround Time	Analysis Required
ACU5 0.0-0.1	23/01/95		Pl/Bag	NIL		Asbestos in Soil (id + conc")
ACU5 0.1-0.3	"		"	"		"
ACU6 0.0-0.1	"		"	"		"
ACU6 0.1-0.3	"		"	"		"
ACU7 0.0-0.1	"		"	"		"
ACU7 0.1-0.3	"		"	"		"
ACU8 0.0-0.1	"		"	"		"
ACU8 0.1-0.3	"		"	"		"

Relinquished By: sch4p4(6) Personal information Received By: sch4p4(6) Personal information Date/Time: 23/01/95 17.30

Relinquished By: ..... Received By: ..... Date/Time: .....

Relinquished By: ..... Received By: ..... Date/Time: .....

Laboratory Name and Address: Enviro health

Project Manager: sch4p4(6) Personal information

Analysis Specification Sheet Attached: .....

Other Details:

RUST PPK
IBM Centre
348 Edward Street, Brisbane
Queensland 4000 Australia
Telephone 61 7 831 6616
Facsimile 61 7 831 4223

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RUST PPK ENVIRONMENT & INFRASTRUCTURE

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

Date: 23/01/95

Job Number: 51.5099A

Field Technician: sch4p4(6) Personal information

Sample Number	Collection Date	Collection Time	Container Size	Preservative	Turnaround Time	Analysis Required
ACU 9 0.0-0.1	23/01/95		P.E./Bag	Nil		Asbestos in Soil (id+ conc)
ACU 9 0.1-0.3	"		"	"		"
ACU10 0.0-0.1	"		"	"		"
ACU10 0.1-0.3	"		"	"		"

Relinquished By: sch4p4(6) Personal information Received By: sch4p4(6) Personal information Date/Time: 23/01/95 17:30

Relinquished By: ..... Received By: ..... Date/Time: .....

Relinquished By: ..... Received By: ..... Date/Time: .....

Laboratory Name and Address: Envirolab P/L

Project Manager: sch4p4(6) Personal information

Analysis Specification Sheet Attached: .....

Other Details:

RUST PPK
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