Overview of the Contaminated Land Management Process in NSW

The contaminated land management (CLM) process has been likened to being on a toll way, with various exits along the way. The objective is to get a site off the toll way at the earliest, appropriate exit; noting that it can be costlier and more time consuming to get back onto the toll way if one has exited prematurely.

The CLM process, including assessment of site contamination, generally includes the sequential steps of:

1. Preliminary site investigation (PSI) – consisting of a desktop review of available historical and environmental information, coupled with site inspections to ascertain physical condition and likely contamination issues. At times, PSIs include limited environmental sampling and analysis.

2. Detailed site investigation (DSI) – consisting of site investigations of sampling, field screening and laboratory analysis of environmental media; potentially soil, soil gas, groundwater, surfacewater, sediment and/or air. Targets potential contaminants of concern (PCOCs) identified in the PSI and prior investigations, to determine the extent and magnitude of any contamination. Health risk assessments may also be conducted as part of the DSI, to assist with developing site-specific requirements.

3. Remediation or remedial action plan (RAP) – developed if required, to determine the extent, magnitude and methods of site clean-up to be implemented, to remediate the identified contaminants to make the site suitable for the proposed uses. The proposed validation of the remedial works should also be documented. RAP's can be relatively simple for small hotspot removal, to detailed, multifaceted plans for remediation of complex sites with various impacted media, such as former gasworks or large industrial sites, with soil, soil gas and groundwater impacts.

4. Remediation – implementation of the physical works documented in the RAP, often including addressing unexpected finds uncovered during the physical works, through a documented unexpected finds protocol (UFP). Includes the development of site and project specific work, health and safety (WHS) plans and environmental management plans (EMPs).

5. Validation – investigations to determine if the remedial works have achieved the objectives, including sampling and analysis of various environmental media for PCOCs following remediation, or confirmation of engineering works, to demonstrate that the site is suitable for the proposed uses. The validation reporting details the remedial works, compliance with regulatory requirements and approvals, and the site validation data.

6. Ongoing management and monitoring – if required, documentation and implementation of the required management and any ongoing monitoring, often within a long-term EMP. Under the CLM framework, legal and public notification requirements exist, which may need to be addressed in the design and land use planning stages of projects. Acceptance of a long-term EMP generally requires that there is no off-site migration of contamination, or where there is off-site migration or its potential, that contamination within the site is managed or monitored so it does not present an unacceptable risk to either the on-site or off-site environments[1].

The objectives of a PSI[2] are to:
– identify past and present potentially contaminating activities;

[1] EPA (2018) *Contaminated Land Management; Guidelines for the NSW Site Auditor Scheme (3rd edition)*.

[2] Office of Environment & Heritage (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*.

- identify potential contamination types;
- discuss the site condition;
- provide a preliminary assessment of site contamination; and
- assess the need for further investigations.

If required, a DSI[2] should give comprehensive information on:
- the issues raised in the PSI; and
- the type, extent and level of contamination.

DSIs should asses:
- contaminant dispersal in air, surface water, groundwater, soil and dust;
- the potential effects of contaminants on public health, the environment and building structures;
- where applicable, off-site impacts on soil, sediment, waters and biota; and
- the adequacy and completeness of all information available to be used in making decisions on remediation.

The RAP[2] should:
- set remediation goals that ensure the remediated site will be suitable for the proposed use and will pose no unacceptable risk to human health or to the environment;
- document in detail all procedures and plans to be implemented to reduce risks to acceptable levels for the proposed site use;
- establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner; and
- identify and include proof of the necessary approvals and licences required by regulatory authorities.

Where remedial actions have been carried out, the site must be 'validated' to ensure that the objectives stated in the RAP have been achieved. A report detailing the results of the site validation is required, and this must confirm statistically that the remediated site complies with the clean-up criteria set for the site. The validation report should also include information confirming that all regulatory authorities' licence conditions and approvals have been met. In particular, documentary evidence is needed to confirm that any disposal of soil off-site is done in accordance with the waste regulatory framework[1].

The process also permits contamination to remain onsite, contained in purpose-built cells or beneath capping, slabs or structures, providing that no off-site impacts are occurring and that appropriate management is conducted; suitable to the proposed landuse. At times, this includes ongoing monitoring and reporting. Suitable planning approval and notification requirements need to be achieved, and the scale of ongoing monitoring and management should be commensurate with the scale of remaining contamination.

It should be noted that while described as a step-wise process, various activities can occur in tandem, and that investigations can be conducted at various stages, e.g. multiple investigations may be conducted as part of the DSI in an iterative fashion, remedial investigations may be undertaken to confirm the suitability of proposed remedial strategies, or multiple validation investigations may occur based on staged or further remediation.

These steps are further explained, as are the requirements for the investigation design component, which uses the established CLM planning tools of conceptual site models (CSMs), data quality objectives (DQOs), and sampling, analysis and quality plans (SAQPs). These planning tools must be applied for each investigative stage of the CLM process.

Systematic planning of projects is integral to the success of CLM projects, and includes the established design tools of conceptual site models (CSMs), data quality objectives (DQOs) and sampling, analysis and quality plans (SAQPs) for specific investigations, coupled with higher

level strategic planning, to address the desired endpoints and the associated physical, commercial and regulatory requirements to achieve those endpoints.

Site audit

In NSW, the site assessment and site audit process includes the following:

1. the contaminated land consultant, or other relevant party, designs and implements the site assessment and, where required, all remediation and validation activities to achieve the stated objectives; and

2. the site auditor independently reviews the works undertaken to ensure that they comply with current regulations, standards and guidelines, and that the site has been assessed, remediated and validated or managed to a standard appropriate to the proposed land use.

The NSW EPA[3] describes the following in relation to contaminated land site audits:

> *The NSW site auditor scheme is administered by the Environment Protection Authority (EPA) under Part 4 of the Contaminated Land Management Act 1997 (CLM Act). The scheme provides a pool of accredited 'site auditors' who can be engaged to review investigation, remediation and validation work conducted by contaminated land consultants.*
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> *The aim of the scheme is to ensure the protection of the environment and human health through proper management of contaminated land, particularly during changes in land use. The scheme improves community access to competent technical advice on the investigation and remediation of contaminated land, and provides increased certainty in the 'sign-off' of contaminated land assessments and remediation.*
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> *The assessment and remediation of contaminated sites is technically difficult because of the complex behaviour of chemicals in the environment and their myriad effects on ecosystems and human health. Expert review of a consultant's work helps to determine the reliance that can be placed on their assessment and/or remediation.*

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By understanding the technical and regulatory requirements, and following the well-established CLM process summarised above, contaminated land assessment and management projects can be run efficiently and smoothly, allowing land use certification to be achieved in a cost and time-effective manner.

Please feel free to contact us for information on how we may assist on your contaminated land project or visit our website for further details, including Easterly Point's range of services, clients, project examples and technical publications: www.easterlypoint.com

[3] NSW EPA, https://www.epa.nsw.gov.au/your-environment/contaminated-land/site-auditor-scheme.