NSW Site Auditor Scheme
SITE AUDIT STATEMENT

Department of Environment and Conservation (NSW)

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the **Contaminated Land Management Act 1997** ***on 21 February 2005. For more information about completing this form, go to Part IV.***

PART I: Site audit identification

Site audit statement no: SA282

This site audit is a ~~statutory audit~~/**non-statutory audit*** within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details (as accredited under the *Contaminated Land Management Act 1997*)

Name: Christopher Jewell

Address: 1/13 Kalinda Road, Bullaburra, NSW 2784

Phone: 4759 3251

Fax: 4759 3257

Site details

Address: Brabham Road, Huntingwood West, NSW

Property description:

At the date of this site audit statement the site is identified as Lots 8A and 8B in DP391499, Lots AX and AY in DP374284, Lots B and C in DP371678, Lot 1 in DP171732, Lots 1 and 4 in DP976165, Lot 1 in DP916147, Lot 1 in DP915115, Lot 1 in DP802277, Lot 2 in DP244378, Lot 5 in DP913789, Lot 7 in DP913820, Lot 17 in DP666798, Lot 4A in DP378122, Lot B in DP108398, in the Parish of Rooty Hill, County of Cumberland.

A plan to consolidate the lots into one lot (Lot 1 in DP1119687) has been lodged with the Land and Property Information section of the NSW Department of Lands.

Local Government Area: Blacktown

Area of site: 56 ha ***Current zoning***: In1 General

To the best of my knowledge, the site ~~is~~/**is not*** the subject of a declaration, order, agreement or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985.*

Declaration/Order/Agreement/Notice* no(s)

.....

**** Strike out as appropriate***

Site audit commissioned by

Name: Mr Carlos Lopez

Company: APP Corporation Pty Ltd on behalf of Landcom

~~***Address:*** Level 6, 53 Berry Street, North Sydney, NSW 2060~~

Phone: 02 9957 6211

~~***Fax:*** 02 9922 4831~~

Name and phone number of contact person (if different from above)

Rinke Schoneveld, Project Manager Land Management Branch, Department of Planning

P O Box 404, Parramatta NSW 2124

Phone: 02 9895 5009

Purpose of site audit

☑ A. To determine land use suitability *(please specify intended use[s]):* Industrial and commercial use.

~~OR~~

~~☐ B(i) To determine the nature and extent of contamination, and/or~~

~~☐ B(ii) To determine the appropriateness of an investigation/remedial action/ management plan*, and/or~~

~~☐ B(iii) To determine if the land can be made suitable for a particular use or uses by implementation of a specified remedial action plan/management plan* (please specify intended use[s])~~

Information sources for site audit

Consultancy(ies) which conducted the site investigation(s) and/or remediation

Douglas Partners Pty Ltd

Title(s) of report(s) reviewed:

Validation Report, Brabham Drive, Huntingwood West, Project 40465.05, prepared by Douglas Partners Pty Ltd and dated February 2008

Report on Asbestos Management Plan, Brabham Drive, Huntingwood West, Project 40465C, prepared by Douglas Partners Pty Ltd and dated January 2008

Remediation Action Plans for Areas 1, 2, 3, 5, 6, 7, 8 and 9, West Huntingwood Project 40465C(1), prepared by Douglas Partners Pty Ltd and dated January 2008

Report on Underground Storage Tank Validation Assessment, Proposed Industrial Development Lot 1 in DP915115 Rudders Lane, West Huntingwood, Project 40465D, prepared by Douglas Partners Pty Ltd and dated 30 July 2007

Phase 2 Environmental Site Assessment, Land Capability Study West Huntingwood, Project 40465A, prepared by Douglas Partners Pty Ltd, and dated January 2008

**** Strike out as appropriate***

Sampling Analysis and Quality Plan, Proposed Development West Huntingwood Project 40465A, prepared by Douglas Partners Pty Ltd and dated April 2006

Phase 1 Environmental Site Assessment, Parcel 4 – West Huntingwood Western Sydney Parklands, Project 40465-2, prepared by Douglas Partners Pty Ltd and dated January 2006

Other information reviewed (including previous site audit reports and statements relating to the site)

- Regional geological and topographic mapping
- Regional hydrogeological data

Site audit report

Title: Brabham Drive, Huntingwood West

Report no: J1243.3R-rev0 Date: 20 February 2008

** Strike out as appropriate*

PART II: Auditor's findings

Please complete either Section A or Section B, **not** both. *(Strike out the irrelevant section.)*

Use Section A where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land use(s).

Use Section B where the audit is to determine the nature and extent of contamination and/or the appropriateness of an investigation or remedial action or management plan and/or whether the site can be made suitable for a specified land use or uses subject to the successful implementation of a remedial action or management plan.

Section A

☑ **I certify that, in my opinion, the site is SUITABLE for the following use(s)** *(tick all appropriate uses and strike out those not applicable)*:

- ~~☐ Residential, including substantial vegetable garden and poultry~~
- ~~☐ Residential, including substantial vegetable garden, excluding poultry~~
- ~~☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ~~☐ Day care centre, preschool, primary school~~
- ~~☐ Residential with minimal opportunity for soil access, including units~~
- ~~☐ Secondary school~~
- ~~☐ Park, recreational open space, playing field~~
- ☑ Commercial/industrial
- ☐ ~~Other (please specify) .....~~

subject to compliance with the following environmental management plan *(insert title, date and author of plan)* **in light of contamination remaining on the site:**

Report on Asbestos Management Plan, Brabham Drive, Huntingwood West, Project 40465C, prepared by Douglas Partners Pty Ltd and dated January 2008

~~OR~~

- ~~☐ I certify that, in my opinion, the site is NOT SUITABLE for any use due to the risk of harm from contamination.~~

Overall comments

With regard to both asbestos and chemical contamination, on any site, absolute statements that contamination is not present cannot be supported by a rational interpretation of any sampling data, recognising the inherent limitations of all such data.

On this site in particular, given its very large size and the relatively low sampling density employed (and agreed to as appropriate by the Auditor), no such definitive statement is possible. It is, however, reasonable to conclude on the basis of the sampling program carried out, and professional judgment, that overall contamination risks are likely to be low in relation to the size and value of the site.

Thus, it is appropriate to state that following a careful review, the Auditor is satisfied that the criteria he established for the site (as described in Section 2.10 of the attached site audit report) have been met, and contamination risks are acceptable.

The site is therefore considered suitable for the uses identified above subject to compliance with the management plan identified above. Any soil removed from the site should be appropriately classified in accordance with the Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Any soil imported to the site should be validated as being suitable for use on the site. Due to regional contamination and natural salinity issues and because groundwater quality may change with time, groundwater should not be extracted for any purpose without appropriate assessment.

Section B

Purpose of the plan[1] which is the subject of the audit .....

I certify that, in my opinion:

- ☐ the nature and extent of the contamination HAS/HAS NOT* been appropriately determined

AND/OR

- ☐ the investigation/remedial action plan/management plan* IS/IS NOT* appropriate for the purpose stated above

AND/OR

- ☐ the site CAN BE MADE SUITABLE for the following uses (tick all appropriate uses and strike out those not applicable):
  - ☐ Residential, including substantial vegetable garden and poultry
  - ☐ Residential, including substantial vegetable garden, excluding poultry
  - ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
  - ☐ Day care centre, preschool, primary school
  - ☐ Residential with minimal opportunity for soil access, including units
  - ☐ Secondary school
  - ☐ Park, recreational open space, playing field
  - ☐ Commercial/industrial
  - ☐ Other (please specify) .....

if the site is remediated/managed* in accordance with the following remedial action plan/management plan* (insert title, date and author of plan)

.....

.....

.....

.....

subject to compliance with the following condition(s):

.....

.....

.....

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.
Strike out as appropriate

~~Overall comments~~

PART III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority under the *Contaminated Land Management Act 1997* (Accreditation No: 9810)

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed ..... Date 21 February 2006

PART IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remedial action or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use(s) of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A or Section B of Part II, **not** both.

In **Section A** the auditor may conclude that the land is *suitable* for a specified use(s) OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further remediation or investigation of the site was needed to render the site fit for the specified use(s). Any **condition** imposed should be limited to implementation of an environmental management plan to help ensure the site remains safe for the specified use(s). The plan should be legally enforceable: for example a requirement of a notice under the *Contaminated Land Management Act 1997* (CLM Act) or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of the *Environmental Planning and Assessment Act 1979*.

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

In **Section B** the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or whether land can be made suitable for a particular land use or uses upon implementation of a remedial action or management plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

In **Part III** the auditor certifies his/her standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to:

Department of Environment and Conservation (NSW)

Contaminated Sites Section
PO Box A290, SYDNEY SOUTH NSW 1232Fax: (02) 9995 5930

AND

the **local council** for the land which is the subject of the audit

Site Audit Report

Controlled Copy ___

Site Audit

Brabham Drive
Huntingwood West NSW

for the NSW Department of Planning
February 2008

J1243.3R-rev0

C. M. Jewell & Associates Pty Ltd

Site Audit
Brabham Drive, Huntingwood West NSW
February 2008

J1243.3R-rev0

Controlled Copies 1 and 2	*Mr Rinke Schoneveld* Project Manager Land Management Branch NSW Department of Planning PO Box 404 PARRAMATTA NSW 2124
3	*Mr Warrick O'Brien* Douglas Partners Pty Ltd PO Box 486 UNANDERRA NSW 2526
4	CMJA Library

C. M. Jewell & Associates Pty Ltd
ABN: 54 056 283 295
1/13 Kalinda Road, Bullaburra, NSW 2784
PO Box 10, Wentworth Falls, NSW 2782
Phone (02) 4759 3251 Fax (02) 4759 3257
www.cm-jewell.com.au postie@cm-jewell.com.au

CHRIS JEWELL
Auditor

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

ASSOCIATED REPORTS

Validation Report, Brabham Drive, Huntingwood West, Project 40465.05, prepared by Douglas Partners Pty Ltd and dated February 2008

Report on Asbestos Management Plan, Brabham Drive, Huntingwood West, Project 40465C, prepared by Douglas Partners Pty Ltd and dated January 2008

Remediation Action Plans for Areas 1, 2, 3, 5, 6, 7, 8 and 9, West Huntingwood Project 40465C(1) prepared by Douglas Partners Pty Ltd and dated January 2008

Phase 2 Environmental Site Assessment, Land Capability Study West Huntingwood, Project 40465A, prepared by Douglas Partners Pty Ltd and dated January 2008

Report on Underground Storage Tank Validation Assessment, Proposed Industrial Development Lot 1 in DP915115 Rudders Lane, West Huntingwood, Project 40465D, prepared by Douglas Partners Pty Ltd and dated 30 July 2007

Sampling Analysis and Quality Plan, Proposed Development West Huntingwood Project 40465A, prepared by Douglas Partners Pty Ltd and dated April 2006

Phase 1 Environmental Site Assessment, Parcel 4 – West Huntingwood Western Sydney Parklands, Project 40465-2, prepared by Douglas Partners Pty Ltd and dated January 2006

QaO.31 List of Abbreviations

Measures

µg/L	micrograms per litre
km	kilometre
L	litre
m	metre
m^2	square metre
mg/kg	milligrams per kilogram
mm	millimetre

General

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	above-ground storage tank
CLM Act	Contaminated Land Management Act
CMJA	C. M. Jewell & Associates Pty Ltd
DA	development application
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DLWC	Department of Land and Water Conservation
DNR	Department of Natural Resources
DP	deposited plan
DQO	data quality objectives
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
HDPE	high-density polyethylene
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
PID	photoionisation detector
PQL	practical quantitation limit
PSH	phase-separated hydrocarbons
QA	quality assurance
QC	quality control
RAP	remediation action plan
RL	relative level
RPD	relative percentage difference
TCLP	Toxicity Characteristic Leaching Procedure
UCL	upper confidence limit
UST	underground storage tank

Analytes – Organic

BaP	benzo(a)pyrene
BTEX	benzene, toluene, ethylbenzene, xylene
OCP	organochlorine pesticides
OPP	organophosphorus pesticides
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
SVOC	semivolatile organic compounds
TPH	total petroleum hydrocarbons
VHC	volatile halogenated compounds
VOC	volatile organic compounds

Analytes – Inorganic

As	arsenic
Cd	cadmium
Cr	chromium
Cu	copper
Fe	iron
Hg	mercury
Mn	manganese

QaO.31 List of Abbreviations

Ni	nickel
Pb	lead
Zn	zinc

1.0 INTRODUCTION

1.1 Background

Site Information

This Site Audit Report relates to land located at Brabham Drive, Huntingwood West in New South Wales.

The site, which has an area of approximately 55 hectares, is bounded to the north by the Great Western Highway, to the east by Brabham Drive, to the south by the M4 Motorway, and to the west by a corridor of vacant rural land and then Eastern Creek.

At the time of the preliminary investigation in 2005, the site was used solely for horse grazing. There were six fibreboard residential buildings (some partially demolished) on the site, together with stables, sheds and septic tanks, soil stockpiles, and farming machinery. Building rubble and dumped material were scattered across the south-eastern portion of the site.

Past use of the site has been primarily residential and rural. At different times it has accommodated houses, sheds, stables, market gardening, paddocks, horse training tracks and poultry farming.

The potential sources of contamination were considered to be associated with uncontrolled dumping, fill, market gardening, and livestock farming. It was also considered that asbestos-containing materials associated with the buildings and other structures could have been present on the site.

The initial investigation of the site, instigated in 2005 by Landcom on behalf of the site owner, was conducted by Douglas Partners Pty Ltd (Douglas). The subsequent Phase 2 assessment (of the same area) confirmed the presence of asbestos contamination within surface soils. The scope of that investigation included the site that is the subject of this site audit, and three additional lots. Douglas recommended that a Remediation Action Plan (RAP) be developed, and subsequently issued a RAP for each identified area of concern.

The area of land that Douglas investigated for its Phase 1 and Phase 2 ESAs will be referred to in this report as ‘the ESA site’.

Remediation and validation were completed in September 2007.

Site Audit Purpose

A Site Audit was requested on 11 April 2006 by Mr Carlos Lopez of APP Corporation Pty Ltd on behalf of Landcom and the NSW Department of Planning. The Audit was to be conducted for the purpose of commercial due diligence prior to divestment of the site.

The Audit initially requested was a Section-B Audit, which would assess whether remediation in accordance with the RAP would render the site suitable for the proposed land use, or whether the site could be made suitable for Commercial/Industrial use, subject to the remediation of the site in accordance with Douglas’s RAPs.

On 11 October 2007, however, Mr David Burge of the NSW Department of Planning requested that a Section-A Audit be conducted instead, because the remediation was a condition of sale, and a Section-A audit would assess whether the site was suitable for the proposed development.

A Section-A audit was therefore undertaken, and is described in this report.

The Site Audit is thus a non-statutory Site Audit under the provisions of Part 4 of the Contaminated Land Management Act 1997 (the Act).

This audit was conducted for the purpose of determining the matters that are listed below (using the terminology and numbering of Section 47 of the Act):

(i) the nature and extent of any contamination of the land,

(ii) the nature and extent of the investigation or remediation, and

(iia) whether the land is suitable for any specified use or range of uses.

The Site Audit Report has been prepared in accordance with the *Guidelines for the NSW Site Auditor Scheme*, 2nd edition, 2006, issued by the NSW Department of Environment and Conservation (now Department of Environment and Climate Change (DECC)). It has been prepared by Christopher Jewell, who is a Site Auditor accredited under the NSW Contaminated Land Management Act 1997.

The Site Audit thus essentially relates to the investigation, remediation and validation work completed by Douglas and as described in the following associated reports:

- Validation Report, dated February 2008
- Remediation Action Plans, dated January 2008
- Phase 2 Environmental Site Assessment, dated January 2008
- Underground Storage Tank Validation Assessment, dated 30 July 2007
- Phase 1 Environmental Site Assessment, dated January 2006

1.2 Overview of Works Completed and Involvement of Auditor

In 2005, Douglas conducted a Phase 1 Environmental Site Assessment (ESA) to assess the ESA site's suitability for the proposed industrial/commercial land use. Douglas identified areas of low, medium and high contamination risk and made recommendations for further investigation, including sampling.

In April 2006, Douglas produced a Sampling and Analytical Quality Plan (SAQP), which outlined the works to be conducted during a Phase 2 ESA. In the Phase 2 assessment, soil sampling was conducted across the ESA site; analytical results and observations identified asbestos contamination. The investigations are further outlined in Section 3.0 of this report.

In 2007, Douglas issued the draft RAPs, which outlined the works required to render the site suitable for proposed industrial/commercial land use. The RAPs were finalised in January 2008 and are outlined in Section 4.0 of this report.

Section 4.0 also outlines remediation and validation works, which were completed in September 2007.

The Auditor became involved after completion of the Phase 1 ESA and development of a draft SAQP for the Phase 2 ESA, and reviewed both reports. The SAQP was subsequently reissued with the Auditor's requested additions. Douglas issued the Draft Phase 2 ESA in September 2006, and the Auditor's review of that report raised issues requiring clarification and/or additional information.

In May 2007, Douglas issued draft RAPs for the eight remedial areas within the site. The Auditor's review identified a number of issues requiring clarification or amendment. Douglas's written response and the final versions of the RAPs were approved by the Auditor.

In December 2007, Douglas issued the draft Validation report. The Auditor's review identified several issues that required clarification; these issues were satisfactorily addressed in Douglas's written response and the final Validation report.

The Auditor has visited the site on two occasions (at the beginning of the Audit in 2006 and prior to finalisation in February 2008) to observe and verify, as far as practicable, the site conditions and the progress of the work audited. A compliance checklist has been completed and is held on file.

Table 1 presents a summary of events and the Auditor's involvement. Copies of the correspondence referred to in the table are provided in Appendix B.

TABLE 1
Chronological Summary of Significant Events

Date	Activity/Task	Comments
2005	Douglas conducts Phase 1 ESA	Phase 1 ESA report dated January 2006.
Apr 2006	Chris Jewell commissioned as Site Auditor.	Non-statutory site audit.
Apr 2006	Douglas forwards the Phase 1 ESA and the Draft SAQP to the Auditor.	Auditor review conducted; comments and requests for clarifications forwarded to Douglas in email dated 29 April 2006.
26 Apr 2006	Initial site visit.	
Sep 2006	Douglas forwards the Phase 2 ESA to the Auditor.	Auditor review conducted; comments and requests for clarifications forwarded to Douglas in fax dated 23 Oct 2006.
5 Jun 2007	Douglas forwards to the Auditor the Draft RAPs (for eight areas of concern) and a Hazardous Building Materials survey.	Auditor review conducted; comments and requests for clarifications forwarded to Douglas in fax dated 17 July 2007.
17 Jul 2007	Letter sent by Auditor to enable progression of the contract of sale for the site.	Forwarded to Mr Graham Dickie, Landcom c/- APP Corporation Pty Limited.
Sep 2007	Remedial and validation works completed.	
11 Oct 2007	Proposal for extension of Audit to a Section-A Audit formally accepted by the Department of Planning.	
Dec 2007	Draft Validation report received by Auditor.	Auditor review conducted; comments and requests for clarifications forwarded to Douglas in fax dated 21 Dec 2007.
2 Jan 2008	UST Validation report received by Auditor.	
8 Jan 2008	Final Phase 2 ESA report and Validation report received by Auditor.	Auditor's review conducted to assess whether final reports satisfactorily addressed his comments and recommendations.
15 Jan 2008	Final RAPs and Asbestos Management Plan received by Auditor	Auditor's review conducted to assess whether final reports satisfactorily addressed his comments and recommendations.
7 Feb 2008	Final Validation Report received by Auditor.	
14 Feb 2008	Final site visit.	
19 Feb 2008	Request for clarification of Lot/DP numbers sent to Dept Planning	Clarification received in an email dated 20 Feb 2008.
20 Feb 2008	Site Audit Report (SAR) and Site Audit Statement completed by Auditor.	Copies of SAR and SAS dispatched to the Department of Planning (two copies) and Douglas.

Note: Shading indicates work undertaken before the Auditor became involved.

1.3 Scope and Structure of Review Report

Section 2 of this report sets out basic identification and location information concerning the site, and briefly describes the site's topography, drainage, layout, geology and hydrogeological setting. An indication of the site's history is also provided, and any known or potential contaminant sources listed; the associated contaminant groups of concern are also identified. A list of the individual compounds that make up the contaminant groups is provided as Appendix A. An outline of the future use of the site and the associated assessment criteria are also provided.

For a more detailed description of the site's topography, drainage, layout, drainage, geology, hydrogeology and history, reference should be made to Douglas's Phase 1 and 2 ESA reports and Validation Report.

Section 3 sets out a summary of the investigation works undertaken on the site by Douglas, and includes the Auditor's evaluation of the work and of its adherence to DEC (2006) guidelines.

Section 4 sets out summaries of the Remedial Action Plans and remediation and validation works undertaken on the site by Douglas, and includes the Auditor's evaluation of the works and of their adherence to DEC (2006) guidelines.

Section 5 of this report presents an audit of the completeness and adequacy of the investigation works that have been completed. The audit was carried out against the criteria established by the NSW DEC publication, *Guidelines for the NSW Site Auditor Scheme*, 2nd edition (2006), but also incorporates the reviewer's own judgement; reference has been made to other guideline publications issued or endorsed by the NSW EPA, including *Guidelines for Consultants Reporting on Contaminated Sites* (1997), *Guidelines for Assessing Service Station Sites* (1994), *Sampling Design Guidelines* (1995) and the *National Environment Protection (Assessment of Site Contamination) Measure* (1999), as appropriate.

Section 6 provides the Auditor's assessment of the site condition at the date of this Site Audit Report, addressing issues including the risks to human health, structures and the environment; regulatory compliance; possible contaminant migration; and long-term management.

Section 7 outlines the Site Auditor's conclusions, including his conclusion as to whether the site is suitable for the proposed industrial land use.

Throughout this report, extensive use has been made of the site assessment reports, the RAPs, and the validation report prepared by Douglas; sections of those reports have been adopted for use in this report.

Copies of communications that have ongoing relevance are attached as Appendix B; copies of information relied upon by the Auditor are included as Appendix C; Douglas's use of data quality objectives, data quality indicators, and quality assurance/quality control details are provided in Appendix D.

A copy of the Asbestos Management Plan prepared for the site by Douglas is attached as Appendix E.

Copies of the Validation Report, Asbestos Management Plan, Remediation Action Plan and the Phase 2 ESA, prepared by Douglas are provided (on CD) as Appendix F.

1.4 Limitations and Intellectual Property Matters

This report has been prepared by C. M. Jewell & Associates Pty Ltd for the use of the client identified in Section 1.1, for the specific purpose described in that section.

The work has been carried out, and this report prepared, utilising the standards of skill and care normally expected of a site auditor practising in New South Wales under the requirements of the Contaminated Land Management Act 1997. The level of confidence of the conclusions reached is governed, as in all such work, by the scope of the investigation carried out and by the availability and quality of the data. The Auditor has satisfied himself that the available data are adequate to support the conclusions he has reached, and comply with the minimum requirements indicated in the guideline documents specified for the NSW Site Auditor Scheme. Where limitations or uncertainties in conclusions are known, they are identified in this report. However, no liability can be accepted for failure to identify conditions or issues which arise in the future and which could not reasonably have been assessed or predicted using the site information and analytical data available for review.

Data collected by others have, of necessity, been used to support the conclusions of this report. Those data have been subjected to reasonable scrutiny but have essentially, and necessarily, been used in good faith. Liability cannot be accepted for errors in data collected by others where such errors could not have been detected by reasonable scrutiny of the data and supporting information supplied to or requested by the Auditor.

This report, any original data contained in the report, and its findings and conclusions remain the intellectual property of C. M. Jewell & Associates Pty Ltd. A licence to use the report for the specific purpose identified in Section 1.1 is granted to the persons identified in that section on the condition of receipt of full payment for the services involved in the preparation of the report.

It is recommended that this report should not be used by other persons or for other purposes than those identified in Section 1.1 without prior reference to the Auditor. The report must not be reproduced except in full and with the permission of C. M. Jewell & Associates Pty Ltd.

2.0 SITE INFORMATION

Basic identification and location information concerning the site is provided below. An indication of the site's topography, drainage, layout, geology and hydrogeological setting is also provided, along with an overview of the site's history.

Any known or potential contaminant sources have also been listed, and the associated contaminant groups of concern identified. An outline of the future use of the site and the associated assessment criteria are also provided.

It should be noted that some of the information presented below was obtained from Douglas's associated reports.

For a more detailed description of the site's layout, topography, drainage, geology, hydrogeology and history, reference should be made to Douglas's reports, copies of which are provided as Appendix F of this report.

2.1 Site Identification and Location

The site is located on Brabham Drive, Huntingwood West, New South Wales (as shown on Figure 1). At the date of this Site Audit Report the site comprised eighteen lots in fifteen separate DPs, all located in the Parish of Rooty Hill, County of Cumberland. It is understood that a plan to consolidate the lots into one lot (Lot 1 in DP1119687) has been lodged with the Land and Property Information section of the NSW Department of Lands.

Site Lot and DP numbers are listed below.

Lot 8A in DP391499	Lot 4 in DP976165	Lot 5 in DP913789
Lot 8B in DP391499	Lot 1 in DP915115	Lot 7 in DP913820
Lot AY in DP374284	Lot 1 in DP802277	Lot 4A in DP378122
Lot AX in DP374284	Lot 1 in DP916147	Lot B in DP108398
Lot B in DP371678	Lot 2 in DP244378	Lot 1 in DP976165
Lot C in DP371678	Lot 17 in DP666798	Lot 1 in DP171732

Australian Map Grid Zone 56H co-ordinates of the centre of the site are approximately 302372mE and 6258294mN.

The site lies within Blacktown local government area, and according to information received from the Department of Planning it is within the 'Huntingwood West Precinct' currently zoned IN1 General Industrial under State Environmental Planning Policy (Major Projects) 2005. It is roughly rectangular in shape, with an area of approximately 56 hectares.

At the date of this report, the Minister Administering the Environmental Planning and Assessment Act 1979 (currently the NSW Minister for Planning) was the registered owner of the lots comprising the site.

2.2 Site Setting

The site is located in a mixed area, bounded as outlined below.

To the north	The Great Western Highway
To the east	Brabham Road, then industrial properties
To the west	A corridor of vacant rural land with a horse-training track, then Eastern Creek and rural/residential properties
To the south	The M4 Motorway, then Eastern Creek Raceway

Rudders Lane runs through the centre of the site from north to south, but does not extend to the site's southern boundary.

To the site's north-east, on the corner of the Great Western Highway and Brabham Drive, there are the three vacant lots that Douglas included in its ESA site and an industrial property (see Figures 1 and 2).

2.3 Site Layout, Topography and Drainage

2.3.1 Site Layout

At the time of Douglas's investigations, there were fibreboard residential structures and associated outbuildings on the site. These structures and outbuildings included residences, stables, and sheds, in varying states of repair.

Douglas also observed fenced paddocks, a number of small dams, and soil stockpiles in the site's south-eastern corner.

There are medium-sized trees in some areas of the site, but most of the site is cleared of vegetation.

Figures 2 and 3 provide an indication of the site's former layout.

2.3.2 Topography

The centre of the site is approximately 50 metres above Australian Height Datum (AHD), and the site overall is relatively flat with a slight westerly slope towards Eastern Creek. The creek is approximately 40 metres above AHD.

2.3.3 Drainage

In the north-eastern site portion – on the eastern boundary – a stormwater culvert leads into a small drainage channel that runs west through part of the site, ending in a reed-filled basin. The outflow of the basin follows a northerly direction toward and under the Great Western Highway.

Surface runoff from a significant rainfall event would flow in a westerly direction toward Eastern Creek.

According to a draft flood map provided by Douglas, the site would not be subject to flood damage from a one-in-100-year flood event. It would, however, be impacted by a Probable Maximum Flood (PMF) event.

2.4 Geology

Douglas's review of the Penrith 1:100 000 Geological Series Sheet indicates that the site is underlain by Bringelly Shale of the Triassic-age Wianamatta Group, comprising shale, carbonaceous claystone, laminite and some minor coal bands. The shale bedrock is mantled locally by Quaternary alluvium within valley floors of the Eastern Creek system.

Most of the site surface is grass overlying topsoil, but some areas of fill were identified.

Douglas's investigations at the ESA site identified the generalised soil stratigraphy presented in Table 2.

TABLE 2
Soil Stratigraphy

Depth below ground level (m)	Description
0.15 – 0.5 0.2 - 1.6	Topsoil – brown silty clay, and/or Fill - (in several test pits) – including anthropogenic material
0.5 – 0.8	Clay – stiff and very stiff to extremely weathered shale
0.8 – 3.3 (max. investigation depth)	Shale – low to medium strength

Fill was encountered in ten test pits, within several lots.

2.5 Hydrogeology

The Bringelly Shale has low primary permeability and transmits water almost solely through secondary features such as joints and bedding plane fractures. Groundwater availability and vulnerability maps for the Hawkesbury–Nepean Catchment (which incorporates the site), published by the NSW Department of Land and Water Conservation, indicate that groundwater in this formation generally has low yield, high salinity and low vulnerability to pollution.

The available records indicate that yields from the Bringelly Shale are generally less than 1.5 litres per second (L/s), and that the groundwater is both saline and hard, with salinity frequently greater than 3000 milligrams per litre (mg/L) total dissolved solids (TDS).

The potential also exists for one or more perched groundwater tables to be present between the ground surface and the true water table.

Groundwater movement within the shale is likely to occur via two processes. Groundwater within both perched aquifers, at depths of generally less than 20 metres and below the true water table, would move predominantly through secondary features such as fracturing (associated with joints which are generally high angle) and features such as subhorizontal bedding-plane fractures. Some intergranular flow may occur in horizons of weathered bedrock and poorly cemented siltstone facies.

Douglas did not conduct groundwater investigations at the site, and groundwater was not encountered during the investigation test-pitting – to depths up to 3.3 metres. Douglas stated that other investigations conducted in the area had provided the following information about groundwater in the area.

- The Wianamatta Group shales have a very low intrinsic permeability, and groundwater flow is dominated by fracture flow, resulting in low yields of less than 1 L/s.
- Local groundwater is typically brackish to saline, with total dissolved solids generally in the range of 4000 to 5000 mg/L and sometimes higher. This makes the groundwater unsuitable for livestock or irrigation use.

Given the site's past land use, and given the analytical results for soil, Douglas considered that the potential for groundwater contamination from the site was low. The Auditor concurs with this assessment.

2.6 Site History

As part of its Phase 1 ESA, Douglas conducted a site history review. This included a title search, an aerial photography review, a regulatory notices search and site inspections.

The certificates of title obtained for the lots within the ESA site dated back to the late 1800s, and the aerial photographs dated from 1951. The information gained from these sources indicated that the predominant ESA site uses were agricultural and low-density residential.

Agricultural land use included market gardening and poultry farming, and also included horse-related activities such as agistment, stabling and training – which had begun in the early 1900s, and which were still taking place at the time of Douglas's assessments.

A search via the NSW EPA indicated that the site had not been subject to any regulatory notices.

The site inspections conducted for the Phase 1 ESA identified the following notable infrastructure and/or activities:

- a number of soil stockpiles, and building material and other dumped material;
- a service station adjacent to the north-eastern area of the ESA site;
- six fibreboard residential buildings and associated structures in varying states of repair;
- farm machinery and empty 1000-litre plastic tanks on concrete pavement in front of a shed;
- evidence of horse grazing and training; and
- septic tanks associated with the residential structures.

2.7 Site Contamination

On the basis of the site history and the Phase 1 ESA, Douglas identified the following potential contaminant sources:

- market gardening,
- poultry farming,
- buildings containing asbestos-containing materials,
- fill, stockpiles and uncontrolled dumping, and
- storage of fuel for farm machinery.

The Auditor concurs with this assessment.

2.8 Contaminants of Concern

Given the identified potential sources of contamination, Douglas identified the contaminant groups of concern within soils across the site as:

- heavy metals
- asbestos
- polycyclic aromatic hydrocarbons (PAH)
- monocyclic aromatic hydrocarbons – particularly benzene, toluene, ethylbenzene and xylenes (BTEX)
- organochlorine and organophosphorus pesticides
- polychlorinated biphenyls (PCB)
- total petroleum hydrocarbons (TPH)

The Auditor concurs with Douglas's identification of the contaminant groups of concern.

The individual compounds that make up these contaminant groups are listed in Appendix A.

Douglas subsequently identified asbestos as the contaminant of concern at the ESA site.

2.9 Proposed Development

It is the Auditor's understanding that the site is to be developed for commercial/light industrial land use.

2.10 Assessment Criteria – Soils

Excluding asbestos, the criteria adopted by the Auditor to assess the data contained in Douglas's reports are listed in Table 3.

For metals, PAH, OCPs and PCBs the appropriate soil investigation criteria are the guideline levels set out in Column 4 of the table: 'Soil Investigation Levels for Urban Development Sites in NSW', in the NSW DEC's *Guidelines for the NSW Site Auditor Scheme,* 2nd edition (2006).

Criteria derived from Column 4 are health-based soil investigation levels for industrial and commercial exposure settings originally developed by Imray and Langley in 1996, and currently reissued as Imray and Langley (1999): *Health-Based Soil Investigation Levels, National Environment Protection (Assessment of Site Contamination) Measure* (the NEPM), Schedule B, Guideline 7A. These soil investigation levels are also listed in Column F of Table 5-A, Schedule B(1) of the NEPM.

For TPH and BTEX, the appropriate criteria are those published in the NSW EPA's *Guidelines for Assessing Service Station Sites* (1994) and listed in its Table 3 – 'Threshold Concentrations for Sensitive Land Use – Soils'.

There are no formal criteria for asbestos in soils. Guidance is provided by the enHealth (2005) publication *Management of Asbestos in the Non-Occupational Environment*. This publication quotes from the paper by Imray and Neville (1993):

> Since buried asbestos (left undisturbed) does not present a risk to health there is no scientific basis for setting an 'acceptable' level in soil. The risk depends on the potential for disturbance and generation of airborne asbestos, which may be inhaled.

The enHealth publication states that:

> This position still holds today. Quantification down to trace levels of asbestos is not necessary for decision making in the majority of situations.

However, enHealth also quotes Imray and Neville (1993) and a number of other sources as suggesting that a site could appropriately be classified as uncontaminated or unrestricted and suitable for all uses if the level of asbestos in the soil was less than 0.001 per cent (10 mg/kg); enHealth itself makes no firm recommendations in this respect.

The NSW EPA previously advised site auditors that (in relation to residential and primary school sites) 'no asbestos in soil at the surface is permitted'. However, that advice is not included in the current edition of the NSW DEC's *Guidelines for the NSW Site Auditor Scheme*, 2nd edition (2006).

Depending on sample condition, the quoted level of 0.001% is at or below the laboratory quantitation limit for individual samples, and in the Auditor's opinion it is not realistic to attempt to quantify asbestos fibre content to this level on a site basis (as opposed to an individual sample basis).

The Auditor's position is that, following an adequate standard of investigation (something that is judgemental and site-specific), neither asbestos fibres nor asbestos-containing materials should be found in surface and near-surface soils (or such contamination, if present, should be removed), and asbestos at depth should be controlled by a management plan that is appropriate to the proposed site use.

TABLE 3 Assessment Criteria – Soils (mg/kg)		
Analyte	***DEC Column 4**** **(NEPM Column F)** **Commercial/Industrial**	**Sensitive Land Use – Soils**[†]
Metals and Metalloids		
Arsenic (total)	500	-
Cadmium	100	-
Chromium (III)	600,000	-
Chromium (VI)	500	
Copper	5000	-
Lead	1500	-
Mercury (inorganic)	75	-
Nickel	3000	-
Zinc	35,000	-
Organics		
Aldrin + Dieldrin	50	-
Chlordane	250	-
DDT + DDD + DDE	1000	-
Heptachlor	50	-
PAHs (total)	100	-
Benzo(a)pyrene	5	-
PCBs (total)	50	-
Petroleum Hydrocarbon Components		
TPH C_6-C_9	-	65
TPH C_{10}-C_{40}	-	1000
Monocyclic Aromatic Hydrocarbons		
Benzene	-	1
Toluene	-	130[§]
Ethylbenzene	-	50[¶]
Total xylenes	-	25[¶]

Notes:

[†] and notes below: NSW EPA (1994)

[§] Human health and ecologically based protection level for toluene. The threshold concentration presented here is the Netherlands intervention value for the protection of terrestrial organisms. Other considerations such as odours and the protection of groundwater may require a lower remediation criterion.

[¶] Human health based protection level for ethylbenzene or total xylenes as shown. The threshold concentration presented here is the Netherlands intervention value. Other considerations such as odours and the protection of groundwater may require a lower remediation criterion.

3.0 SITE INVESTIGATIONS

3.1 Douglas – Phase 1 Environmental Site Assessment, 2006

3.1.1 Objectives and Scope

Douglas stated on page 1 of its Phase 1 ESA report that the objective was 'to conduct a preliminary desktop study to determine the potential for contamination resulting from past and present site uses'.

The scope of the Phase 1 ESA included three lots not owned by the Department of Planning: Lot 99 in DP1030393 and Lots 4 and 5 in DP327540. These lots were located beyond the north-eastern boundary of the site that is the subject of this site audit.

The scope of work (page 2) included:

- a site inspection;
- a site history review, regulatory notice, land titles, aerial photographs, and interviews with local residents; and
- identification of Areas of Environmental Concern (AECs) and assessment of the need for further investigations.

3.1.2 Identification of AECs

For each lot within the ESA site, Douglas categorised the risk of contamination as low, medium or high, on the basis of its site history review and site inspections.

Table 4 shows the AEC risk category assigned to each lot, excluding the three lots that are not part of the site that is the subject of this site audit.

TABLE 4
AEC Risk Categories
(Douglas, 2006)

Low risk	Medium risk	High risk
Lot 5 in DP913789	Lot AY in DP374284	Lot 1 in DP802277
Lot 8A in DP391499	Lot AX in DP374284	Lot 7 in DP913820
Lot 8B in DP391499	Lot 4 in DP976165	
Lot 2 in DP244378	Lot 1 in DP915115	
Lot 1 in DP171732	Lot 1 in DP916147	
	Lot B in DP371678	
	Lot C in DP371678	
	Lot 17 in DP666798	
	Lot 4A in DP378122	
	Lot B in DP108398	
	Lot 1 in DP976165	

Douglas then made further recommendations regarding the investigation strategy for each category, describing the sampling strategy and density, and selecting an analytical suite for soil samples.

3.1.3 Douglas's Conclusions and Recommendations

In order to further detail the Phase 2 ESA requirements, Douglas recommended that a Sample Analysis and Quality Plan (SAQP) be developed, and concluded that – should the Phase 2 ESA detect contamination – a RAP would have to be produced before any remedial works began.

3.1.4 Auditor's Evaluation of Phase 1 ESA

Shortly after being commissioned, the Auditor reviewed Douglas's Phase 1 ESA, together with the draft SAQP.

He considered the investigation adequate to inform both the SAQP and subsequently the Phase 2 investigation.

The Auditor's review and recommendations relating to the SAQP and the Phase 2 ESA are discussed in Section 3.2.5 of this report.

3.2 Douglas – Phase 2 Environmental Site Assessment, 2006

3.2.1 Objectives and Scope

On page 2 of the Phase 2 ESA report, Douglas stated that the aims of the investigation were to:

- Conduct a detailed investigation of the degree and extent of the potential soil contaminants within the site; and
- To investigate each lot according to the sampling regime recommended in the Phase 1 ESA [and SAQP] and to make comment as to their related suitability for the proposed land use.

The Phase 2 ESA report did not outline a scope of works, but it did outline sampling strategies for the three risk categories.

- ***Low Risk:*** Sampling on a grid basis, at the rate of four test-pit locations per hectare, and at regular depth intervals.

  For 50 per cent of the samples, the full analytical suite (Suite 2) was used (with the exception of asbestos) – including all the contaminants of concern listed in Section 2.8.

  The other 50 per cent were analysed for heavy metals and OCP/OPP (Suite 1).

- ***Medium Risk:*** Sampling on a judgmental basis, at the rate of six to eight test locations per hectare and at regular depth intervals.

  The analytical suite was selected on the basis of the perceived contamination potential. As a result, 50 per cent of samples were analysed for the contaminants of potential concern as listed in Section 2.8 (Suite 3), and 50 per cent were analysed for Suite 2.

- ***High Risk:*** Sampling at the density recommended by the EPA for an area of this size, with judgmental sampling in areas of environmental concern at regular depth intervals.

  The medium-risk analytical suite was also selected for the high-risk areas.

The SAQP detailed the sampling to be conducted, and specified locations for each area/Lot within the ESA site.

The scope of the Phase 2 ESA, like that of the Phase 1, included the three lots not owned by the Department of Planning: Lot 99 in DP1030393 and Lots 4 and 5 in DP327540. These lots were located beyond the north-eastern boundary of the site that is the subject of this site audit. The Auditor was assured that APP received appropriate permission from the owner in this regard.

3.2.2 Results

Analytical results for soil sampling are summarised below.

Metals

In the 350 samples analysed, all metals concentrations were within the adopted criteria (listed in Table 3 above).

TPH and BTEX

In the 309 samples analysed, all TPH and BTEX concentrations were within the adopted criteria (and most were below laboratory reporting limits).

PAH

In the 263 samples analysed, all PAH concentrations were within the adopted criteria.

PCB

In the 312 samples analysed, all PCB concentrations were below laboratory reporting limits.

OCP/OPP

In the 348 samples analysed, all OCP concentrations were within the adopted criteria. Concentrations of OPP compounds were detected in sample 15 from Lot 17 in DP666798 and in sample 21 from Lot 4A in DP378122. There are no current guideline levels for OPPs, but the detected concentrations were low – either equal to the laboratory detection limit or marginally above.

Douglas's statistical analysis of the data sets for each area indicated that the 95% upper confidence limits were well within the appropriate criteria. The statistical analyses, together with the summary of laboratory results, are provided in Appendix C1.

The sample locations are shown on Figure 4.

Asbestos

Asbestos was identified (visually and also via laboratory testing) in nine areas/lots – at ground level and in topsoil and fill. These locations are shown on Figure 5. One of these areas (Area 4) was subsequently excised from the site, because although it was within the site that Douglas investigated, it was one of the three lots (Lot 4 in DP32754) not owned by the Department of Planning.

3.2.3 Douglas's Conclusions and Recommendations

Douglas stated on pages 16 and 17 of its report that although the results of the investigation showed that no concentrations exceeded the adopted health investigation guidelines for organic or inorganic contaminants, the identified asbestos contamination required remediation and the development of a RAP.

Douglas concluded that remediation of the asbestos contamination would render the ESA site suitable for the proposed land use.

Douglas also recommended that an asbestos management plan be developed, to address the management of any asbestos that might be uncovered during site development works.

3.2.4 Auditor's Evaluation of Adherence to DEC Guidelines

Data Quality Objectives (DQOs)

Douglas appropriately adopted the data quality objectives (DQO) process endorsed by DEC (2006).

A detailed DQO checklist has been completed, a copy of which is included as Appendix D of this Site Audit Report.

Data Quality Indicators (DQIs)

Data quality indicators were not specifically used to assess field procedures and analytical results. However, much of the required information was provided elsewhere in the report or within the QA/QC assessment, or was otherwise confirmed by the Auditor.

QA/QC Evaluation

The field and laboratory QA/QC measures presented have been reviewed and are considered to comply with DEC guidelines and to be adequate to ensure the integrity of the data set used to assess the site. Specifically, a detailed QA/QC checklist was completed and a copy is provided in Appendix D.

The QA/QC criteria list examined in this review included:

- Precision
- Accuracy
- Sensitivity
- Representativeness
- Comparability
- Completeness
- Holding times
- Blanks

In summary:

1. Douglas adopted and described an appropriate sampling plan, appropriate sample handling, and appropriate sample collection and transport processes.
2. The sampling procedures adopted by Douglas, as outlined in the assessment report, are considered to substantially comply with DECC guidelines and to be adequate to ensure the integrity of the data set used to assess contamination on this site. The following issues were, however, noted regarding field QC sampling.
    - Inter laboratory duplicates were not collected/analysed.
    - Wash blank analyses detected low concentrations of lead in three samples. Douglas attributed these results to 'impurity in the distilled water, ingress of dust during collection or a small interference from the sampling tools' (Phase 2 ESA, 2008, p.11). The Auditor considers this interpretation acceptable. The first explanation is likely if commercial distilled water was used.
    - Trip blank analyses detected low concentrations of three metals. This was attributed, by Douglas and the laboratory, to natural levels of metals in the sand used, an interpretation that the Auditor considers acceptable.

    Given the number of wash and trip blanks collected/prepared over the course of the investigation, and given that the vast majority were contaminant free, the Auditor does not consider that the above results affect the integrity of the data.
3. Intra laboratory duplicates were collected at frequencies that met DEC guidelines, with outlier relative percentage differences (RPDs) attributed to low concentrations and heterogeneity.
4. Trip spikes were either collected at frequencies that met DEC guidelines, or not required.
5. The NATA-accredited laboratory identified methods used, and provided satisfactory reporting limits. QA/QC procedures comprised method blanks, matrix spikes, laboratory control samples, duplicates and surrogates. The review confirmed that method blanks were free of contamination, and either that spike recoveries, duplicate RPDs and surrogate recoveries were within control limits or that an acceptable explanation was provided.

The Auditor considers that the overall quality of data and their presentation are of an adequate standard to support the conclusions he has reached.

3.2.5 Auditor's Evaluation of Phase 2 ESA

The Auditor reviewed the Draft SAQP for the Phase 2 ESA, made comments and recommendations, and provided advice in subsequent correspondence.

His primary concern related to sampling density. He noted that the sampling density proposed for and conducted at the ESA site for the low-risk and medium-risk areas did not comply with EPA guidelines.

Because previous land use and site inspections suggested that the risk of contamination was low, the Auditor considered that the sampling density proposed was acceptable for the low-risk areas; he requested, however, that the density be increased for the medium-risk areas.

Additionally, the Auditor asked Douglas to provide a strategy for minimising Type ii (false negative) errors where the sampling density does not meet EPA guidelines, and to assess the acceptable level of uncertainty for these areas. Douglas amended the SAQP accordingly.

After the SAQP had been finalised, Douglas proposed an alternative strategy for the analysis of depth samples. Douglas argued that any existing contaminants would be present in the surface/shallow samples, and that therefore it would be necessary to analyse a deeper sample only if contamination had been detected in the surface sample. The Auditor accepted this argument for samples of natural soils, but not for fill samples.

The Auditor reviewed the Draft Phase 2 ESA report and found it to be acceptable and generally in accordance with the SAQP.

The Auditor concluded that Douglas's investigation was sufficiently in accordance with relevant guidelines (apart from the sampling density exception noted and agreed to) and with his own recommendations and advice.

He therefore agrees with Douglas's conclusion that asbestos was the only contaminant of concern at the ESA site that required remediation in order to render the ESA site suitable for the proposed (or any) land use.

4.0 REMEDIATION AND VALIDATION

4.1 Douglas – Remedial Action Plans, 2007

The works and guidelines outlined in each of Douglas's eight RAPs – for Areas 1, 2, 3, 5, 6, 7, 8 and 9 – were almost identical for each area, varying only in the dimensions of each excavation.

The location of each area within the site is shown on Figure 5.

Douglas did not produce a RAP for Area 4 because, although it had been investigated during the Phase 2 ESA, it was subsequently deemed not to be part of the site that is the subject of this audit.

4.1.1 Objectives and Scope

The objectives of the remediation program stated on page 4 of each RAP were to:

- Remove from the subject site all asbestos contaminated filling material placed on the site;
- Backfill the resultant excavation with Virgin Excavated Natural Material; and
- Ensure that the remaining materials form a suitable substrate for the proposed redevelopment.

The remediation scope for each area (2007, p. 5) comprised:

- exploratory test-pitting/strip-trenching along the boundary of each remedial area to delineate the extent of asbestos-containing material;
- estimation of the volume of material to be removed;
- in-situ sample collection for waste classification purposes;
- excavation of asbestos-containing material by an appropriately licensed asbestos contractor;
- air monitoring during excavation;
- transport of excavated material to a licensed asbestos disposal depot;
- visual and sample analysis validation of excavations;
- preparation of a clearance certificate by a qualified occupational hygienist; and
- excavation backfilling with validated virgin excavated natural material (VENM).

4.1.2 Validation Plan

Following the excavation of each area, and as appropriate for asbestos, validation was to involve a combination of visual and sample analysis.

The sampling rate for the excavations was to be:

- one sample per 10-metre grid on the base, at least one per base,
- one sample per 10 linear metres of wall, or at least one per wall, *or*
- four wall samples if the excavation is a round shape.

All samples were to be analysed for asbestos and any other contaminants identified or suspected during works.

Should visual observation or sample analysis identify asbestos (or any another contaminant), further excavation would be conducted, followed by re-validation, until both visual observation and sample analysis confirmed that the area was free of contamination.

The validation plan outlined appropriate sample collection and handling, field and laboratory QA/QC requirements, and validation reporting requirements.

4.1.3 Auditor's Evaluation of RAPs

The Auditor reviewed the eight RAPs, and in July 2007 requested some clarifications and made recommendations. The related correspondence is provided in Appendix B.

The remedial works and final RAPs appropriately adopted these recommendations.

4.1.4 Hazardous Building Material Assessment

Douglas's assessment (report issued in April 2007) identified several instances of asbestos-containing material in buildings on the site.

This assessment report did not require the Auditor's review or endorsement.

After completion of Douglas's Phase 2 ESA, and before remedial works began, all buildings were demolished, and the dumped material and stockpiles were removed.

4.2 Douglas – Remediation and Validation, 2007

4.2.1 Remedial and Validation Works

Works were conducted in accordance with the RAPs, and an additional three areas were remediated and validated – making a total of eleven. The asbestos contamination identified at the additional three areas was considered to have resulted from the demolition works.

The material in all targeted remedial areas was initially scraped back to depths varying between 100 and 300 millimetres. Validation samples, which were composites, were subjected to laboratory analysis, and results showed that samples from areas 1, 3, 6, 7, 8 and 9 contained asbestos. Additional excavations were conducted in these areas, and further sampling conducted, until each area had been validated. All final remedial excavations extended to natural clay.

Fragments of asbestos cement were observed within the driveway area between Area 5 and Rudders Lane, and at the locations of two demolished houses – Northern House and Southern House, both near the site's south-eastern corner. These three additional areas were remediated and validated in accordance with the strategies presented in the RAPs.

Locations of all remedial areas are shown on Figure 5.

Asbestos piping encountered in Areas 2 and 5 was removed. Douglas stated that these sections of pipes had been associated with the former residential buildings and were not in use or connected to any remaining infrastructure.

A total of 146 composite samples were collected and analysed for asbestos.

4.2.2 Underground Storage and Septic Tanks

Underground Storage Tank

Douglas's Report on Underground Storage Tank Validation Assessment, dated 30 July 2007, outlined the removal and validation of an underground storage tank (UST).

During the Hazardous Building Materials Survey, a fuel fill point had been identified within Lot 1 in DP915115 (south of remedial area 6), indicating that a UST was located in the area. Its presence was confirmed after nearby buildings had been demolished. A petrol pump, with no associated piping, was removed from the top of the UST.

The 4500-litre UST contained a mixture of water and hydrocarbon fuel, which was removed by an appropriately licensed water contractor before excavation of the tank began.

The UST was observed to be in good condition, with no sign of rust or damage. Five validation samples were obtained from the walls and base of the tank pit, and analytical results for all five samples showed that contaminant concentrations were either below laboratory reporting limits or well within the appropriate criteria.

The surrounding fill material was excavated to natural soils and stockpiled. Analytical results for the two samples collected from the 26-cubic-metre (m^3) stockpile indicated that the material was suitable for site re-use, but the UST pit was not reinstated during works.

Septic Tanks

A number of septic tanks associated with the residential buildings were identified during investigation of the site. These were not removed during demolition works. Because they were solely for domestic use, Douglas considered that they did not pose a potential contamination risk – but it recommended their removal during site redevelopment works nevertheless, for aesthetic reasons.

The Auditor's assessment of the contamination potential of the remnant septic tanks is discussed in Section 6.0 below.

4.2.3 Waste Classification and Disposal

Samples for waste classification purposes were collected before excavation works began. Two samples from each of the eight areas were laboratory analysed for the appropriate range of contaminants. Analytical data indicated that concentrations of chemical contaminants were low; because asbestos was present, however, the 2300 tonnes of material was classified as solid waste and transported off site to a solid waste disposal facility.

The summary of laboratory results is provided as Appendix C2; waste disposal dockets were provided to the Auditor.

4.2.4 Asbestos Clearance Certificate

A validation report prepared by Airsafe – Occupational Health Consultants (Airsafe) was provided as an appendix to Douglas's Validation report. The Airsafe report outlined the air monitoring, visual inspection and soil sampling conducted, and provided a clearance certificate for the eleven remediated and validated areas.

The asbestos clearance certificate is provided as Appendix C3.

4.2.5 Douglas's Conclusions

Douglas concluded that the areas remediated have been rendered suitable for the proposed land use, and recommended that the Asbestos Management Plan be implemented should additional asbestos contamination be detected during development (2007, p. 26).

4.2.6 Auditor's Evaluation of Adherence to DEC Guidelines

Data Quality Objectives (DQOs)

Douglas appropriately adopted the data quality objectives (DQO) process endorsed by DEC (2006).

A detailed DQO checklist has been completed, a copy of which is included as Appendix D of this Site Audit Report.

Data Quality Indicators (DQIs)

Data quality indicators were not specifically used to assess field procedures and analytical results. However, much of the required information was provided elsewhere in the report or within the QA/QC assessment, or was otherwise confirmed by the Auditor.

QA/QC Evaluation

The field and laboratory QA/QC measures presented have been reviewed and are considered to comply with DEC guidelines and to be adequate to ensure the integrity of the data set used to assess the site. Specifically, a detailed QA/QC checklist was completed and a copy is provided in Appendix D.

The QA/QC criteria list examined in this review included:

- Precision
- Accuracy
- Sensitivity
- Representativeness
- Comparability
- Completeness
- Holding times
- Blanks

In summary:

1. Douglas (and Airsafe) adopted and described an appropriate sampling plan, appropriate sample handling, and appropriate sample collection and transport processes.
2. The sampling procedures adopted by Douglas, as outlined in the assessment report, are considered to substantially comply with DEC guidelines and to be adequate to ensure the integrity of the data set used to assess contamination on this site. The following issues were, however, noted regarding field QC sampling (these related to the waste classification sampling only).
    - Inter laboratory duplicates were not collected.
    - Wash and trip blanks were not collected/prepared.

    The Auditor notes that field QC sampling was not conducted strictly in accordance with DEC guidelines. He considers, however, that the omissions noted above are not significant, and do not impact on the integrity of the data set.
3. Intra laboratory duplicates were collected at frequencies that met DEC guidelines, with outlier RPDs attributed to low concentrations and heterogeneity.
4. Trip spikes either were collected at frequencies that met DEC guidelines, or were not required.
5. The NATA-accredited laboratory identified methods used, and provided satisfactory reporting limits. QA/QC procedures comprised method blanks, matrix spikes, laboratory control samples, duplicates and surrogates. The review confirmed that method blanks were free of contamination, and either that spike recoveries, duplicate RPDs and surrogate recoveries were within control limits or that an acceptable explanation was provided.

The Auditor considers that the overall quality of data and their presentation are of an adequate standard to support the conclusions he has reached.

4.2.7 Auditor's Evaluation of Remediation and Validation

The Auditor reviewed the Draft Validation report, and sought clarification and additional discussion from Douglas on some issues. The Auditor's specific questions and comments, and Douglas's response are provided in Appendix B.

The issues were clarified to the Auditor's satisfaction, both in the fax and in the final validation report.

From the description of the works in Douglas's reports and related correspondence, the Auditor is satisfied that the site has been appropriately investigated in accordance with DEC guidelines, and that the identified asbestos contamination has been appropriately remediated, validated and transported off site for disposal. The clearance certificate issued by Airsafe confirms that the eleven remediated areas are free of asbestos in surface soils.

Although the asbestos contamination was largely associated with structures at the site, remnant asbestos may still be present at the site, given that asbestos was removed from both fill and topsoil, and given the site's considerable size. The Auditor therefore endorses the need for, and the implementation of, the Asbestos Management Plan (AMP) during site development.

The AMP developed by Douglas is outlined and discussed below.

4.3 Asbestos Management Plan

Douglas produced the draft Asbestos Management Plan (AMP) in July 2007 as a guide to the management of any asbestos discovered during development of the site.

In summary, the report recommended the following approach upon the discovery of material potentially containing asbestos.

1. Notify the Principal's representative, stop work and remove any workers from the immediate area.
2. Secure and signpost the area with a warning tape, bollards or fencing.
3. Prohibit access to all personnel unless they are wearing personal protective equipment (PPE).
4. Get an experienced environmental consultant to sample the potential asbestos-containing material.

Douglas recommended that:

- any excavation works undertaken during redevelopment be conducted or supervised by personnel who have experience in identifying and/or working with asbestos;
- all contractors conducting intrusive works at the site be made aware of the AMP; and
- should sample analysis detect asbestos, the area be remediated in accordance with relevant legislation and guidelines, and validated.

Douglas identified the relevant Acts and Codes of Practices and described the recommended PPE.

The Auditor provided some suggestions for the AMP, which Douglas incorporated into the final report.

The Auditor considers that the final AMP is a suitable guideline document for the management of any asbestos identified on site during redevelopment works.

5.0 AUDITOR'S ASSESSMENT OF THE ADEQUACY OF THE CONSULTANT'S WORK AND REPORTING STANDARDS

The Auditor has assessed the adequacy of Douglas's work and the ESA reports and the RAPs.

The following information was provided and considered to be adequate for the purposes of this audit:

- site location and description of site
- review of site history, including potentially contaminating activities
- outline of actual or potential contamination
- identification of potential contaminants of concern
- description of soil stratigraphy and hydrogeology
- investigation works
- quality assurance and quality control plan
- discussion of analytical results
- discussion of environmental quality criteria
- assessment of risks to human health
- assessment of aesthetic issues
- remediation and validation works
- recommendations for short-term management of potential residual contamination
- recommendations and conclusions

The following information was not provided, but was not considered relevant by the Auditor, given the results of the investigation:

- discussion of groundwater issues
- recommendations for long-term management of residual contamination
- assessment of chemical mixtures
- discussion of evidence of migration of contaminants

Overall the standard of reporting presented within Douglas's report is considered satisfactory and to comply with the NSW EPA's *Guidelines for Consultants Reporting on Contaminated Sites* (1997) and the NSW DEC's *Guidelines for the NSW Site Auditor Scheme*, 2nd edition (2006).

The Auditor considers that there has been compliance with requirements imposed by the planning consent authority.

6.0 AUDITOR'S ASSESSMENT OF SITE CONDITION

6.1 Risks to Human Health

After a detailed review of all the information available to him, the Auditor has concluded that in respect of the major issue of concern on this site, asbestos contamination of soils, the Auditor's criteria (as set out in Section 2.10) have been met.

In respect of other potential contaminants, the adopted DECC-endorsed criteria have been met.

The Auditor therefore considers that there are no identifiable contamination risks to human health remaining at the site. However, as there may still be remnant asbestos-containing material at the site, the Auditor endorses the need for and implementation of Douglas's Asbestos Management Plan during redevelopment works.

Although groundwater in the area is not of potable quality, groundwater at the site presents no identifiable risk to human health.

6.2 Risk to Structures

The assessment of site soils and groundwater indicated that there are no identifiable contamination risks to structures at the site. As indicated in Section 5.3, saline groundwater is a regional issue, and appropriate advice should therefore be sought regarding potential impacts on structures that may extend to groundwater.

6.3 Risk to the Environment

The assessment of site soils and groundwater indicated that there are no identifiable contamination risks to the environment at the site.

Although septic tanks remain in the site subsurface, nutrients associated with these tanks do not typically mobilise, and are susceptible to natural attenuation. Moreover, Bringelly Shale and the associated clays have low primary permeability, and transmit water almost entirely through secondary features such as joints and bedding plane fractures.

The Auditor therefore considers that nutrients associated with the septic tanks should not pose a risk to groundwater or surface water resources.

6.4 Regulatory Compliance

SEPP 55 Remediation Category

The Auditor sought confirmation from both Douglas and the site owner that the remediation category (as defined under SEPP 55) had been identified and that the conditions applicable to that category had been complied with.

Douglas stated that it considered the remedial works to be Remediation Category 2, and also stated that it had not given notice of the proposed work to Council. Under SEPP 55, if works are deemed Category 2 notice must be given at least 30 days before work commences.

The site owner (the Minister for Planning) was unable to provide confirmation that the necessary notice had been given to Council.

The Auditor notes that the site is subject to Sydney Regional Environmental Plan No. 20 - Hawkesbury–Nepean River (No. 2 - 1997), which states (in Part 3, 11 - 'Development Controls', point 4) that remediation of contaminated land requires consent. The remediation to be carried out at this site is therefore defined as Remediation Category 1 under SEPP 55, and consequently development consent must be sought from the consent authority.

WorkCover

Additionally, a WorkCover permit must be obtained before asbestos remediation work begins. Douglas's report stated that this permit was obtained by the contractor, AJV Services.

6.5 Potential Contaminant Migration

On the basis of the analytical data presented by Douglas, the Auditor does not consider that the potential for off-site migration of contamination originating from the site is an issue of concern.

As discussed above, the potential for migration of nutrients from the remnant septic tanks is considered to be low.

6.6 Groundwater Issues

On the basis of the assessment results and the analytical data for site soils presented by Douglas, the Auditor considers that groundwater contamination issues are not of concern on this site.

As discussed above, the potential for leaching of nutrients from the remnant septic tanks to the groundwater is considered to be low.

6.7 Aesthetic Issues and Odours

The Auditor considers that the only potential aesthetic or odour issue relates to the remnant septic tanks. Although the proposed land use is known to be commercial/industrial, the specific development type is unknown. For example, it is not known whether there will be subsurface excavations, or whether the site will be entirely paved.

Should there be excavation works during redevelopment, these issues may arise, and removal of the tanks may prove necessary. Alternatively, however, redevelopment works may involve paving the site – and this would eliminate any such issues.

6.8 Chemical Mixtures

On the basis of the analytical data presented by Douglas, the Auditor considers that the potential for chemical mixtures to be present is not an issue of concern on this site.

6.9 Short-Term and Long-Term Management

The site does not require any form of long-term management. The short-term management required is that outlined within Douglas's AMP (for implementation during redevelopment works), which is provided as Appendix E.

7.0 AUDITOR'S CONCLUSIONS AND RECOMMENDATIONS

7.1 Adequacy of Investigation, Remediation and Validation

The Auditor considers that, except as noted in this report, investigation, remediation and validation were carried out in an adequate and appropriate manner, and in accordance with appropriate guidelines.

With regard to both asbestos and chemical contamination, on any site, absolute statements that contamination is not present cannot be supported by a rational interpretation of any sampling data, recognising the inherent limitations of all such data.

On this site in particular, given its very large size and the relatively low sampling density employed (and agreed to as appropriate by the Auditor), no such definitive statement is possible. It is, however, reasonable to conclude on the basis of the sampling program carried out, and professional judgment, that overall contamination risks are likely to be low in relation to the size and value of the site.

Thus, it is appropriate to state that following a careful review, the Auditor is satisfied that the criteria he established for the site (as described in Section 2.10) have been met, and contamination risks are acceptable.

7.2 Suitability of Site for Proposed Use

The Auditor considers that the site has been assessed to the required standard, and that identified contamination has been addressed. Specifically, the areas of identified asbestos contamination have been appropriately remediated and validated, and any asbestos remaining on the site can be appropriately managed subject to the implementation of the specified AMP.

On the basis set out in Section 7.1, the Auditor has concluded that it is appropriate to issue a Site Audit Statement which indicates that the site is suitable for commercial or industrial use.

Because undetected asbestos may remain within site soils, and for due diligence purposes, the Auditor makes the following recommendations.

- Douglas's AMP should be implemented if potential asbestos-containing material is identified during site works.
- Any soil that is removed from the site should be appropriately classified in accordance with the guidelines issued by the NSW EPA in its *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (1999).
- Any soil imported to the site should be validated as suitable for use on the site.
- Groundwater should not be extracted for any purpose without appropriate assessment.

REFERENCES

ANZECC 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. National Water Quality Management Strategy, Australian and New Zealand Environment and Conservation Council/Agriculture and Resource Management Council of Australia and New Zealand.

ANZECC 1992, *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council.

enHealth 2005, *Management of Asbestos in the Non-Occupational Environment*, Australian Department of Health and Ageing, Canberra.

Imray, Paula and A. Langley 2000, *Health-Based Soil Investigation Levels, National Environment Protection (Assessment of Site Contamination) Measure, Schedule B, Guideline 7A.*

Imray, Paula and G. Neville 1993, Approaches to the Assessment and Management of Asbestos-Contaminated Soil' in A. Langley and M. Van Alplen, *The Health Risk Assessment and Management of Contaminated Sites*, Contaminated Sites Monograph No. 2.

NSW DEC 2006, *Guidelines for the NSW Site Auditor Scheme*, 2nd edition, NSW Department of Environment and Conservation, Sydney NSW.

NSW EPA 1999, *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*, NSW Environment Protection Authority, Chatswood NSW.

NSW EPA 1997, *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Environment Protection Authority, Chatswood NSW.

NSW EPA 1995, *Sampling Design Guidelines*, NSW Environment Protection Authority, Chatswood NSW.

NSW EPA 1994, *Guidelines for Assessing Service Station Sites*, NSW Environment Protection Authority, Chatswood NSW.

Important Information About Your Site Audit Report

These notes will help you to interpret your Site Audit report. They are based on guidelines prepared by the NSW Department of Environment and Conservation.

Introduction to the NSW Site Auditor Scheme

Objectives

The objectives of the NSW Site Auditor Scheme are to:

- ensure that public health and the environment are protected through proper management of contaminated sites, particularly during changes of land use
- improve access to technical advice on contaminated sites for planning authorities and the community by establishing a pool of accredited site auditors
- provide greater certainty for planning authorities and the community through the independent review by those auditors of contaminated site assessment and remediation reports, and reports that validate the successful completion of the assessment of remediation.

Background

In Australia, the use of accredited auditors to review work conducted by contaminated site consultants was first introduced in Victoria in 1989 through the Victorian EPA's Environmental Auditor (Contaminated Land) Scheme.

In 1998, NSW commenced its own Site Auditor Scheme under the *Contaminated Land Management Act 1997* (CLM Act). The scheme is administered by the Department of Environment and Conservation (DEC).

The CLM Act empowers DEC to accredit individuals as site auditors and to establish guidelines for them.

The Contaminated Land Management Regulation 1998 (CLM Regulation) specifies some of the procedural requirements of the scheme.

Site Audits in Relation to Contaminated Sites

Site auditors review the work of contaminated site consultants. The CLM Act calls these reviews 'site audits' and defines a site audit as an independent review:

a) that relates to investigation or remediation carried out (whether under the CLM Act or otherwise) in respect of the actual or possible contamination of land, and

b) that is conducted for the purpose of determining any one or more of the following matters:

   i) the nature and extent of any contamination of the land

   ii) the nature and extent of the investigation or remediation

   iii) whether the land is suitable for any specified use or range of uses

   iv) what investigation or remediation remains necessary before land is suitable for any specified use or range of uses

   v) the suitability and appropriateness of a plan of remediation, a long-term management plan, a voluntary investigation proposal or a remediation proposal.

The main products of a site audit are a 'site audit statement' and a 'site audit report'.

A **site audit statement** is the written opinion by a site auditor, on a DEC-approved form, of the essential findings of a site audit. It includes, where relevant, the auditor's conclusions regarding the suitability of the site for its current or proposed use.

Before issuing a site audit statement, the site auditor must prepare and finalise a detailed **site audit report**. The report must be clearly expressed and presented and contain the information, discussion and rationale that support the conclusions in the site audit statement.

In some circumstances a site audit is required by law. These audits are known as '**statutory site audits**' and may be carried out only by site auditors accredited under the CLM Act. A statutory site audit is one that is required by:

- a regulatory instrument issued under the CLM Act, including DEC agreements issued by DEC to voluntary proposals.
- the *Environmental Planning and Assessment Act 1979*, including an environmental planning instrument or development consent condition
- any other Act.

Role of Site Auditors

The services of a site auditor can be used by anyone who needs an independent and authoritative review of information relating to possible or actual contamination of a site. The review may involve independent expert technical advice or 'sign-off' of contaminated site assessment, remediation or

validation work conducted by a contaminated site consultant.

Site Assessment and Audit Process

The usual stages in the assessment, remediation and validation of a contaminated site, and in the audit of those activities, are as follows:

Consultant is Commissioned to Assess Contamination

In most cases, a site owner or developer engages a contaminated site consultant to assess a site for contamination and, where required, to develop a remediation plan, implement the plan and validate the remediation.

The contaminated site consultant designs and undertakes the site assessment and, where required, all remediation and validation activities to achieve the objectives specified by the owner or developer.

Site Auditor Reviews the Consultant's Work

The site owner or developer commissions the site auditor to review the consultant's work. The auditor prepares a site audit report and a site audit statement at the conclusion of the review, which are given to the owner or developer.

Where the local planning authority or DEC uses its legal powers to require the carrying out of a site audit, the site owner or developer must commission a site auditor accredited under the CLM Act to perform this task. This is known as a 'statutory' audit. The CLM Act requires that an auditor must notify DEC when he or she has been commissioned by anyone other than DEC to perform a statutory site audit. The auditor is also required to furnish the local authority and DEC with a copy of the completed site audit statement.

In some cases, the site owner or developer may wish to have a site audit undertaken although it is not a legal requirement. The audit is termed 'non-statutory'. If their intention is to obtain a site audit statement, they must commission a site auditor accredited under the CLM Act to perform this task. This is because only a site auditor so accredited can issue a site audit statement and they are obliged to issue one at the end of any site audit. For non-statutory audits, the site auditor must give a copy of the site audit report to the local authority or DEC, or both, on request.

As required by the CLM Act, DEC maintains a record of all statutory site audit statements issued in relation to land that is the subject of a regulatory instrument under the CLM Act. Copies are available for public inspection through DEC's website at www.environment.nsw.gov.au. If the local council receives a copy of a site audit statement, it must list the statement on any certificate it issues under section 149 of the *Environmental Planning and Assessment Act 1979* in relation to the land concerned.

Limitations of Your Site Audit Report

The following notes have been added by the Auditor who prepared this report, to highlight some important limitations on the use of this report.

This report has been prepared by C. M. Jewell & Associates Pty Ltd for the use of the client who commissioned it, and relevant government agencies, for the specific purpose described in the report.

Consistently with the objectives of the NSW Site Auditor Scheme, it may be appropriate for others to rely upon this report in some circumstances.

However, the original purpose of this report and the site conditions prevailing at the time the report was prepared – as described in the report – should be considered first.

If you are not the person for whom the report was prepared, or you wish to use it for a different purpose to that for which it was prepared, or site conditions appear to differ from those described in this report, or a significant period of time has elapsed since the report was prepared, then PLEASE CONSULT THE SITE AUDITOR BEFORE RELYING UPON THE REPORT.

It is also important to recognise that a site audit is primarily a review of work carried out by other companies and individuals.

The site auditor has checked data and interpretations, ascertained whether or not appropriate guidelines have been followed, and satisfied himself that the available data are adequate to support the conclusions he has reached.

However, all environmental sampling programs have an inherent degree of uncertainty. Even when sampling fully complies with guidelines, it is possible for areas of contamination to remain undetected, but be revealed by more extensive excavations during site redevelopment. This risk is usually quantified using statistical confidence limits.

The site audit report identifies data limitations and uncertainties where these are recognised, but users must accept the finite and unavoidable risk that some contamination may remain undetected during even a diligent site assessment and audit process.

If there is a need to copy this report, it must be reproduced in full. No reliance whatsoever should be placed upon partial copies of a site audit report.