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Report on

Pre-demolition / Pre-refurbishment, Hazardous
Building Materials Assessment
Nine Buildings, Base Hospital, Dubbo, NSW

Prepared for
Health Infrastructure

Project 72811.04



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Report on Pre-demolition / Pre-refurbishment Hazardous Buildings Assessment of Nine Buildings Dubbo Base Hospital, Dubbo, NSW

1. Introduction

This report describes the findings of an asbestos and other hazardous building materials (HBM) assessment of nine buildings conducted by Alan Lee of Douglas Partners (DP) at Dubbo Base Hospital, NSW, on 18-20 May 2016. The inspection was conducted in accordance with DP's proposal dated 4 February 2016, reference SYD151621. The inspection and report was commissioned by TSA Management Pty Ltd on behalf of Health Infrastructure.

The HBM inspection was carried out for the following buildings at the hospital:

- S Block
- G Ward
- George Hatch
- Old Maternity
- A&E, Imaging, Reception , Medical Records
- Myall Street Doctors Residence
- Playmates Cottage
- East / west walkway
- North / south walkway

The above areas are shown on Drawing 1 attached in Appendix D. These areas were defined by the client in the proposal.

The purpose of the survey was to comply with current regulations and enable management of asbestos-containing materials (ACM) and other HBM at the subject site. The assessment was conducted on the basis of the condition of the materials at the time of inspection and the future anticipated activities at the site.

Buildings were inspected to identify and record the type, location, condition and extent of HBM and involved collecting representative bulk samples from suspected ACM, and potential lead-containing paint where possible.

2. Scope of Work

The scope of the HBM survey included:

- Site inspection to identify HBM materials in the accessible areas of the subject buildings. HBM includes ACM, synthetic mineral fibre (SMF) products, lead-containing paint (LCP) and polychlorinated biphenyls (PCBs) contained in capacitors in fluorescent light fittings.
- Where accessible, collect samples of building materials suspected of or commonly known to contain hazardous material (e.g. asbestos materials, potential lead-containing paint). SMF installations and PCB-containing items are identified by visual assessment.
- Submit building material samples to a NATA-accredited laboratory for analysis, document the results and provide photographs of positive findings.

No survey inspection can be guaranteed to locate all asbestos and other hazardous materials without extensive destruction of the building and, therefore, this assessment cannot be regarded as absolute. Planned or future demolition of, and/or renovation to, site structures may expose situations which were concealed or otherwise impractical to access during this assessment. The client should be aware that asbestos ceilings and panels, *etc*, may conceal further ACM such as, for example, asbestos-insulated duct or lagged pipework. Removal of asbestos products to identify concealed ACM requires additional controlled conditions and is beyond the scope of a normally-executed survey.

3. Previous Reports of Asbestos at the Site

Three previous survey reports on the occurrence of asbestos at the hospital have been completed, and also one Asbestos Management Plan, as follows:

1 HLA-Envirosciences (2003) *Draft Asbestos Survey and Register*.

This report described a survey for asbestos of 30 buildings at the hospital. Some of the report is now redundant as some buildings, such as the laundry and boiler, have subsequently been demolished. Information in the report should be current for the older buildings at the site including the George Hatch building;

2 Western NSW Local Health District (2014) *Asbestos Register, Dubbo Health Service*.

This report was prepared by Mr Adrian Battistel and included a survey for asbestos within 37 buildings and structures at the hospital. Information in the report should be current for all the buildings at the site.

- 3 Douglas Partners (2012) *Hazardous Building Materials Assessment – Main Works, Dubbo Base Hospital, Myall Street, Dubbo*. Project 72811.00.Rev 1.

This report comprised consideration of HBM within the old Maternity Building (only) of the hospital. This 2012 report is now superseded by information in this current report.

- 4 HLA-Envirosciences (2003) *Asbestos Management Plan*.

This report described various procedures for management, monitoring, removal *etc* of ACM at the hospital.

3. Site Description

At the time of inspection the buildings were described as follows:

- **S Block** and is a relatively modern brick veneer / metal roof / glass / plasterboard structure. At the time of the inspection, it was fully operational for hospital purposes;
- **G Ward** was similarly opened in approximately 2000 and is a modern brick veneer / metal roof / glass / plasterboard structure. Its relatively recent construction was after the period of use of ACM. At the time of the inspection it was fully operational for hospital purposes;
- **George Hatch Building** (Education Health and Library) is an older building constructed before 1990. It appears to be cavity brick of two main ages with many rendered brick internal walls. At the time of the inspection it was fully operational for various training and administration purposes;
- **Old Maternity** is an older building constructed before 1990. It is brick veneer with mainly plasterboard internal walls. At the time of the inspection it was vacant;
- **A&E, Imaging, Reception, Medical Records** was opened in 1998 and is a modern brick veneer / metal roof / glass / plasterboard structure. Its relatively recent construction was after the period of use of asbestos-containing materials (ACM). At the time of the inspection it was fully operational for hospital purposes;
- **Myall Street Doctors Residence** is an older building constructed before 1990. It is brick veneer with mainly plasterboard internal walls. At the time of the inspection it was fully operational as temporary accommodation for doctors;
- **Playmates Cottage** is an older building constructed before 1990. It is brick veneer with mainly plasterboard internal walls. At the time of the inspection it was fully operational as a child care centre;
- **East / west and North / south walkways** are both older buildings constructed before 1990. They are brick veneer / glass with mainly plasterboard internal walls. At the time of the inspection they were fully operational as covered corridors for pedestrian access between buildings

4. Fieldwork Methodology

4.1 Inspection Methods

Nominated buildings were surveyed systematically to identify the type, location and condition of asbestos and other hazardous building materials.

Standard sampling was restricted to areas that were reasonably accessible, and was essentially non-invasive and non-destructive. This type of survey does not extend to searching for concealed ACM in cavity walls, within concrete encased structural beams, below floorboards, behind ACM, above solid plaster ceilings or any other locations which, to access, would cause damage to fixtures, fittings, structure or decorative finishes.

Locations where access restrictions occurred during the survey were as follows:

- Access was limited in all the occupied buildings, especially those that were being actively used for medical purposes, eg Accident and Emergency, intensive care, recovery wards etc;
- Lifts and their brake cables were not accessible. These existed only in the George Hatch and Old Maternity buildings;
- Air conditioning ducting was not inspected (refer to section 5.1);
- Internal cores of fire doors were generally not inspected except for the fire door at the entrance of the old Maternity building, which did not appear to contain asbestos. All fire doors should be assumed to contain asbestos cores unless this is demonstrated otherwise;
- External laminates of spandrels were not inspected or sampled because of resulting damage that would be caused;
- All the below-ground trenches containing pipe lagging around services were not inspected except in easily-accessible locations;
- Ceiling spaces were inspected where reasonably accessible and safe to do so, however, where it was known that asbestos lagged pipes existed in ceilings such as in the upper level of George Hatch building, this was not inspected;
- Other places where previous surveys had identified that friable asbestos was known to exist were not inspected.

4.2 Sampling Methodology

All samples were taken according to DP field procedures HAZSAMP. Asbestos bulk samples were obtained using fibre suppressant techniques in order to minimise fibre release, and by breaking small portions from the bulk of the suspected ACM using hand tools. LCP samples are taken by scraping off paint from the suspect area using hand tools.

Sampling tools were decontaminated prior to collecting each sample in accordance with DP field procedures HAZDEC. The collected samples were recorded; placed in sealed, labelled plastic bags, and; sent to a laboratory accredited by NATA to ISO/IEC 17025 for the scientific identification

methods of analysis. For similar or repetitive building elements, a representative bulk sampling protocol was adopted following visual examination and assessment.

SMF materials were identified by visual inspection, only.

Serial numbers of capacitors in lift switch machinery or fluorescent light capacitors were recorded only where it is safe to do so, and the details of the capacitor identified within was checked against the 1997 ANZECC register for *Identification of PCB-Containing Capacitors*. Only one of each type of fluorescent light fitting was inspected.

4.3 Analytical Methods

Asbestos materials were identified qualitatively in the laboratory by polarised light microscopy (PLM) in conjunction with dispersion staining, in accordance with AS: 4964-2004 *Method for the qualitative identification of asbestos in bulk samples*.

Testing of a paint sample for lead content involved the quantitative analysis of lead following sample digestion using ICP-AES/MS, ICP-OES and/or CV/AAS.

All laboratory analytical methods are NATA endorsed. Certificates of laboratory analysis are attached in Appendix E.

5. Results of the Survey Assessment

5.1 ACM Identified

ACM was identified in all buildings except A&E / Imaging and G Ward. Both these latter buildings were constructed in 1998-2000, which is after the period of main use of ACM.

The most hazardous situation of asbestos identified is in the form of lagging around pipelines and other structures. This friable material has been used for heat insulation around redundant pipelines and holding tanks that were associated with hot water or steam lines connecting with the former boiler at the hospital.

The lagging material has become degraded in some situations and has broken off the pipelines and fallen on the ground as loose material. Potential for asbestos fibres to become airborne in these situations is considered to be high, and access to these areas must remain restricted.

A particular risk area noted is in the below-ground trench on the northern side of the E / W Walkway, where lagged pipes can be seen from the ground surface through gaps between the concrete cover panels. This location is recommended to be remediated by adding more effective cover.

Asbestos also exists in fibre cement sheeting used as panelling on many walls, ceilings, soffits etc within the buildings surveyed. It is unknown if this material is bonded and contains approximately 15

percent asbestos, or if it consists of friable 'Low Density Board' and contains up to 70 percent asbestos. More widespread sampling and laboratory analysis will be needed at the stage of demolition and / or refurbishment to determine the specific type of this material so that suitable removal methods will be used.

A widespread situation of ACM in sheeting at the site is within 'spandrels', which are pale green panels along the walls of many of the buildings, and both walkways, assessed. These panels are three-layered laminates that comprise two layers of ACM sheeting outside a central panel of polystyrene. This material would have good heat insulation properties.

Asbestos was also identified within vinyl floor sheeting and vinyl tiles in several buildings. Several styles of vinyl floor coverings are present at the site, and most types were sampled and tested.

Within the buildings surveyed there were several plant rooms which contain various motors, pumps, compressors *etc*, mainly for air conditioning. Most of this machinery is operational, but some is redundant, such as in the old Maternity Building. It is considered that gaskets in machinery in S Block, G Ward and the A&E building have a low risk of containing asbestos, but gaskets in the other, older, buildings have a higher risk of containing asbestos. All gaskets in these other buildings should be assumed to contain asbestos.

There are no electrical heater banks in air conditioning ducting within the buildings surveyed at the hospital and, therefore, no asbestos millboard exists within the ducting (pers. comm. Mr Brian Cusack¹).

All buildings surveyed had metal sheeting on roofs.

Only limited labelling for asbestos was noted on the occurrences of ACM, and most occurrences were not labelled.

The old Maternity building was inspected as part of the current project, and this current report and Asbestos Register supersedes information in the previous DP (2012) report.

An Asbestos Register was prepared for this assessment, and it is attached in Appendix B.

5.2 Synthetic Mineral Fibre

SMF was widely observed as thermal lagging immediately under metal roof sheeting, and on top of some ceilings, of all buildings surveyed. It is also used intermittently as pipe lagging. It is not considered to be possible to describe every occurrence of SMF at the site.

All the SMF observed was in relatively good condition.

¹ Senior Engineer, Manager Maintenance Services, Dubbo Base Hospital

5.3 Lead-based Paint

All the buildings except for George Hatch and the Maternity Building, appeared to have been painted within the last ten years, and paintwork was generally in good condition.

Paint work on the outside of the windows / doors *etc* of the George Hatch building was in particularly degraded condition, and these areas had obviously not been painted for 20-30 years. A sample of paint flakes was taken from a window of the southern side of the George Hatch building and analysed for lead. The result was 70,200 mg/kg of lead, or 7 percent, which indicates lead paint. The Certificate of Analysis is attached in Appendix E.

The recommended amount of lead in domestic paint declined from 50 per cent before 1965 to 1 per cent in 1965. In 1992, it was reduced to 0.25 per cent, and in 1997 it was further reduced to 0.1 per cent.

5.4 PCBs

Information was provided by Mr Brian Cusack (*pers. Comm.*) that all capacitors containing PCBs were removed from fluorescent light fittings in all buildings at the hospital at least 25 years ago.

6. Conclusions and Recommendations

The following conclusions are made:

- Asbestos, SMF and lead-containing paint are considered to exist in one or more of the buildings surveyed. Asbestos occurrences are listed in the Asbestos Register in Appendix B, and SMF is widely distributed as thermal insulation under metal roofs, on top of ceiling panelling, and as distinct pipe lagging in some locations;
- No PCBs are understood to exist in any light fittings within buildings surveyed, or at the hospital generally;
- Lead in paint was identified on window frames of the George Hatch building. Remnant leaded paint may create a dust hazard. At present, the paint surfaces are flaked, but on dislodgement by the action of wind or rain, may cause the formation of hazardous dust.

6.1 Recommendations

The following recommendations are made:

- All occurrences of asbestos are recommended to be labelled in accordance with statutory requirements, except where labelling would cause undue concern to visiting members of the public;
- The effective isolation of all occurrences of friable asbestos be checked and upgraded where necessary;
- The previous Asbestos Management Plan (2003) be updated, as it is now out of date;
- Any occurrences of external paintwork of a similar age to sampled from the George Hatch building should be tested for the presence of lead;
- Depending on the intended refurbishment or demolition of the George Hatch building, external timber work covered with lead-containing paint should be carefully removed, or otherwise managed to reduce any risk from dust-borne lead.

7. Limitations

Douglas Partners (DP) has prepared this report for a project at Dubbo Hospital, NSW in accordance with DP's proposal dated 4 February 2016, reference SYD151621. The inspection and report was commissioned by TSA Management Pty Ltd on behalf of Health Infrastructure.

The project was carried out under a Health Infrastructure agreement. The report is provided for the use of HI. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

Results provided in the report are indicative of the conditions observed on the date of inspection. Changes may occur after DP's inspection and field testing has been completed. Whilst the surveyors make every reasonable effort, DP cannot guarantee that every ACM has been identified and survey results are definitive. Assessments that are effectively management compliance surveys are non-destructive and as such are not intended for use or referral for the purposes of demolition or refurbishment.

In the event of future demolition, refurbishment, renovation, decommissioning or structural alterations, further investigation by a competent person, which may entail invasive or destructive survey techniques, must be undertaken. Some ACM could be present in the building that may only be discovered by extensive invasion of structures, or when the building is subject to demolition or major refurbishment works.

DP's advice is based upon the conditions encountered during this investigation and by the scope and feasibility of the investigations based on accessibility and other limitations. The accuracy of the

advice provided by DP in this report may be limited by inaccessible areas and differing conditions between observed locations. The advice may also be limited by budget constraints imposed by others, the scope of works undertaken as a result, or by site accessibility. This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

The sampling regime is dictated by the building nature. Sufficient representative bulk samples were taken throughout the building i.e. one like sample per consistent material type, situation or item. It is advisable to assume that materials similar to those positively identified as asbestos also contain asbestos until proven to be otherwise. It should not automatically be assumed that materials similar in appearance to those tested and found not to contain asbestos also do not contain asbestos. Due to the very low concentration of asbestos fibres and the non-homogenous matrix of vinyl floor tiles, false negative results may be obtained. With some asbestos containing bulk material it can be very difficult or impossible to detect the presence of asbestos using the polarised light microscopy analytical method, even after ashing or disintegration of samples. This is due to the small length or diameter of asbestos fibres present in the material, or attributed to the fact that very fine fibres have been dispersed individually throughout the material.

Any areas within the scope of the survey but not described within the body of the report or in the asbestos and other hazardous materials register should be regarded by the client as not having been surveyed, and thus may potentially contain ACM. A competent person should assess such areas before any work affecting them is carried out.

It must be assumed that building materials visually assessed as asbestos contain amphibole asbestos, until sampled and laboratory analysis proves otherwise. All areas where access was not possible must also be assumed to contain asbestos until proven otherwise. Sub-surface drains, pipes and formwork or surrounds may be constructed of asbestos cement but sub-surface areas are not accessed. Any sub-surface pipes, particularly those constructed of cement should be assumed to contain asbestos until proven otherwise.

The scope of this survey does not include the identification of ACM in many of the following building areas (including areas not routinely examined for safety reasons):

Ceiling voids

Ceiling voids are not generally checked in occupied areas for safety reasons. Entering a ceiling void carries a risk of fibre release from the disturbance of any ACM within it. Ceiling voids may only be checked in unoccupied areas where safe access is available.

Wall cavities

May be completely blocked or bricked in, or concealed by decorative features and finishes.

Risers

Often completely blocked or bricked in. An assessment will be made of the risk and risers may only be checked in unoccupied areas where safe access is available.

Fitted carpets

Fitted carpets are not lifted due to the risk of damage and relaying them satisfactorily. They may conceal ACM, such as asbestos-containing flooring materials or void access points.

Beneath floor boards

ACM may be present beneath floorboards. Floorboards are not lifted as part of standard surveys unless specifically required and prior arrangements have been made.

Floor voids

May be completely enclosed.

Windows

ACM can be located above, below windows or surrounding window frames and are often inaccessible.

Columns

These will not be examined if doing so will cause decorative damage.

Plaster ceilings

If access above cannot be made without utilising destructive techniques then the void above cannot be examined.

Roof, high level and external areas

These will not be examined if safe access cannot be achieved.

Confined spaces

These will not be examined if safe access cannot be achieved.

Restricted access

Building areas subject to specialist access requirements will not be examined unless prior arrangements have been made with the client.

Ductwork

May contain ACM internally that is not accessible until the ducting is disassembled.

Fire doors

May contain ACM internally. Partial disassembly for inspection may compromise the fire rating of the door and is not normally undertaken.

Lift shafts

These will not be examined for safety reasons unless a lift engineer accompanies the surveyor. The recommendations and conclusions contained in this report shall not abrogate a person of their responsibility to work in accordance with Statutory Requirements, Codes of Practice, Guidelines, Material Safety Data Sheets, Work Instructions, or industry best practices.

8. Legislation and References

Work Health and Safety Act and Regulations 2011 (Commonwealth, NSW, ACT & QLD).

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Inspection Report

Douglas Partners



Introduction

These notes are provided to amplify DP's inspection report in regard to the limitations of carrying out inspection work. Not all notes are necessarily relevant to this report.

Standards

This inspection report has been prepared by qualified personnel to current engineering standards of interpretation and analysis.

Copyright and Limits of Use

This inspection report is the property of DP and is provided for the exclusive use of the client for the specific project and purpose as described in the report. It should not be used by a third party for any purpose other than to confirm that the construction works addressed in the report have been inspected as described. Use of the inspection report is limited in accordance with the Conditions of Engagement for the commission.

DP does not undertake to guarantee the works of the contractors or relieve them of their responsibility to produce a completed product conforming to the design.

Reports

This inspection report may include advice or opinion that is based on engineering and/or geological interpretation, information provided by the client or the client's agent, and information gained from:

- an investigation report for the project (if available to DP);
- inspection of the work, exposed ground conditions, excavation spoil and performance of excavating equipment while DP was on site;
- investigation and testing that was carried out during the site inspection;
- anecdotal information provided by authoritative site personnel; and

- DP's experience and knowledge of local geology.

Such information may be limited by the frequency of any inspection or testing that was able to be practically carried out, including possible site or cost constraints imposed by the client/contractor(s). For these reasons, the reliability of this inspection report is limited by the scope of information on which it relies.

Every care is taken with the inspection report as it relates to interpretation of subsurface conditions and any recommendations or suggestions for construction or design. However, DP cannot anticipate or assume responsibility for:

- unexpected variations in subsurface conditions that are not evident from the inspection; and
- the actions of contractors responding to commercial pressures.

Should these issues occur, then additional advice should be sought from DP and, if required, amendments made.

This inspection report must be read in conjunction with any attached information. This inspection report should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions from review by others of this inspection report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this inspection report.

Appendix B

Asbestos Register

Asbestos Register, Nine Buildings, Base Hospital, Dubbo, NSW

No.	Building Name	Floor of Building	Location	Material	Asbestos Type	Photo No.	Sample Test Result	Comments
1	S Block	External	Window Spandrels	Double (laminated) flat sheeting	Assume asbestos	-	-	Good condition
2	S Block	Lower Ground	Clarifier room	Asbestos insulation	Friable	1, 2	-	Fair condition, remain isolated
3	S Block	Lower Ground	Clarifier room	Pipe lagging	Friable	3	-	Fair condition, remain isolated
4	S Block	Lower Ground	Clarifier room	Asbestos waste	Friable	4	-	Poor condition, restrict access
5	S Block	Lower Ground	Clarifier room	Switchboard backing board, possible Bakelite switches	Bonded	5, 6	-	Good condition
6	S Block	External, below ground	Southern side of building	Pipe lagging	Friable	-	-	Poor condition, restrict access
7	S Block	Upper level	Plant room	Gaskets in machinery	Assume asbestos	-	-	Not observed but possible
8	S Block	Ground level	Flashing under eaves, top of brick wall	Flat sheeting	Assume asbestos	7	-	Good condition
9	A&E, Imaging, Reception and Records	Ground level	-	No asbestos noted	-	-	-	Recent construction
10	G Block	Ground level	-	No asbestos noted	-	-	-	Recent construction
11	George Hatch	Level 1	Ceiling space	Pipe lagging	Friable	-	-	Poor condition, restrict access
12	George Hatch	Level 1	Soffit	Flat sheeting	Assume asbestos	8	-	Fair condition
13	George Hatch	Level 1	Ceiling panelling of three enclosed verandas	Flat sheeting	Assume asbestos	9	-	Good condition

No.	Building Name	Floor of Building	Location	Material	Asbestos Type	Photo No.	Sample Test Result	Comments
14	George Hatch	Level 1	Roof covering of plant room in NE corner of building	Black bituminous material	Assume asbestos	-	-	Degraded in poor condition, restrict access
15	George Hatch	Level 1	Overhead services ducting	Pipe lagging	Friable	10	-	Good condition, restrict access
16	George Hatch	Ground level	Ceiling panelling of rear porch	Flat sheeting	Assume asbestos	-	-	Good condition
17	George Hatch	Ground level	Ceilings of bathrooms and toilets	Flat sheeting	Assume asbestos	-	-	Good condition
18	George Hatch	Ground level	Mid building near heater	Vinyl floor tiles		11	NAD, SMF	Good condition
19	George Hatch	Ground level	Plant room	Pipe lagging	Friable	12	-	Fair condition, remain isolated
20	George Hatch	Ground level	Plant room	Gaskets in machinery	Assume asbestos	-	-	Not observed but possible
21	George Hatch	Under floor	Possible packing on top of stumps	Sheeting fragments	Bonded	-	-	Not observed but possible
22	Maternity	Ground level	Ceiling panelling under the entry porch	Flat sheeting	Assume asbestos	13	-	Fair condition, remain isolated
23	Maternity	Level 1	Plant room upper doorway and ceiling	Flat sheeting	Assume asbestos	14	-	Fair condition, remain isolated
24	Maternity	Level 1	East end, nursery area	Vinyl floor tiles, old, lower layer	Bonded	15	NAD, SMF	Good condition
25	Maternity	Level 1	East end, nursery area	Vinyl floor tiles, new, upper	Bonded	15	CH, SMF	Good condition
26	Maternity	Ground	Room 80/8	Vinyl floor tiles	Bonded	16	NAD, SMF	Good condition
27	Maternity	Ground	Room 80/9	Vinyl floor tiles	Bonded	-	CH	Good condition
28	Maternity	Level 1	Above fire hose reel	Flat sheeting	Assume asbestos	17	-	Good condition

No.	Building Name	Floor of Building	Location	Material	Asbestos Type	Photo No.	Sample Test Result	Comments
29	Maternity	Level 1	Plant room	Gaskets in machinery	-	18	NAD, SMF, OF	Fair condition, remain isolated
30	Maternity	Ground floor	Lift room	Electrical switches, backing board, possible Bakelite switches	Assume asbestos	19	-	Good condition
31	Maternity	Ground floor	Lift room	Ventilation control box, backing board possible Bakelite switches	Assume asbestos	20	-	Good condition
32	Maternity	Ground floor	Lift room	Cover for services pipeline, flat sheeting	Assume asbestos	21	-	Good condition
33	Maternity	Ground floor	Main switch board	Backing board, possible Bakelite switches	Assume asbestos	22, 23	-	Good condition
34	Maternity	External	Soffit	Flat sheeting	Assume asbestos	24	-	Fair condition, do not disturb without controls
35	Maternity	External	Spandrels	Double (laminated) flat sheeting	Assume asbestos	25	-	Good condition
36	Maternity	External	Underground services trench	Pipe lagging	Assume asbestos	-	-	Poor condition, restrict access
37	Doctors accom.	Ground	Front verandah ceiling panelling	Flat sheeting	Assume asbestos	-	-	Good condition
38	Doctors accom.	Ground	Window infills	Flat sheeting	Assume asbestos	-	-	Good condition
39	Doctors accom.	Ground	Back verandah window lining	Flat sheeting	Assume asbestos	-	-	Good condition
40	Doctors accom.	Ground	Bathroom walls up to 1800 mm	Flat sheeting	Assume asbestos	26	-	Good condition
41	Doctors accom.	Ground	Garage ceiling lining	Flat sheeting	Assume asbestos	-	-	Good condition
42	Doctors accom.	Ground	Switchboard	Backing board, possible Bakelite switches	Assume asbestos	27	-	Good condition

No.	Building Name	Floor of Building	Location	Material	Asbestos Type	Photo No.	Sample Test Result	Comments
43	Doctors accom.	Ground	Fireplace and exhaust chimney	Insulation	Assume asbestos	28	-	Not observed but possible
44	Child Care Centre	Ground, external	Ceiling panelling under entry porch	Flat sheeting	Assume asbestos	29	-	Good condition
45	Child Care Centre	Ground, external	Fascia panelling	Flat sheeting	Assume asbestos	30	-	Fair condition, do not disturb without controls
46	Child Care Centre	Ground	Ceiling panelling, verandah	Flat sheeting	Assume asbestos	31	-	Good condition
47	Child Care Centre	Ground	Ceiling panelling, babies room	Flat sheeting	Assume asbestos	32	-	Good condition
48	Child Care Centre	Ground	Ceiling panelling, pre-schoolers room	Flat sheeting	Assume asbestos	-	-	Good condition
49	East / west walkway	Ground	Green wall panels (44 panels)	Double (laminated) flat sheeting	Assume asbestos	33	-	Good condition
50	East / west walkway	Ground	Mid of walkway near external door on northern side	Vinyl floor tiles	Bonded	-	CH	Good condition
51	East / west walkway	External	Adjoining wall of nursing admin	Flat sheeting (painted brown)	Unknown	34	CH, A	Good condition
52	East / west walkway	External	Adjoining Telstra pits x 2	Moulded form of pit	Unknown	35	-	Good condition
53	East / west walkway	External, below ground	Service trench on northern side	Pipe lagging	Friable	36	-	Poor condition, restrict access

No.	Building Name	Floor of Building	Location	Material	Asbestos Type	Photo No.	Sample Test Result	Comments
54	North / south walkway	Ground	Green wall panels (98 panels)	Double (laminated) flat sheeting	Assume asbestos	37	-	Good condition

Notes

CH, A Chrysotile Asbestos, Amosite Asbestos

NAD, SMF, OF No Asbestos Detected, Synthetic Mineral Fibre, Organic Fibre

Appendix C

Site Photographs



Photograph 1: S Block, Clarifier Room, asbestos insulation



Photograph 2: S Block, Clarifier Room



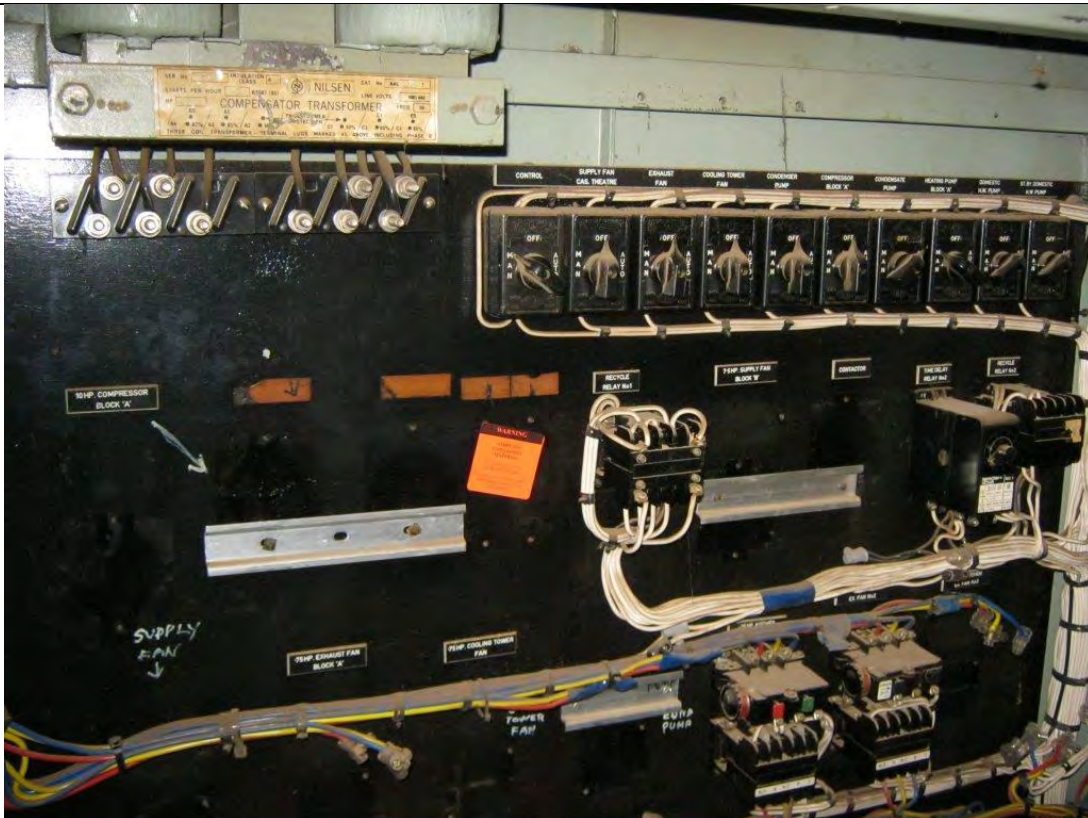
Photograph 3: S Block, Clarifier Room, asbestos pipe lagging



Photograph 4: S Block, Clarifier Room, asbestos waste



Photograph 5: S Block, Clarifier Room, main switchboard



Photograph 6: S Block, Clarifier Room, main switchboard, asbestos label



Photograph 7: S Block, Flashing under eaves



Photograph 8: George Hatch, Soffit



Photograph 9: George Hatch, sheeting under ceiling in enclosed verandahs



Photograph 10: George Hatch, overhead services ducting, asbestos pipe lagging



Photograph 11: George Hatch, vinyl floor tile (NAD)



Photograph 12: George Hatch, plant room, asbestos pipe lagging



Photograph 13: Maternity, ceiling panelling



Photograph 14: Maternity, plant room walls and ceiling



Photograph 15: Maternity, old and new vinyl floor tiles



Photograph 16: Maternity, vinyl floor tiles room 80/8



Photograph 17: Maternity, above fire reel



Photograph 18: Maternity, gasket in machinery (NAD)



Photograph 19: Maternity, lift room, electrical board



Photograph 20: Maternity, lift room, ventilation control board



Photograph 21: Maternity, lift room, cover for services



Photograph 22: Maternity, main electrical board (outside)



Photograph 23: Maternity, main electrical board (inside)



Photograph 24: Maternity, soffit



Photograph 25: Maternity, green spandrels



Photograph 2611: Doctors accommodation, bathroom walls



Photograph 27: Doctors accommodation, electrical switchboard, with asbestos label



Photograph 28: Doctors accommodation, exhaust chimney in garge



Photograph 29: Playmates Cottage, ceiling to front entry porch



Photograph 3012: Playmates Cottage, fascia panelling



Photograph 31: Playmates Cottage, ceiling panelling to veranda



Photograph 3213: Playmates Cottage, ceiling panelling, babies room



Photograph 33: East / west walkway, wall panels



Photograph 34: East / west walkway, adjoining nurses admin



Photograph 35: East / west walkway, Telstra pits (one of three)



Photograph 36: East / west walkway, belowground trench



Photograph 37: North / south walkway, green wall panels



Photograph 38: George Hatch, flaking paint on southern windows

Appendix D

Drawing



CLIENT: Health Infrastructure

OFFICE: Sydney

DATE: 3 Jun 2016

Hazmat Survey Areas

New Entrance Building

Dubbo Hospital Stages 3 & 4

PROJECT No: 72811.04

DWG No: 1

REVISION: 0

Appendix E

Laboratory Reports



**PARSONS
BRINCKERHOFF**

SAMPLE SUBMISSION FORM

ASBESTOS IDENTIFICATION

~~LEAD IDENTIFICATION~~

Client	Douglas Partners Pty Ltd		
Contact	Alan Lee	Region	Brisbane office
Address	439 Montague Rd, West End QLD 4101	Phone No.	3237 8900, 0413 886 050
		Email	alan.lee@douglaspartners.com.au
		Order Number	DP Job No. 72811.04

NAME OF SITE SURVEYED	Buildings in Dubbo Hospital
------------------------------	-----------------------------

SAMPLE SEQUENCE															
FROM	1							TO	8						

TOTAL SAMPLES SENT	8	Date sampled:	18-20 May 2016
		Date results required:	28 May 2016

SAMPLE LOCATIONS

Sample No.	Building	Sample Name
1	Nursing Admin, NE corner external wall	Fibrous cement sheeting
2	Corridor E / W	Vinyl floor tile
3	G. Hatch, G / Floor, 4 way middle near heater	Vinyl floor tile
4	Old maternity, 1 st Floor, Lower layer	Vinyl floor tile
5	Old maternity, 1 st Floor, Top layer	Vinyl floor tile
6	Maternity, 80-9, Gr. Floor	Vinyl floor tile
7	Maternity, 80-8, Gr. Floor Nurses store	Vinyl floor tile
8	Old Maternity, Bottom Plant Room	Gasket

ADDITIONAL COMMENTS



SAMPLE SUBMISSION FORM

PAYMENT METHOD:

Cheque

* Credit Card

Invoice

*Credit card details should not be written on this form. You will be contacted to provide the details telephonically.

PLEASE SEND ALL SAMPLES TO:

Parsons Brinckerhoff

Level 3, Northbank Plaza
69 Ann St, Brisbane QLD 4001

Phone: (07) 3854 6200

Fax: (07) 3854 6500

PB OFFICE USE ONLY	
Number of Samples Received:	
Date Samples Received:	
Samples Checked by:	

Note: It is recommended that you photocopy this form and retain for your records

Certificate of Analysis

<u>CLIENT:</u>	Douglas Partners	<u>CERTIFICATE NO:</u>	2160856E-0005
<u>CLIENT ADDRESS:</u>	439 Montague Road WEST END QLD 4101	<u>DATES SAMPLED:</u>	18/05/2016 to 20/05/2016
<u>TELEPHONE:</u>	0413 886 050	<u>DATE RECEIVED:</u>	25/05/2016
<u>FAX / E-MAIL:</u>	alan.lee@douglaspartners.com.au	<u>DATE ANALYSED:</u>	27/05/2016
<u>CONTACT:</u>	Alan Lee	<u>ORDER NUMBER:</u>	DP Job No. 72811.04
<u>LOCATION:</u>	Dubbo Hospital Buildings	<u>SAMPLED BY:</u>	As Received

TEST METHOD: Qualitative identification of asbestos types in bulk samples at Parsons Brinckerhoff Brisbane Laboratory by polarised light microscopy, including dispersion staining techniques using Parsons Brinckerhoff in-house method No.1, AS4964 (2004) and NATA accreditation No. 9607. This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC:17025. The results of tests, calibrations and or measurements included in this document are traceable to Australian/national standards.

<u>Lab Number</u>	<u>Sample Id</u>	<u>Sample Description</u>	<u>Sample Dimensions</u> cm	<u>Identification Type</u>
M001	Nursing admin, NE corner, external wall	Fibre Cement Sheet	3 x 3	CH, A
M002	Corridor EW	Vinyl Tiles	4 x 4	CH
M003	Ground hatch, ground floor, four way middle near heater	Vinyl Sheet	8 x 6	NAD - SMF
M004	Old maternity, first floor, lower layer	Vinyl Backing	12 x 5	NAD - SMF
M005	Old maternity, first floor, top layer	Vinyl Tiles	8 x 5	CH, SMF
M006	Maternity, 80-9, ground floor	Vinyl Tiles	4 x 3	CH
M007	Maternirt, 80-8, ground floor, nurses store	Vinyl Sheet	5 x 5	NAD - SMF
M008	Old maternity, bottom plant room	Gasket	4 x 2	NAD - SMF - OF

LEGEND:

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected
SMF - Synthetic Mineral Fibres Detected
OF - Organic Fibres Detected
Hand picked refers to small discrete amounts of asbestos distributed unevenly in a large body of non asbestos material.



Approved Identifier
Name: Patrick Carr



Approved Signatory
Name: Patrick Carr



Notes:

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.

The results contained within this report relate only to the sample(s) submitted for testing. WSP | PB accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. NATA does not accredit sampling. This document may not be reproduced except in full.

AUTHORISATION DATE
27/05/2016



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB1613739**

Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN LEE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD WEST END QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan.lee@douglaspartners.com.au	E-mail	: john.pickering@alsglobal.com
Telephone	: +61 32378900	Telephone	: +61 7 3552 8634
Facsimile	: +61 07 32378999	Facsimile	: +61-7-3243 7218
Project	: 72811.04 Dubbo Hospital HBM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2016DOUPAR0001 (EN/093/15)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: ALAN LEE		

Dates

Date Samples Received	: 25-May-2016 3:30 PM	Issue Date	: 25-May-2016
Client Requested Due Date	: 31-May-2016	Scheduled Reporting Date	: 31-May-2016

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 21.4°C
Receipt Detail	: ENVELOPE	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**



Sample Container(s)/Preservation Non-Compliances

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

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

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EB1613739-001 : [19-May-2016] : Window frame, George Hatch

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005P Total Metals by ICP-AES (Paint Matrices)
EB1613739-001	[19-May-2016]	Window frame, George...	✓

Proactive Holding Time Report

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

Requested Deliverables

ALAN LEE

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

DONNA PYKE

- | | | |
|-----------------------------|-------|-----------------------------------|
| - A4 - AU Tax Invoice (INV) | Email | donna.pyke@douglaspartners.com.au |
|-----------------------------|-------|-----------------------------------|

CERTIFICATE OF ANALYSIS

Work Order : **EB1613739**
Client : **DOUGLAS PARTNERS PTY LTD**
Contact : MR ALAN LEE
Address : 439 MONTAGUE ROAD
 WEST END QLD, AUSTRALIA 4101
Telephone : +61 32378900
Project : 72811.04 Dubbo Hospital HBM
Order number : ----
C-O-C number : ----
Sampler : ALAN LEE
Site : ----
Quote number : ----
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : John Pickering
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 3552 8634
Date Samples Received : 25-May-2016 15:30
Date Analysis Commenced : 30-May-2016
Issue Date : 31-May-2016 17:58



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

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

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

Analytical Results

Sub-Matrix: **PAINT**
 (Matrix: **SOIL**)

Client sample ID

				Window frame, George Hatch	----	----	----	----
				[19-May-2016]	----	----	----	----
<i>Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	EB1613739-001	-----	-----	-----	-----
				Result	---	---	---	---
EG005T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	70200	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: EB1613739	Page	: 1 of 3
Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN LEE	Contact	: John Pickering
Address	: 439 MONTAGUE ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	WEST END QLD, AUSTRALIA 4101		
Telephone	: +61 32378900	Telephone	: +61 7 3552 8634
Project	: 72811.04 Dubbo Hospital HBM	Date Samples Received	: 25-May-2016
Order number	: ----	Date Analysis Commenced	: 30-May-2016
C-O-C number	: ----	Issue Date	: 31-May-2016
Sampler	: ALAN LEE		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		



NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

- Key :
- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 - CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 - LOR = Limit of reporting
 - RPD = Relative Percentage Difference
 - # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 466160)									
EB1613739-001	Window frame, George Hatch	EG005P: Lead	7439-92-1	5	mg/kg	70200	67700	3.72	0% - 20%



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

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

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
					LCS	Low	High		
EG005T: Total Metals by ICP-AES (QCLot: 466160)									
EG005P: Lead	7439-92-1	5	mg/kg	<5	0.1 mg/kg	99.7	84	115	

Matrix Spike (MS) Report

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

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1613739	Page	: 1 of 4
Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN LEE	Telephone	: +61 7 3552 8634
Project	: 72811.04 Dubbo Hospital HBM	Date Samples Received	: 25-May-2016
Site	: ----	Issue Date	: 31-May-2016
Sampler	: ALAN LEE	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**



Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Total Metals by ICP-AES (Paint matrices)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES							
Snap Lock Bag (EG005P) Window frame, George Hatch	19-May-2016	30-May-2016	15-Nov-2016	✔	30-May-2016	15-Nov-2016	✔



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Total Metals by ICP-AES (Paint matricies)	EG005P	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES (Paint matricies)	EG005P	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals by ICP-AES (Paint matricies)	EG005P	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals by ICP-AES (Paint matricies)	EG005P	0	1	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Total Metals by ICP-AES (Paint matrices)	EG005P	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals in paint are determined following a specific acid digestion. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. ALS is not NATA accredited for this service.
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)