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Prepared for:

Taranaki Regional Council

47 Cloten Road, Private Bag 713
Stratford, New Zealand

Patea Freezing Works, New Zealand Review of Interim Asbestos Hazard Control Measures Following Fire

ENSR Australia Pty Ltd (HLA ENSR)

20 February 2008

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Distribution

Patea Freezing Works, New Zealand
Review of Interim Asbestos Hazard Control Measures Following Fire

18 February 2008

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Workgroup Manager OHS&E

Editorial Peer Reviewer: **Date:** 20/2/2008

for.

John Lodder
Principal HSE Consulting Specialist

Technical Peer Reviewer: **Date:** 20/2/08

Ross McFarland
Principal Contaminated Sites, Auditor, National Practice Leader

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Appendices

1.0 Site Visit

Ian Field of ENSR Australia Pty Ltd (HLA ENSR) visited the Patea site on 14 February 2008 following a meeting with Mr Gary Bedford of Taranaki Regional Council (TRC). Gary Bedford was aware that Ian Field was in New Plymouth where he is currently engaged by Contact Energy Ltd to provide consultant advice with regard to the removal of asbestos from the Boiler House and Turbine Hall of the Power Station. Gary Bedford informed us that the Patea site had been substantially destroyed by a major fire that started on Waitangi Day, 06 February, 2008. Further information is available at: http://www.stuff.co.nz/videoplayer/122244a25281.html.

The issue that TRC asked us to comment on was how effective and achievable their plan was to secure the site from further asbestos hazards until site clearance and demolition could occur. This report addresses our understanding of actions taken from when the fire was detected until our site visit of 14 February 2008. We do not purport to provide TRC and or other parties with an enduring and prescriptive management plan to address the long term site future.

Mike Nager of TRC drove Ian Field to the site where we were accompanied by two staff from the Taranaki District Health Board. Mike Nager and Ian Field wore disposable overalls and P2 respiratory protection. The Taranaki District Health staff were issued P2 respiratory protection. Two local Iwi were near the site entrance but our limited site time did not allow Ian Field any discussion with them.

Fire damage is widespread with much but not all of the site destroyed. Considerable corrugated asbestos cement sheeting debris is evident in two areas in particular. These approximate areas are marked up on 1964 site plan provided to us. There is an area of approximately 10,000 m² between the Boiler House and the remaining partially damaged buildings to the east of the site that formerly comprised the Freezer and Storage Building and abattoir Building. The other significant area is the site of the former Office and Workshop north of the concrete reservoir pit. The existing Storage shed northeast of the reservoir has sustained significant fire damage to its southern end and asbestos cement sheeting debris is spread over a ground area up to 10 metres from the damaged section of the building.

The Boiler House appears structurally damaged and it was considered unsafe for anything other than a cursory inspection. Only a small section of pipe lagging (less than one lineal metre) and two small pressure vessels on top of the two boilers, have an appearance of containing friable asbestos lagging. Importantly, main steam lines, where accessible, all appeared to be insulated with synthetic mineral fibre.

2.0 Discussion

We consider the actions taken to date on site have been appropriate and timely. Our understanding of actions carried out after the fire was started includes the following:

- Air monitoring was carried out at three locations to determine airborne asbestos fibre concentrations. The method of analysis was the widely recognised *Membrane Filter Method for Estimating Airborne Asbestos Fibres.* The laboratory conducting the tests, Capital Environmental Services (2005) Ltd (CES), holds an appropriate NZ accreditation for the tests(See: https://secure.ianz.govt.nz/scripts/IANZWebSearch/IANZWebSearch.exe/displaycoy?coy_no=6054). The three air sample tests were below the lowest level of detection for the method and are considered satisfactory.
- Capital Environmental Services conducting swab testing and analysis for asbestos fibre from 20 properties at Patea. The testing was carried out by CES staff on the 07 February 2008. All samples were reported as 'No asbestos detected'. The method of analysis is in accordance with industry standard.
- The site is being kept wet by irrigation from the river. This is important as asbestos fibre presents risk when it is airborne and of a size considered inhalable. Put simply, wet asbestos fibre will be classifiable as a hazardous material but risk is seen as negligible because the pathway to harm is not available.
- Residents were invited by TRC to make their houses available for a water wash down.

We understand that a specialist contractor(s) will spray apply a propriety dust stabilizing solution, Binder AW95, to the major fire damaged location described in this report as having an approximate footprint of 10,000 m². This area has significant asbestos cement sheet debris evident and we understand the contractor has a capacity to apply the stabilizing product by water jetting techniques that will not require the area to be physically walked over. We have no history of the application or suitability of AW95. We have read the Materials Safety Data Sheet (MSDS) and note the product is non-toxic water borne acrylic polymer. It will break down over time such that site remediation should probably occur within 12 months.

There is no safe access (in our opinion) to the Boiler House. The contractor can, however, spray apply the stabilising product inside the Boiler House by hose reel applications from a safe platform. This means access for the operator is to work from outside the western door entrance and from the higher southern windows. These windows can be accessed by a scissor lift, mobile scaffold or other approved safe work platform. We urge that a liberal spray application be directed to the superheaters on top of each boiler.

The other and smaller main area of asbestos cement debris is to be scraped into the existing intact reservoir pit. If it is not considered practical to apply the stabilising solution to this smaller area prior to its disturbance, the work must be done under continuous wet irrigation. The asbestos cement sheeting debris should be thoroughly wet ahead of the actual temporary clean up measures. The stabilising solution can be applied to cap surfaces of the stockpiled debris once the mechanical work is completed.

3.0 Recommendations

- Carry out further air monitoring for airborne asbestos fibres around the site boundary. This should occur prior to the dust stabilising product being applied. We envisage CES or other New Zealand laboratory accredited for such testing, may require up to 10 sample pumps. We suggest a run time of 8 hours is preferable to the recommended minimum 4 hour sample period.

- Air monitoring should be repeated during the dust stabilization process and during the mechanical clean up of the smaller stockpile of debris. Air sampling pumps should be placed at the barrier tape that defines the work zone for each major location.

- Insist that the contractor applying the stabilizing product has an appropriate level of respiratory and eye protection. We note that there is a reference to ammonia odour in the MSDS. The contractor should carry out a risk assessment prior to commencing his work. This means having the appropriate eyewash on hand and an emergency shower facility, such as access to a low pressure wash from the irrigator.

- Carry out monthly monitoring at the site boundary until site remediation commences or until directed by a qualified consultant to review the frequency of 'background' air monitoring.

- Consider, if inspection indicates that it is necessary, using an appropriate licensed asbestos removal contractor to bag fragments of asbestos cement sheet debris that have fallen outside of the stabilization zone. Most asbestos cement debris is 10 or less metres from the footprint of where the former buildings stood.

- Maintain a soil trench system in areas where potential run off could carry free asbestos fibre to areas that would otherwise not be contaminated.

- Organise a structural engineer's report for the whole of site.

- In the longer term, develop a site remediation strategy. This could be on site or off site burial of the asbestos-containing materials. Burial is the currently recognised method of disposal for asbestos waste and contamination. As such, it is not fanciful to consider such action could occur on this site. Burial could be aboveground, capped and bunded in view of the suspected high water table. Appropriate site-specific regulatory guidance for the remediation should be obtained. The site remediation program is likely to incorporate the removal of remaining asbestos cement cladding along with other identified hazardous materials.

- Maintain site security for safety reasons site is remediation is certified satisfactory and complete.

We are available to discuss any aspects of this report and look forward to being of service to you in the future.

Appendices

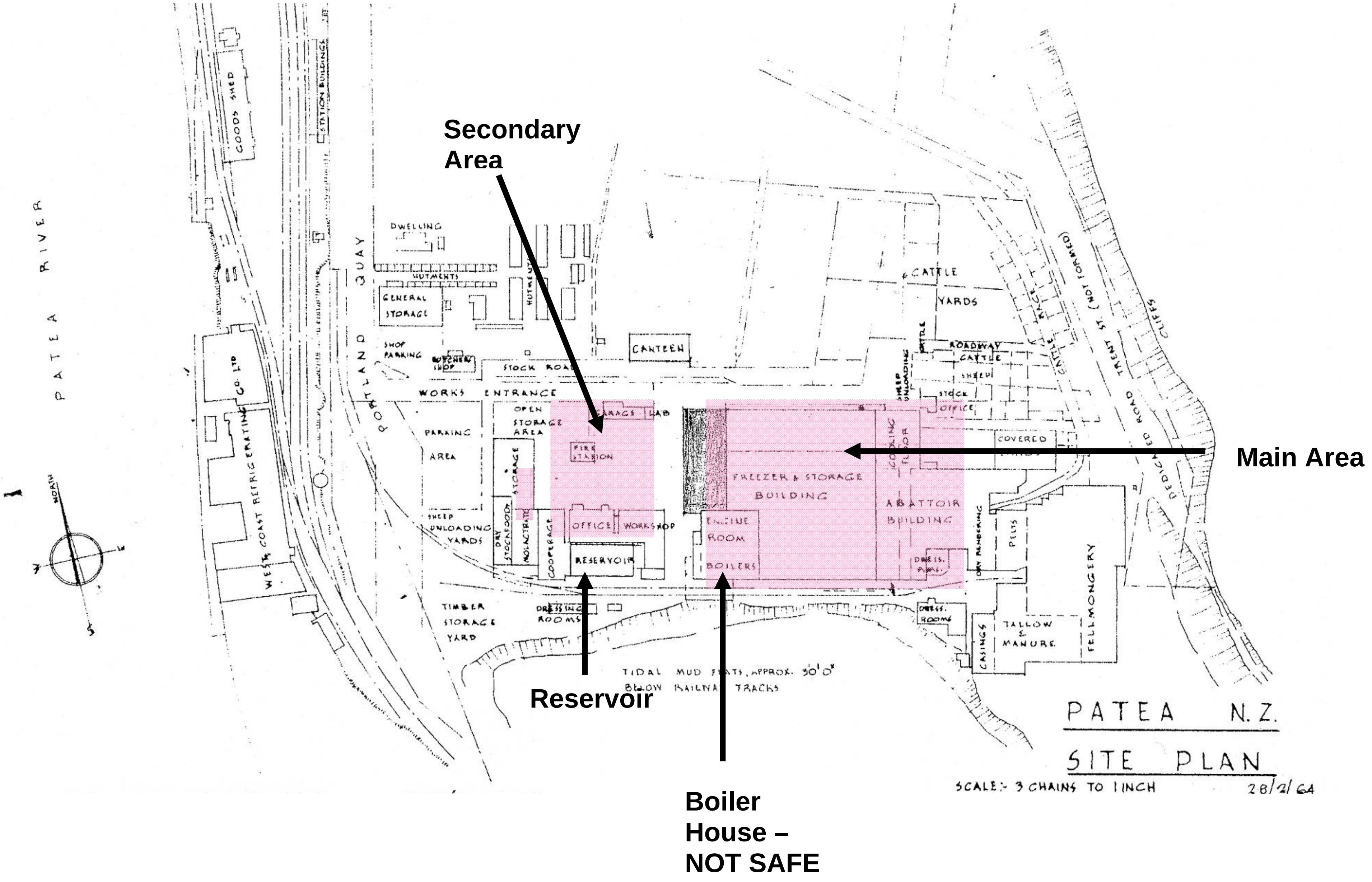
Patea 1964 Site Map with two main fire damaged localities marked up

CV, Ian Field

CV, Ross McFarland

Appendix A

Patea 1964 site map with two main fire damaged localities marked up


Secondary Area
Main Area
Reservoir
Boiler House – NOT SAFE
PATEA RIVER
GOODS SHED
STATION BUILDINGS
QUAY
PORTLAND QUAY
DWELLING
HUTMENTS
GENERAL STORAGE
SHOP PARKING
BUTCHERY SHOP
STOCK ROAD
CANTEEN
WORKS ENTRANCE
PARKING AREA
OPEN STORAGE AREA
GARAGE
LAB
FIRE STATION
STORAGE
SHEEP UNLOADING YARDS
DRY STOCKFOODS
COOPERAGE
OFFICE
WORKSHOP
RESERVOIR
ENGINE ROOM
BOILERS
FREEZER & STORAGE BUILDING
COOLING FLOOR
ABATTOIR BUILDING
CATTLE YARDS
ROADWAY
CATTLE SHED
STOCK OFFICE
COVERED
PELTS
FELLMONGERY
TALLOW & MANURE
CASINGS
TIMBER STORAGE YARD
DRESSING ROOMS
TIDAL MUD FLATS, APPROX. 30'0" BELOW RAILWAY TRACKS
TRENT ST. (NOT FORMED)
CLIFFS
WEST COAST REFRIGERATING CO. LTD
NORTH
PATEA N.Z.
SITE PLAN
SCALE:- 3 CHAINS TO 1 INCH
28/2/64

Appendix B

Curriculum Vitae – Ian Field and Ross McFarland

Ian Field
Workgroup Manager-OHS&E

Expertise

- Asbestos risk management consultancy
- Asbestos audit and survey for public and private sector
- Asbestos removal project management
- Seminars to management, staff, employees and unions, with respect to asbestos and workplace hazards
- Tender and specification to AS 2124
- Quality assurance and control, notably for the Woodside offshore modules and for the submarine base at Garden Island, WA
- Failure analysis

Career Profile

Ian joined HLA in 2005 after a career that began more than two decades earlier in Western Australia. Ian joined a team of scientists in the acquisition of an industrial consulting laboratory that looked at issues such as design and installation of cathodic protection systems for the Dampier- Perth natural gas line; the evaluation and failure testing of protective coatings for the Woodside offshore modules; the investigation of anti-fouling failure in RAN submarines; and the development of silica-based coatings to mitigate the risk of asbestos fibre release from weathered and deteriorated roofs. From this genesis came a long association with 'matters asbestos'. Ian took a leading role in the establishment of NATA accredited laboratories in Western Australia to tackle the considerable issue that asbestos is in that state. The legacy of the Wittenoom blue asbestos mine meant that there was a heightened awareness in WA of asbestos issues.

After developing a sustainable and efficient asbestos and OHS consultancy business in Perth, Ian moved to Melbourne in 1989 with a specific goal to provide quality asbestos consultancy to the petrochemical industry. The WA experience with BP's Kwinana refinery had revealed the vast usage of asbestos lagging in the industry. By 1992, Ian had established solid relationships within the petrochemical industry and his laboratories were receiving over 500 samples a week for asbestos analysis. The Victorian business continued to grow through the decade leading up to 2000 and a sound and diverse client base was established. In particular, there were quality relationships built with the Department of Housing and Construction, with leading private and public hospital personnel and with large industrial manufacturers such as Orica's initiating explosives arm, IES.

Ian spent several years providing consultancy and services in the asbestos industry. He was able to provide authoritative audit and project management services to the construction and demolition sectors. In 2002, the site remediation of a major disused gasification plant was a project that the State Government of Victoria was keen to commence. Ian spent several years as the asbestos and hazardous materials consultant prior to the successful completion of the project. Ian then joined HLA where his role is to provide quality asbestos services to public and private sector clients. His goal is to enhance the quality and quantity of advice that is provided by HLA nationally with respect to asbestos consultancy services.

Key Industry Sectors

- Commercial Property - due diligence
- Industrial - Audit and project management
- Manufacturing – Audit and consultancy
- Defence – Audit, consultancy and project management

Membership and Qualifications

- Fellow of the Australian Institute of Company Directors (Rtd).
- National Association of Testing Authorities (NATA) Signatory, Asbestos.
- NATA Assessor for Chemical Testing, Asbestos, throughout Australia and New Zealand.

Ian Field
Workgroup Manager-OHS&E

Representative Experience

Asbestos and Hazardous Materials Audit; Asbestos Risk Management Consultancy; Project Management

Ian has over twenty years experience in carrying out audits, producing reports and hands on management of many projects. Ian's skills in this area and his ability as a project manager add an enhanced level of professionalism to any project he is involved in.

Prior to joining HLA Ian was engaged as a principal consultant to the State Government for the remediation of the Morwell Brown Coal Gasification Project. This $14M project was completed in 2006. Ian's role involved the pre tender award consultation with the client and regulatory agencies as well assisting the client with assessment of the tender. Once the project was underway Ian was the on site project manager for two years. His duties involved the investigation of asbestos as per Part 6 (pre-demolition) audit under the current Victorian Occupational Health and Safety (Asbestos) Regulations; synthetic mineral fibre (SMF); lead based paint; polychlorinated Biphenyls (PCBs); and ozone depleting substances.

Ian was responsible for the preparation of detailed reports with a dedicated hazardous materials register as well as the Scope of Work for hazardous materials removal. This was on behalf of the client and incorporated as a Tender Schedule.

In order to ensure the smooth running of the project, Ian initiated and managed weekly site meetings with the client, superintendent and contractor. Finally Ian signed off on above ground asbestos and hazardous materials removal to the EPA appointed land auditor for that phase of site remediation.

Other hazardous asbestos materials audits have been carried out over the last 20 years for clients including:

- VicTrack Access- asbestos and hazmat audit for regional and Melbourne facilities (2005,2006)
- Clifton Cooney PL- asbestos and hazmat audit of CBD commercial properties at pre-refurbishment stage (2005-2006)
- Buxton Developments PL-asbestos and hazmat audit as part of due diligence for CBD commercial property (2005)
- Alex Fraser Demolitions- asbestos removal supervision and clearance, SPT site in Footscray as part of site remediation (2005)
- Thinc Projects PL- asbestos and hazmat audit on behalf of Department of Defence for various projects associated with the Rationalization of DSTO Facilities, Fishermans Bend, Vic. (2005-2006)
- Canteri Bros. Constructions Vic. PL- asbestos and hazmat audit for the upgrade of shops, Queen Victoria Market (2006)
- Thiess Services on behalf of Melbourne Water- asbestos and hazmat audit at various Victorian pumping facilities as a precursor to their demolition or upgrade (2005-2006)
- Case Meallin PL on behalf of Woolworths Australia- asbestos and hazmat for the proposed partial demolition of former Ropeworks factory, Geelong. The site is under heritage listing and HLA provided specific and concise recommendations for preservation of designated areas within the site and have developed an asbestos risk management plan (2005-2006)
- Guilfoyle Wreckers PL- asbestos and hazmat audit at numerous sites prior to their demolition works. We normally provide project management and certificate of clearance following specialist asbestos removal (2005-2006)
- Caltex Australia Petroleum PL- asbestos audit, seminars and training to contractors, assistance with development of asbestos management plan (2005-2006)
- Treasury and Finance (Vic), Major Projects-asbestos and hazmat audit and subsequent project management for Morwell brown coal greenfields remediation (2003-2005)

- Coffey Geosciences PL-authoritative reports and final sign off to their EPA auditor following two years on site project management for the Morwell project. The summary of 6000 air monitoring tests and interpretation of several hundred soil sample analyses formed part of the final report. (2006)
- Environmental & Earth Sciences PL- provided interpretation of data and strategic

Asbestos and Hazardous Materials Audit; Asbestos Risk Management Consultancy; Project Management

- SGS Environmental Services PL- direction and management of staff for major project in Gippsland (2003-2005)
- Burns Bridge Australia PL-asbestos audit, preparation of Tender to AS 2124, project management for various projects including Victoria Barracks upgrade and asbestos removal and demolition at Peter McCallum Cancer Institute (1990 -1998)
- Smorgon Reinforcing PL- various project management jobs at Sunshine site (2004)
- Kraft Foods Australia PL- project management and letter of clearance for multiple asbestos removal projects. Discussions and seminars with staff and OHS groups (2000-2004)
- Construction Engineering PL- asbestos and hazmat audit of numerous facilities including the refurbishment of Big W in Morwell and the significant upgrade of White Horse Plaza (2000-2004)
- Ministry of Housing and Construction- audits of houses, schools and facilities throughout Victoria. Provision of risk models prepared by this author that are now substantially adopted by the Government (1990-1998)

Tender and Specification to AS 2124

The preparation of documentation to this standard requires a methodical and meticulous approach. Ian's experience in Tender preparation has enhanced the existing capacity that the Firm enjoys.

Ian has provided technical specification to AS 2124 for project and clients including:

- Asbestos removal from Peter McCallum Cancer Institute
- Preston and Northcote Community Hospital (PANCH)
- Warrnambool Base Hospital
- Britax Child-Care Products
- Grain Elevators Board
- Centro Properties

Publications

Company Director, October 1992. Environmental Management Feature- “Asbestos in The Workplace.” This was a review of legislative, statutory and practical obligations applicable to employers throughout Victoria

Ross McFarland
Principal, Contaminated Sites, Practice Director, Former Gasworks Assessment and Remediation
Accredited Site Auditor (NSWEPA No. 9819), HLA National Practice Leader Contaminated Land Management
Expert Witness and Court's Expert

Expertise

- Site Auditing
- Gasworks, Asbestos, PAHs
- Expert Witness – Contaminated Land
- Regulatory Compliance Specialist
- Risk Assessment
- Industrial/Hazardous Waste Management
- Solid/Liquid Waste Treatment Technologies applications
- Environmental Auditing/Due Diligence
- TechSupport in Legal Cases & Commissions of Inquiry
- Community Consultation/Communications/Mediation

Career Profile

Ross McFarland is a registered site auditor with more than 25 years local, national and international experience in environmental management, with the last decade or more focused on risk-based contaminated sites assessment and remediation. Ross has fulfilled various roles ranging from office management to specialist technologist, and has been responsible for a wide range of environmental chemistry and management projects including work in Hong Kong and Europe for government and private sector clients.

Ross has been directly responsible for the regulatory management of numerous contaminated sites being remediated across New South Wales between 1992 and 1994. This included control and compliance assessment for the hazardous wastes contained and/or generated in those contaminated sites.

Ross has been integral in developing environmental guidelines for the NSWEPA for the management of contaminated sites, including guidelines for Consultant Reporting and guidelines for Field Quality Assurance. Between 1990 to 1994 Ross was employed by the NSWEPA to develop regulatory management techniques for contaminated land in NSW. During this time he also was NSW representative to the first and second national workshops for the risk assessment and management of contaminated land, subsequently published by the South Australian Health Commission. The information from these workshops is currently being incorporated into the revision of the ANZECC National Guidelines, now due for release by Year 2006. The last three years in the NSWEPA were as Manager of the newly formed Contaminated Sites Section, a group of more than a dozen multi-skilled

professionals.

In 1989 Ross was co-opted onto the National Health & Medical Research Councils Working Group to work with four others in the development of what became the 1992 ANZECC/NHMRC National Guidelines for the Assessment and Management of contaminated Sites. This document is considered the industry standard for contaminated land management in Australia and New Zealand.

Ross is the Australian representative to a number of international journals in environmental management and has been appointed to the Advisory Board of the Centre for Ecotoxicology at the NSWEPA/University of Technology Sydney joint facility in Sydney.

Ross is also the consultant industry representative to the National Environment Protection Measure (NEPM) for the assessment of contaminated lands. The NEPM has become the nationally agreed framework for all contaminated sites assessment work.

Ross is guest lecturer to the University of New South Wales, University of Technology Sydney and Macquarie University in contaminated site assessment, remediation, environmental management, project management and asset maximisation.

This combined experience in government and consulting, along with a thorough understanding of the technical issues, including community consultation and communication risk assessment, and regulatory compliance, as well as a strong national and international contact base, makes Ross a valuable resource on the HLA team.

Key Industry Sectors

- Defence
- Government
- Legal
- Construction
- Property
- Manufacturing
- Transport

Qualifications

- Master of Engineering (Research – Waste Management), University of NSW, 1988
- Bachelor of Applied Science (Chemistry), Canberra College of Advance Education, 1980
  JP (NSW) No. 107154

Awards

- Honorary Research Fellow of the Australian Centre for Environmental Management 1992
- Miles Burkett Fellowship, 1989
- University of New South Wales Engineering Faculty Dean's Fellowship, 1985

Memberships

- Foundation President, Australian Contaminated Land Consultants' Association (1996-1998)
- Editorial Board, International Journal of Waste Management & Research, Denmark

- Editorial Board, International Journal of Land Contamination & Reclamation, UK
- Member of Hazardous Substances Committee, Australian Water & Wastewater Association
- Advisory Board Member, Centre for Ecotoxicology, University of Technology, Sydney
- Advisory Board, Centre for Environmental Risk Assessment and Remediation, University of South Australia
- Policy Advisory Board, Australian CRC for Risk Assessment and Remediation (CARE)

Representative Experience

Relevant Asbestos in Soil Experience

Ross has been involved in the assessment and management of asbestos-impacted sites for more than a decade. Example projects include:

- Department of Defence, Navy Supply Centre, Randwick as accredited site auditor involved in the independent review of asbestos assessment and remediation undertaken by Defence to enable a former Navy Supply Centre to be redeveloped for low-density residential purposes.
- Landcom, Zetland. Landcom (NSW Agency associated with development of State owned land), as environmental consultant involved in the development of assessment, remediation and contingency planning for former Defence site in the inner Sydney suburb of Zetland, NSW. This work included the development of an "Unexpected Findings Protocol (UFP) that was designed to address residual asbestos in soil risks that may arise during the Site's subsequent civil earthworks development program.
- Former Prince Henry Hospital, Little Bay, NSW. Poorly managed historical demolition and waste management/filling activities during the 1950's and 1960 had resulted in uncontrolled disposal and dispersal of asbestos containing materials across the former Prince Henry Hospital Site. During the 1980's the Site was earmarked as surplus to NSW government's needs and it was passed to Landcom for redevelopment and sale. Novel and targeted assessment and remediation protocols were developed to address the asbestos issue and allow the Site's staged redevelopment for low density residential and open space purposes.
- Kooindah Resort Development for Investa Pty Ltd. The development site, near Wyong in NSW, was in a very poor quality, with uncontrolled swampland reclamation and a paint waste dump. During the Site's remediation and redevelopment, the earthworks contractor accidentally mixed crushed asbestos pipe

into otherwise inert fill that was being used as part of the Site's flood management program. An innovative process to identify and address this crushed asbestos pipework that was dispersed across portions of the redevelopment was required. The asbestos in soil problem was comprehensively addressed in a timely manner to enable the Site's signoff and redevelopment for low-density residential and golf course uses.

- Tallawarra Power Station Auditor signoff. A former power station site near Wollongong NSW, was demolished in the 1970's and left idle for many years. Recent moves to redevelop the Site for a new fast-start, peak low gas-fired power station necessitated the assessment and remediation of the Site for this industrial purpose. As Site Auditor for this project, Ross McFarland worked closely with Andrew Russell (HLA's OH&S Asbestos Expert) to ensure that the Site was appropriately assessed and remediated to enable it to be signed off for the new power station's construction. Remediation using vacuum trucks was one of the innovative approaches applied to this site to enable its subsequent redevelopment.
- Hunter Hospital Roadway Corridor (NSW). During the road works construction of a new entry Newcastle's Hunter Hospital, asbestos impacted uncontrolled fill was encountered that led to the immediate cessation of the construction activities. HLA's Ross McFarland and Andrew Russell were called in to address this problem and allow the road works, which were creating a daily traffic congestion problem, to recommence as soon as possible, but only after the asbestos risks had been satisfactorily addressed.

In addition to project-specific work, Ross has been involved in the development of current best practice for the assessment and management of asbestos in soil, including:

- Second National Workshop on the Health Risk Assessment and Management of Contaminated Sites (1993), and specifically assisting in work by Paula Imray and Andrew Langley in the development of the published paper titled: Approaches to the Assessment and Management of Asbestos – contaminated Soil (pages 247 – 259 of Proceedings).
- Australian Contaminated Land Consultants' Association Inc (2000) - development of the NSW ACLCA Code of Practice for Assessment and Management of Asbestos in Soil, and its subsequent revisions.
- Asbestos Round Table Workshop (November 2001) eventually leading to the 2005 enHealth Guidelines for the Management of Asbestos in the non-occupational

Settings.

Ross has also presented Australian practice in relation to asbestos in soil management, including chairing a workshop on asbestos in soil management at the Consoil 2000 International Conference in Gentt, Belgium in 2000.

Gasworks experience

Specific manufactured gas plant experience in Australia and internationally including the following sites:

Mortlake, NSW	Broken Hill, NSW	Little Manly Point, NSW
Waverton, NSW	Macdonaldtown, NSW	Muswellbrook, NSW
Kirribilli, NSW	Camden, NSW	Mittagong, NSW
Newcastle (Steel St), NSW	Millers Point, NSW	Auckland, New Zealand
Mudgee, NSW	Abbotsford, NSW	Tokyo, Japan
Tamworth, NSW	Newport, NSW	Singapore
Katoomba, NSW	Geelong West, VIC	Liverpool, NSW
Newstead, QLD	Ipswich, QLD	Wollongong, NSW

NSW Department of Environment and Conservation (formerly NSWEPA) – Gasworks Sites Identification and Prioritisation. NSW DEC awarded Ross McFarland (due to his considerable gasworks knowledge) a contract to identify the current and past gasworks sites in NSW, and prioritize the list in terms of the need for further investigation or remedial response. Using international best practice prioritisation techniques (primarily modeled on Gas de France protocols) the list of more than 50 sites was prioritized for DEC's further consideration. A number of previously unknown but suspected gasworks were identified and classed as "phantom sites", for further investigation. DEC used this information for reporting to the Environmental Trust in terms of the environmental significance of these types of sites.

Abbotsford former gasworks, NSW – due to poor early record keeping, a former gasworks site that was not remediated was inadvertently built over with more than a dozen homes affect4ed by possible contamination. Working closely with AGL as the EPA's independent site auditor, the sites were assessed and remediated to a level that allowed the residential landuses to continue. The Site was complicated by the current residential developments, including swimming pools over the former annulus structure, and residual contamination identified within footings. The site remediation and signoff was closely monitored by EPA to ensure appropriate compliance and auditing issues were fully addressed.

AGL Mortlake – a $66 million 55 hectare remediation being completed over five years, that is transforming a former gasworks site into residential and commercial uses.

Development of Environmental Guidelines

In 1989, Ross and a number of others joined together to commence the establishment of National Guidelines for the assessment and management of contaminated sites. After more than three years, this work resulted in the publication of the Australian & New Zealand Guidelines for the Assessment & Management of Contaminated Sites (Jan 1992), published jointly by the Australian & New Zealand Environment and Conservation Council and the National Health & Medical Research Council (ANZECC/NMHRC). This document has been formally adopted across Australia as the minimum standard for contaminated sites management. It stresses the critical role that early community involvement plays in site clean-ups.

Since the publication of this document, further developments have been progressed through the proceedings of the bi-annual public sector conferences on the health risk assessment and management of contaminated sites, generally known as the South Australian Proceedings. Ross was one of the major early contributors to these proceedings that have now become the basis of the National Environmental Health Forum (NEHF)

monographs. Ross is currently involved in developing national policy and assisting in NSW state policy development for the assessment and management of asbestos-in-soil.

Regulatory Compliance Auditing
Ross has direct experience in satisfying the regulatory requirements for directions under contaminated land Notices, applications for pollution control approvals and related planning instruments through Local and State governments. This work includes a complete understanding of the current regulatory requirements for site assessment and remediation, having been responsible for the publication of all current contaminated sites environmental guidelines arising for the NSWEPA.

Site Auditing
Ross has provided expertise in contaminated land auditing in at more than a dozen sites in the last year, including former landfills, military sites, gasworks, food manufacturing sites, petrol stations, chemical works and a wide range of other potentially contaminating landuses. It has been critical in these projects to provide timely technical guidance, working to ensure the environment, public health and worker protection were maintained. As an independent and specialist auditor, Ross has at times been required to adopt a sensitive and consultative communications approach to “innocent parties”. In providing objective technical guidance Ross has developed and maintained the trust of the local community, trade union movement, local council and regulatory agencies. The balancing of community expectations, developer construction/remediation deadlines and regulatory/planning controls have demanded close active management. Recent projects have included:

- Former gasworks discovered under 12 inner Sydney residential properties, statutory site audit to confirm suitability following remediation, 2004 to 2006.
- Parramatta to Chatswood Rail Link, Transport Infrastructure Development Corporation (TIDC), 2005.
- M5 East Road Corridor, BHBB Joint Venture Project Team, 2005.
- Remedial Works Department of Defence Site Randwick, Randwick City Council, 2005
- Remediation Former Gasworks, Mortlake, Concord Council, 1994 to 2004.

Community Communications Management
Ross has been responsible for the technical components of the remediation of numerous contaminated site cleanups. Recent examples of this work include involvement with the community

consultation for a former chemical plant clean up in Balmain, NSW and acting as expert advisor to an unfortunate local council for the assessment and cleanup of a former pole treatment facility that had a residential estate built over it.

Legal Support

Ross has fulfilled the role of expert witness for disputes between Government Agencies, Consultants, Site Owners, Leaseholders, Developers and others in regard to the environmental compliance, waste management and remediation of contaminated sites. Ross has also provided professional support to Commissions of Inquiry into the expansion of the Lucas Heights Landfill and for the expansion of the Pasminco Smelter at Boolaroo, NSW. In New Zealand, Ross was expert witness in the High Court, in relation to contaminated land issues between a landholder and leaseholder.

Contaminated Land Management

Ross has had direct involvement in the remediation of many hundreds of contaminated sites, ranging from small ($20,000) clean-ups to highly complex $70 million remediations. This work included complex decision-making based on a thorough understanding of the technical, planning, financial and political issues that revolve around the clean up of contaminated lands. Ross also has provided detailed recommendations to industry in the assessment and management of industrial and hazardous waste streams management, both as regulatory, and previously as environmental consultant. This work included the development of a waste stream database for the Newcastle area to allow cost/benefits analysis and conceptual engineering designs for a proposed hazardous/industrial waste treatment facility. Ross was appointed specialist advisor for the Regional Land Management Corporation (RLMC) in the review of appropriate alternative remedial technologies and processes for former BHP steelworks (Mayfield Closure Area). As a result, Ross has a first-hand understanding of the key environmental and cost-sensitive issues associated with the Site's remediation and future development.

Publications

Ross has numerous articles published in peer reviewed professional journals or conference proceedings and has made many hundreds of presentations, ranging from small technical seminars to international symposia. A complete list of this work is available on request.

Worldwide Locations

Australia	+61-2-8484-8999
Azerbaijan	+994 12 4975881
Belgium	+32-3-540-95-86
Bolivia	+591-3-354-8564
Brazil	+55-21-3526-8160
China	+86-20-8130-3737
England	+44 1928-726006
France	+33(0)1 48 42 59 53
Germany	+49-631-341-13-62
Ireland	+353 1631 9356
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Netherlands	+31 10 2120 744
Philippines	+632 910 6226
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Turkey	+90-312-428-3667
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