

# Implementation of the *National Environment Protection (Assessment of Site Contamination) Measure 1999*

Updated July 2016

*EPA 1025/16: This information sheet describes how the ASC NEPM 1999 should be applied in South Australia by site contamination auditors and consultants while the EPA is reviewing its existing site contamination guidance. This guidance applies to site contamination auditors and consultants.*

## Introduction

The assessment of site contamination is a process incorporating a set of formal methods used for determining the nature, extent and concentrations of chemical substances either on or off-site, and the actual or potential risk to human health or the environment, resulting from those substances.

The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM) provides recommended methods for assessment in Australia and was amended in 2013. A review of existing site contamination guidance was initiated by the EPA to support the amendment to the ASC NEPM. The guidance described in this information sheet provides a framework for the implementation of the ASC NEPM, prior to the completion of the EPA review.

Any currently published versions of existing guidelines remain in effect until the final publication of revised documents following completion of the review process.

## The ASC NEPM

The ASC NEPM is a significantly updated and extensive series of health and environmental documents comprising a policy framework (the Measure) supported by a flow chart of the recommended process for site assessment (Schedule A) and a series of nine technical guidelines:

- Schedule B1 Guideline on investigation levels for soil and groundwater
- Schedule B2 Guideline on site characterisation
- Schedule B3 Guideline on laboratory analysis of potentially contaminated soils
- Schedule B4 Guideline on site-specific health risk assessment methodology
- Schedule B5a Guideline on ecological risk assessment
- Schedule B5b Guideline on methodology to derive ecological investigation levels in contaminated soils

- Schedule B5c Guideline on ecological investigation levels for arsenic, chromium (III), copper, DDT, naphthalene, nickel and zinc
- Schedule B6 Guideline on the framework for risk-based assessment of groundwater contamination
- Schedule B7 Guideline on derivation of health-based investigation levels
- Schedule B8 Guideline on community engagement and risk communication
- Schedule B9 Guideline on competencies and acceptance of environmental auditors and related professionals.

The ASC NEPM is supported by a toolbox which contains additional information including calculators, spreadsheets and other supporting documents to assist with the application of the ASC NEPM.

## Key components

Schedule A of the ASC NEPM describes the tiered or staged site assessment process. Tier 1 comprises preliminary site investigations (PSI) and detailed site investigations (DSI). Tier 2 and Tier 3 investigations comprise site-specific risk assessments.

Schedule B2 of the ASC NEPM identifies the key components of site contamination investigations as follows:

- desktop studies
- site inspection
- site history
- development of a conceptual site model (CSM)
- identification of data gaps
- development of data quality objectives (DQO)
- design of sampling strategy, and sampling and analysis quality plans (SAQP)
- data collection
- data validation, analysis and interpretation including risk assessment and iterative development of the CSM
- coherent, accurate and reliable reporting.

The EPA expects that these components will be adequately considered and addressed in all site contamination assessment and that assessment and audit reports will be prepared in accordance with the ASC NEPM.

## Application of investigation and screening levels

The ASC NEPM provides a suite of Tier 1 investigation levels, screening levels and management limits. Each Tier 1 level has specific application considerations (including land-use scenarios, depth, soil type and properties) with limitations required to be considered on a site-specific basis.

Detailed guidance on the application of investigation and screening levels and supporting references are provided in the ASC NEPM and supporting toolbox. Auditors and consultants are expected to familiarise themselves with this guidance and demonstrate the suitability of the application of selected investigation and screening levels in reports.

In relation to the appropriate application of Tier 1 levels, appropriate data analysis including summary statistics should be applied as described in Schedule B1 and B2 (section 13). As a minimum, the maximum and 95% UCL of the arithmetic mean should be compared to the Tier 1 levels.

## Groundwater

During the guideline review period, the EPA expects groundwater assessments to be carried out in accordance with the guidance provided in the appropriate schedules of the ASC NEPM (including Schedules B1, B2 and B6).

However, appropriate consideration should be given to the information and processes described in the current EPA publication *Site contamination: Guidelines for the assessment and remediation of groundwater contamination*. The components that would be addressed as a part of the SRA and DRA should be incorporated as part of the Tier 1 PSI and DSI investigations and reporting. However a section should be provided in any report, which clearly documents the SRA/DRA components addressed and included within that report (refer to Appendix 3 of the guideline for reporting requirements).

The EPA Guideline *Notification of site contamination that affects or threatens underground water pursuant to section 83A of the Environment Protection Act 1993* (December 2008) refers to the current EPA information sheet *How to determine actual or potential harm to water resulting from site contamination* (December 2008). This publication makes reference to the published water quality criteria in the now ceased *Environment Protection (Water Quality) Policy 2003*<sup>1</sup>.

During the review period, the approach to the determination of harm to water remains as described in the current EPA publication *Site contamination: How to determine actual or potential harm to water that is not trivial resulting from site contamination*. This involves comparison of groundwater quality against the water quality criteria for the relevant protected environmental values included in Schedule 2 of the former *Environment Protection (Water Quality) Policy 2003*. Care should be taken not to substitute the ASC NEPM groundwater investigation levels (GILs) for the purpose of this determination.

## Vapour assessment

An assessment framework for vapour intrusion is described in section 9 of Schedule B2. This section also describes the basic requirements for the measurement of volatile organic compounds in soil vapour, indoor air and outdoor (ambient) air. It also provides key references for further information. A multiple-lines-of-evidence approach based on representative site data and conceptual site models is expected to be followed for the adequate assessment of vapour risk.

The assessment of vapour risk is a specialist area. Schedule B9 of the amended ASC NEPM provides updated guidance for environmental practitioners on demonstrating competencies relevant to work being undertaken. In relation to vapour assessment, this is now specifically addressed through the inclusion of 'soil gas sampling design and methodology' and 'air quality (volatile emissions and dust) assessment relating to contamination' as technical competencies.

## Petroleum hydrocarbons

The application of the petroleum hydrocarbon health screening levels (HSLs) must be in the context of the site assessment framework described in the ASC NEPM. The framework includes the application of ecological screening levels (ESLs) for consideration of ecological risks and management limits for consideration of risks to in-ground infrastructure, formation of low density non-aqueous phase liquids (LNAPL), fire and explosion hazards and aesthetic issues.

The HSL methodology provides for a greater range of site circumstances such as soil texture and the depth of contamination. It can also take into account biodegradation if certain conditions are fulfilled. As such, the application of the HSLs is substantially more involved than is commonly the case for Tier 1 investigations.

It is the responsibility of site contamination auditors and consultants to become familiar with the range of limitations and sensitivities associated with the HSLs and their correct application prior to their use in site assessment. A completed copy(s) of the 'HSL Application Checklist' is to be included in any report where HSLs have been applied. Completion of

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<sup>1</sup> The *Environment Protection (Water Quality) Policy 2015* came into effect on 1 January 2016.

the checklist will assist in identifying when site circumstances may require a site-specific approach, such as a shallow groundwater source (less than 2 m depth), groundwater in contact with foundations/basement, or rock at surface or very near-surface.

Consultants and auditors should be aware of the variation in the banding of total petroleum hydrocarbon (TPH) and total recoverable hydrocarbon (TRH) fractions and consider any implications when comparing results for sites with historical data.

Consultants and auditors should also ensure that clear statements are provided in reports where the HSLs have been applied which document how the TRH F1 and F2 fractions have been calculated, including how naphthalene has been analysed by the laboratory.

The CRC CARE has recently published additional guidance in relation to petroleum hydrocarbon vapour intrusion assessment<sup>2</sup>. When used, this guidance should be applied with reference to the vapour assessment framework described in the ASC NEPM.

## Asbestos

The ASC NEPM provides specific guidance in relation to the assessment of asbestos site contamination (refer Schedule B1, Sections 4 and 5, and Schedule B2, Section 11). This guidance has been developed with regard to the publication *Guidelines for the assessment, remediation and management of asbestos-contaminated sites in Western Australia* published by the Western Australia Department of Health in May 2009.

The WA Health Guidelines also provide detail in relation to site remediation, management and reporting in relation to asbestos site contamination. The document should be referred to for additional guidance. Specific enquiries in relation to the management of asbestos site contamination in South Australia should be made with the EPA.

## How to obtain copies of the ASC NEPM and access the Toolbox

Information on the ASC NEPM and how to access copies of the documents and the supporting toolbox is available through the website for the National Environment Protection Council (NEPC)<sup>3</sup>.

A list of errata is also available.

Any enquiries in relation to the implementation of the amended ASC NEPM in South Australia can be directed to the Site Contamination Branch on tel: 8204 9934 or email [epasitecontam@epa.sa.gov.au](mailto:epasitecontam@epa.sa.gov.au).

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## Further information

### Legislation

[Online legislation](#) is freely available. Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet  
Adelaide Service SA Centre  
108 North Terrace  
Adelaide SA 5000

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<sup>2</sup> CRC CARE 2013, *Petroleum hydrocarbon vapour intrusion assessment: Australian guidance*, CRC CARE Technical Report no. 23, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

<sup>3</sup> [www.nepc.gov.au/nepms/assessment-site-contamination](http://www.nepc.gov.au/nepms/assessment-site-contamination)

Telephone: 13 23 24  
Facsimile: (08) 8204 1909  
Website: <[shop.service.sa.gov.au](http://shop.service.sa.gov.au)>  
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## **General information**

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