



**Review of the
National Environment Protection
(Assessment of Site Contamination)
Measure**

Issues Paper

June 2005

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1 BACKGROUND

1.1 NATIONAL ENVIRONMENT PROTECTION COUNCIL

The National Environment Protection Council (NEPC) is a national body established by State, Territory and Commonwealth Governments. The objective of the NEPC is to work cooperatively to ensure that all Australians enjoy the benefits of equivalent protection from air, water, soil and noise pollution and that business decisions are not distorted nor markets fragmented by variations in major environment protection measures between member Governments. The NEPC stems from the Inter-Governmental Agreement on the Environment 1992, which agreed to establish a national body with responsibility for making National Environment Protection Measures (NEPMs). The NEPC and its operations are established by the *National Environment Protection Council Act 1994* (Commonwealth) and corresponding State and Territory Government Acts. Since May 2002, NEPC has met in conjunction with the Environment Protection and Heritage Council (EPHC). NEPC remains the legal entity for developing and making NEPMs.

NEPMs are broad framework-setting statutory instruments, which, through a process of inter-governmental and community/industry consultation, reflect agreed national objectives for protecting particular aspects of the environment. NEPMs may consist of any combination of goals, standards, protocols, and guidelines, although for the assessment of site contamination, the NEPC Acts specify that guidelines may be developed.

Implementation of NEPMs is the responsibility of each participating jurisdiction. A NEPM will take effect in each participating jurisdiction once it is notified in the *Commonwealth of Australia Gazette*, but is subject to disallowance by either House of the Commonwealth Parliament. Any supporting regulatory or legislative mechanisms that jurisdictions might choose to develop to assist in implementation of proposed NEPMs go through appropriate processes in those jurisdictions.

1.2 ASSESSMENT OF SITE CONTAMINATION NEPM

Contaminated sites are recognised as a major environmental issue for Australia. In addition to posing a possible threat to public health and the environment, contaminated sites have significant economic, legal and planning implications. Australia, as a signatory to the Rio Declaration, is committed to conserving, protecting and restoring the health and integrity of Australia's ecosystems. The development of the National Environment Protection (Assessment of Site Contamination) Measure, (hereinafter in this document referred to as the NEPM), was a significant step to ensuring that commitment was met.

In developing the NEPM, the NEPC recognised that, in the face of increasing pressure to redevelop former industrial and agricultural land, there was a need to ensure that appropriate processes were in place to properly assess potentially contaminated sites. There was also a growing recognition that the developmental and environmental needs of present and future generations must be considered when dealing with contaminated sites. The development of the NEPM was a significant move to ensure that environmental protection became an integral part of the assessment of site contamination.

The NEPC also recognised that the development of the NEPM was only part of the necessary requirements to ensure that site contamination was managed in an environmentally responsible manner. Accordingly those matters that are outside the province of the NEPC Act, such as the management and remediation of contaminated sites, will continue to be dealt with through other processes.

The purpose of the Assessment of Site Contamination NEPM is to establish a nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community which includes regulators, site assessors, environmental consultants, auditors, landowners, developers and industry.

The desired environmental outcome for this NEPM is to provide adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and effective national approach to the assessment of site contamination.

1.3 REVIEW OF THE ASSESSMENT OF SITE CONTAMINATION NEPM

Clause 10 of the NEPM outlines the requirements for a review of the NEPM and states:

- 10 This Measure will be subject to a review five years from the date of commencement, or within any lesser period determined by the Council, which will consider:
 - 15 i. the effectiveness of the Measure in achieving the desired environmental outcome set out within it;
 - ii. the resources available for implementing the Measure; and
 - iii. the need, if any, for amending the Measure, (in accordance with the Act) including:
 - 20 – whether any changes should be made to the Schedules; and
 - whether any changes should be made to improve the effectiveness of the Measure in achieving the desired environmental outcome set out within it.

The NEPM was gazetted on 22 December 1999, and so the five-year review was due to commence in December 2004. Accordingly, in April 2004 NEPC Committee agreed to develop a proposal for review of the NEPM for consideration by Council in 2005.

In December 2004 the Council agreed to the terms of reference for the review that incorporate the issues referred to in clause 10 of the NEPM.

2 PROCESS FOR THE REVIEW

2.1 REVIEW TEAM

A Review Team, comprising a project chair from Western Australia and members from South Australia, Western Australia, Queensland, Victoria as well as the health sector (Commonwealth), with an observer from New Zealand and a corresponding member from New South Wales, is conducting the Review. The NEPC Service Corporation provides the Project Manager. The Review Team is accountable to the NEPC through the NEPC Standing Committee and will prepare a report and recommendations to NEPC Committee and NEPC.

2.2 CONSULTATION

The Assessment of Site Contamination NEPM is the premier guidance document in Australia for the assessment of land contamination. It addresses a complex area that is particularly subject to new developments in scientific knowledge and new technologies, as recognised during the development of the NEPM. Given these complexities the review will take account of an extensive range of factors and a significant amount of information from workshops organised by the NEPC Technical Working Group and others.

A Jurisdictional Reference Network (JRN) and a Non-government Organisation (NGO) Advisory Group have been established to provide policy, technical and operational advice and information. This Issues Paper is available on the EPHC website and you are invited to make a submission (see Section 2.6 below).

2.3 PROCESS

The review process comprises the following components:

- establishment of Review Team and JRN and NGO Advisory Group
- development of a draft Issues Paper
- meeting of JRN and NGO Advisory Group to consider the draft Issues Paper
- release of the Issues Paper, public consultation and call for submissions
- assessment of submissions and preparation of a Discussion Paper
- release of Discussion Paper, public consultation and call for submissions
- development of review report and recommendations to NEPC Committee.

2.4 TIMEFRAME

The review commenced in February 2005 and is due to be completed in August 2006. It is anticipated that NEPC Committee will consider the review report in September 2006. This time-line will enable Council to consider the report and to make any decisions as to whether a variation process to the NEPM should be initiated, in October 2006.

2.5 TERMS OF REFERENCE FOR THE REVIEW

The terms of reference for the review are based on Clause 10 of the NEPM (refer section 1.3). This includes a review of existing schedules to ascertain their relevance and the need to update information provided.

2.6 PURPOSE OF ISSUES PAPER

The purpose of this Issues Paper, and on which stakeholder comments are invited is to identify and discuss the key issues that are to be addressed in the Review of the Assessment of Site Contamination NEPM. The paper does not stipulate a position on any issue, and as such does not reflect the views of the Commonwealth or state and territory governments.

The paper outlines issues raised by the Review Team, NGO and JRN. Issues presented in text-boxes are to prompt discussion/submissions. Issues additional to those presented in this paper can be raised in submissions.

This Issues Paper is available on the EPHC website <www.ephc.gov.au> for comment for a period of six weeks from Monday 6 June 2005 to **Friday 15 July 2005**. After examination of comments received, and of the issues as outlined in this paper, the review team will develop a Discussion Paper that canvasses the options for addressing the issues raised and for improving the implementation of the NEPM.

All submissions are public documents unless clearly marked “confidential” and may be made available to other interested parties, subject to Freedom of Information Act provisions.

2.6.1 Form of Submission

An electronic form for lodging comments is available. The form can be emailed to you by the NEPC Service Corporation or downloaded from the EPHC website <www.ephc.gov.au>. This form can be filled out and submitted electronically.

Should you wish to provide your comments in another format, submissions may be made by:

- email to mgilbey@ephc.gov.au
- on a 3.5 inch floppy disk
- CD Rom, or
- in hardcopy to:

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Fax (08) 8224 0912

Submissions should be received by the NEPC Service Corporation by close of business **Friday 15 July 2005**.

To allow ease of photocopying, hardcopy submissions should be unbound. Electronic submissions should preferably be provided as a Word for Windows file.

3 ASSESSMENT OF NEPM EFFECTIVENESS

3.1 THE EFFECTIVENESS OF THE NEPM IN ACHIEVING THE NATIONAL ENVIRONMENT PROTECTION GOAL

The goal and desired environmental outcome of the Assessment of Site Contamination NEPM set out in Clause 5(1) and 5(2) are as follows:

The purpose of the Measure is to establish a nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community which includes regulators, site assessors, environmental auditors, land owners, developers and industry.

The desired environmental outcome for this Measure is to provide adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and effective national approach to the assessment of site contamination.

3.2 NEPM OVERVIEW

The NEPM comprises an overarching framework for the assessment of site contamination and its relationship to the management of site contamination. It is supported by ten guidelines on various technical and administrative aspects of site assessment.

The NEPC Act specifies that the NEPM is to be confined to the assessment of site contamination - **management and remediation of site contamination is outside the scope of the NEPM and responsibility lies with individual jurisdictions in accordance with their legislative requirements**. Nevertheless, it is a NEPM requirement that the assessment processes are sufficient to develop adequate management and remediation strategies. It is the responsibility of jurisdictions to implement the NEPM in accordance with their legislative and administrative framework.

The NEPM and its implementation is a significant tool for the protection of human health and the environment with the redevelopment of sites, particularly former industrial areas (urban renewal areas) in Australian cities. There is a continuing trend for redevelopment of former industrial areas for commercial and residential uses. Many of these former industrial areas may have hazardous substances in the soil and groundwater as a result of poor or inadequate operational practices associated with the manufacture, use and disposal of chemicals. These substances can cause environmental and health concerns in their current state or when disturbed, or may render the land unsuitable for more sensitive land uses such as residential, educational and child care facilities. Often, the extent and degree of contamination at a site is dependent upon its physical characteristics such as soil type, depth to groundwater, or proximity to sensitive environments such as wetlands and rivers. Each contaminated site is therefore unique.

3.3 NEPM IMPLEMENTATION

The establishment of the NEPM as a nationally consistent approach to the assessment of site contamination has provided a common basis for interactions between agencies in jurisdictions across Australia. The NEPM has been recognised by environmental auditors, consultants, developers and others as a comprehensive source of guidance.

The NEPM is implemented in conjunction with existing jurisdictional guidelines and provides support in jurisdictions where guidance for specific aspects of site assessment has not yet been developed. The NEPM guidelines are used predominantly by consultants in the private sector who undertake site assessment work.

Each of the jurisdictions has developed regulatory or administrative frameworks and arrangements with which to implement the NEPM. As required by the NEPC Acts, each jurisdiction reports on NEPM implementation activities each year to NEPC. These reports are published in the NEPC Annual Report. A summary of the implementation framework and implementation activities for the 2003-04 reporting year are included as Table 1 and Table 2 respectively in Appendix 1.

3.4 NEPM EFFECTIVENESS

The nature of the NEPM as a set of assessment guidelines is such that it is difficult to provide quantitative measurements of effectiveness. Difficulties involve the highly site specific nature of site contamination, the various possibilities for proposed land uses, planning requirements in each location and the differing legislative frameworks that apply to the assessment and management of site contamination in each jurisdiction. An appropriate standard of assessment work is required to provide protection of human health and the environment, however, there are no set criteria to measure this standard.

The attainment of consistent national practice in site assessment (transparent processes, resource use and improvements in the standard of site assessment work) is the goal that all jurisdictions aim to achieve.

Issue 1

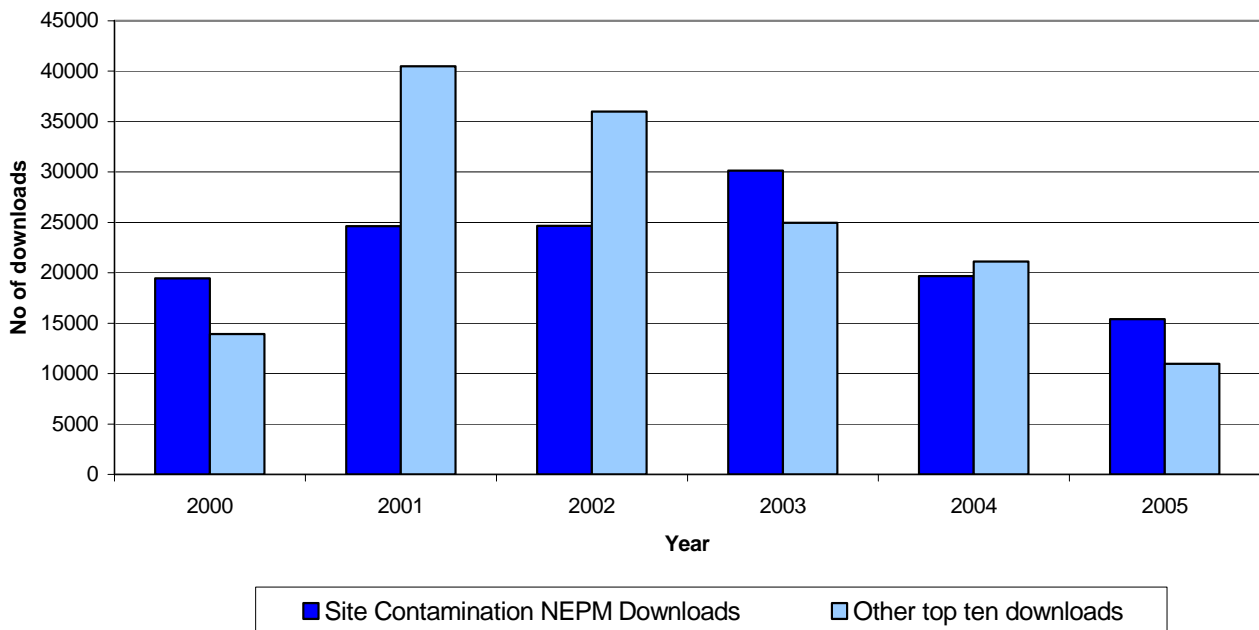
Does the NEPM provide an adequate basis for a nationally consistent approach to sound environmental practice in the assessment of site contamination? Please give reasons/explanation for your views.

There are, however, means by which effectiveness can be indirectly and practically measured that are related to usage of the NEPM and its acceptance by the public and the means by which jurisdiction implements the NEPM.

3.4.1 Level of public interest and distribution of the NEPM

The NEPC Service Corporation receives regular reports on the number of hits to the EPHC website. One of these reports lists the top ten monthly downloads of all documents on the website. Since its release in December 1999, the Assessment of Site Contamination NEPM and a number of its associated schedules have consistently been the most downloaded of NEPMs and associate documents. Figure 1 below shows the number of Assessment of Site Contamination NEPM downloads compared to other documents in the top ten which have been downloaded from the EPHC website. Significantly higher downloads of other documents can be attributed to releases of new documents e.g. Review of the National Pollutant Inventory NEPM, Diesel Vehicle Emissions NEPM.

**Figure 1: January 2000 - April 2005
Site Contamination NEPM downloads compared to other top ten downloads**



Website reports and requests to the NEPC Service Corporation for copies of the NEPM show that the NEPM is sought after - within Australia and internationally - by consultants, educational institutions and members of the public.

The NEPC Service Corporation also receives requests for hard copy or CD Rom versions of the NEPM.

3.4.2 Level of public confidence

The NEPC Service Corporation often receives phone calls or e-mails from members of the public querying the application or use of NEPMs. The bulk of public contact is in relation to the Assessment of Site Contamination NEPM. In most cases, the query relates to information on obtaining a specific guideline from the NEPM or how the NEPM applies in certain jurisdictions. Occasionally, technical advice on the application of a guideline is required. The

low level of public complaints and the infrequency of requests for technical advice demonstrate that the NEPM is relatively user friendly.

3.5 ANNUAL REPORTING BY JURISDICTIONS

5 The NEPC is required by the *National Environment Protection Council Act 1994* (section 24) to report on the overall assessment of the implementation and effectiveness of NEPMs and to have regard to reports on NEPM implementation from the Commonwealth, state and territory Governments.

10 Annual reporting on the effectiveness of the NEPM is based on “General Criteria” specified in the NEPC Implementation Reporting Protocol only. “Specific Criteria” have not been set. The “General Criteria” is as follows:

- progress in implementing the NEPM
- compliance by parties bound by the NEPM with NEPM protocols and/or other NEPM reporting requirements
- 15 • progress towards achievement of the NEPM goal, the desired outcomes and only NEPM standards
- issues arising that reflect on the efficiency and simplicity of the NEPM administration.

20 Each jurisdiction has differing regulatory and administrative frameworks for implementing the NEPM.

Issue 2

Are there other indicators that jurisdictions could use to demonstrate the effectiveness of the NEPM?

Given the performance measurement difficulties how can the NEPM be better evaluated for effectiveness?

3.6 JURISDICTIONAL RESOURCES FOR IMPLEMENTING THE NEPM

25 Jurisdictions have committed resources to the implementation of the NEPM to help ensure that NEPM guidelines assessment procedures are applied appropriately when conducting and reporting site assessments, and, to report to NEPC on the implementation of the NEPM.

Issue 3

Are the current jurisdictional resources available for implementing the NEPM adequate to meet the goal of the NEPM?

30 Some jurisdictions have expressed resourcing difficulties in meeting the information and guidance needs of consultants with limited experience in site assessments in remote areas of their state. Lower land values, together with the significant distance from larger population centres with developed consultancies, can create greater cost burdens relative to the process and skills available in and near capital city centres.

35

Issue 4

How might the current system be modified to improve efficiencies for government and the private sector, while maintaining the effectiveness of the NEPM?

4 IMPLEMENTATION ISSUES FOR CONSIDERATION

The issues outlined below have been identified by the Review Team, NGO and JRN for consideration in relation to the coverage and application of the existing guidelines. **Submitters may identify other issues that need further development and clarification. These matters should be raised in submissions to ensure identification of all issues of concern.**

4.1 INVESTIGATION LEVELS

The NEPM refers to three different types of investigation levels: Ecologically-based Investigation Levels (EILs), Health-based Investigation Levels (HILs) and Groundwater Investigation Levels (GILs). An investigation level is the concentration of a substance above which further appropriate investigation and evaluation will be required.

HILs and EILs are not clean up or response levels, nor are they desirable quality criteria. They are to be used for the assessment of existing contamination only and are intended to prompt an appropriate site specific assessment when they are exceeded. Inappropriate use of investigation levels as default remediation criteria may result in unnecessary remediation adding to development costs, causing unnecessary disturbance to the site and local environment and potential waste of valuable landfill space. Similarly, it is an abuse of investigation levels if they are interpreted as condoning contamination to these levels. Nevertheless, in practice, there appears to be misuse of these criteria.

Issue 5

What guidance, if any, should be provided for the use of investigation levels in site assessments and in the conduct of risk assessment? For example, how can the misuse of investigation levels as clean-up criteria be avoided?

Issue 6

Should investigation levels be developed for other substances, not already listed in the NEPM, and how should the priority be set for developing investigation levels for these substances?

4.1.1 Ecological Investigation Levels (EILs) – Schedules B(1) and B(5)

Schedule B(1) of the NEPM provides interim urban EILs for land use relating to city, suburban and industrial areas. These levels were based on considerations of phytotoxicity for some metals and background soil survey data from residential and other inner city and suburban areas in Australian capital cities. It was acknowledged at the time that the adopted values were opportunistic and conservative and may not apply to all ecological receptors.

There are difficulties for regulators, auditors and consultants with some contaminants where HILs are generally higher than EILs. If an HIL is selected as a trigger for investigation, there is a potential for ecological receptors to be impacted. Conversely, it is possible that the use of EILs only as triggers for investigation may result in conservatism.

An example is where for Residential Setting A, the HIL for metals trivalent chromium at 12% and zinc at 7000 mg/kg, are significantly higher concentrations compared to EILs of 400 mg/kg and 200 mg/kg respectively. Should decisions on site management be made using the EIL, this would be conservative in terms of the protection of human health. On the other hand, in the same instance, if the HILs only were taken into account, impact to the ecosystem may apply.

Issue 7

What are the difficulties, if any, in applying the interim urban EILs in site assessment and management strategies?

Schedule B(5) of the NEPM, *Guideline on Ecological Risk Assessment* provided a three-stage process to establish ecological risk and soil EILs in a site or specific area. However, no detailed methodologies were provided on how to develop EILs. During the development of the NEPM, a methodology based on the food-web model was proposed as part B of the Ecological Risk Assessment Guideline, but was considered to be insufficiently developed for practical use. It was further recognised that the development of EILs based on the food-web methodology was resource intensive and that there was a lack of relevant data on Australian species for this approach. A nationally agreed methodology for deriving terrestrial EILs is yet to be determined.

Issue 8

Should consideration be given to revising the framework for setting EILs so that they can be made specific for certain land uses? For example:

- in the absence of specific sensitive ecological receptors, would it be appropriate to have different EILs applied to urban environments for normal landscaping, residential use and public open spaces and to other land uses such as rehabilitated mine sites?

Since the NEPM was implemented, there has been useful national and international research for some contaminants in a number of areas that may assist developing more scientifically justifiable EILs. While nationally agreed methodologies for risk assessment on terrestrial ecosystems are yet to be developed, the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (WQG 2000), by the then Australian and New Zealand Environment and Conservation Council (ANZECC) and the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), outline a national ecological risk approach for the protection of defined environmental values for aquatic ecosystems. The guidelines were developed using the Species Sensitivity Distribution (SSD) approach which is recommended by the OECD.

Issue 9

What approach should be used to derive EILs and how can relevant research on soil contaminants since 1999 be better utilised in site assessment? For example, should the approach be consistent with the SSD model for deriving the WQG 2000, or other internationally accepted approaches?

Issue 10

What improvements could be made to the NEPM Schedule B(5) guideline on Ecological Risk Assessment to reflect developments in this area since 1999?

4.1.2 Health-Based Investigation Levels (HILs) – Schedule B(7a)

HILs incorporate assumptions about the general population exposure and the exposure scenario. Site- and context-specific considerations may allow concentrations above the guidance values to be acceptable. Currently, a 'residential' land use setting is employed for deriving the guidance value and values are based on a default exposure scenario for a two year old child.

The general method for deriving HILs is to allocate a proportion of the Tolerable Intake (based on lifetime exposure) to the various sources of exposure, either as a fixed percentage, or as a percentage derived from local data on background exposures for each exposure route. The development of the current HILs was for a clearly defined exposure scenario, based on the International Commission on Radiological Protection 'reference man' (WHO, 1994), and using two year old children as the key target group to be used in criteria setting.

Schedule B(7a) of the NEPM lists HILs for common substances in soil in 'residential' land use areas. These levels were compiled from various National Workshops on Health Risk Assessment and Management of Contaminated Land held up to 1999.

There has been one subsequent national workshop, held in 2002¹, at which information was presented to establish, inform, or revise the basis for soil criteria for a range of substances and land use scenarios including benzene, TPHs, chlorpyrifos, bifenthrin imidacloprid, endosulfan, copper, lead, cadmium, arsenic, DDT.

It was acknowledged that the adopted values were generally conservative and were derived using varying assumptions about exposure factors, percentage of Tolerable Intake, exposure routes and body weights, and using the methodology outlined in the World Health Organization Environmental Health Criteria No.170 monograph Assessing Human Health Risks of Chemicals: Derivation of Guidance Values for Health-based Exposure Limits (1994). Some of these values may need to be revised to reflect recent developments in risk assessment methodology, in particular the publication of the enHealth risk assessment and exposure factor documents², the availability of new internationally peer reviewed hazard assessments, and newly refined Tolerable Intakes.

Issue 11

Is the current methodology for deriving HILs adequate? For example:

- what should be the methodology used to develop HILs?
- should all existing HILs be reviewed to ensure consistency and to take account of current knowledge?
- should the health investigation level guideline be developed in conjunction with the national health advisory bodies?

At present the NEPM HIL 'F' exposure scenario considers exposure for adults on commercial or industrial premises. It considers soil ingestion, dermal contact and dust inhalation as exposure pathways, but does not indicate if this applies only to workers with incidental contact with soil (e.g walking across the site, working inside a building etc.) or if it also applies to workers with more direct soil contact (such as digging trenches or other construction maintenance tasks). This means that there is sometimes uncertainty about whether HIL F should be applied on potentially contaminated sites. A site-specific assessment must be conducted on each such site, without any real guidance about the correct guidance value when considering maintenance and construction workers.

¹ *Proceedings of the Fifth National Workshop on the Assessment of Site Contamination* (2003).

² *Environmental Health Risk Assessment - Guidelines for assessing human health risks from environmental hazards* (2002); and, *Exposure Scenarios and Exposure Settings* (2001)

Issue 12

What other guidance, if any, could be provided about the exposure settings applicable to each of the HIL scenarios? What guidance, if any, should be provided on the application of HILs taking into account exposure settings?

4.1.3 Groundwater Investigation Levels (GILs)

Schedule B(1) of the NEPM provides groundwater investigation levels (GILs) that are based on the NHMRC/ARMCANZ Drinking Water Guidelines 1996 and the ANZECC Australian Water Quality Guidelines (AWQG) 1992. The 1996 Drinking Water Guidelines have been updated in the Australian Drinking Water Guidelines 2004. The 1992 guidelines were updated in the National Water Quality Management Strategy (NWQMS) 2000. The revision of these guidelines was based upon risk-based approaches which are clearly documented in the latest versions of the documents.

Issue 13

Should the GILs in the NEPM be revised utilising the NWQMS 2000 and Australian Drinking Water Guidelines 2004 or are there alternative methods that would be more appropriate to determine investigation levels specific to groundwater (GILs)?

The NEPM provides a risk-based process framework in Schedule B(6) to assess groundwater impacts associated with point source site contamination. This framework must consider the regulatory requirements of each jurisdiction and is not intended for application to broad scale groundwater issues associated with agriculture, catchment management or salinity.

Schedule B(6) of the NEPM outlines how GILs should be used “as investigation levels at the point of extraction and as response levels at the point of use (unless a site specific risk assessment has been carried out and an alternative, more appropriate response level has been determined)”. In practice the GILs are used variously as investigation levels at the point of use or discharge or as response levels for action.

Issue 14

What further guidance should be provided to assist a nationally-consistent approach to the use of GILs in groundwater assessment?

4.2 SPECIFIC SUBSTANCES**4.2.1 Total Petroleum Hydrocarbons (TPH) – Schedule B(1).**

The measurement of Total Petroleum Hydrocarbons (TPH) (or, as sometimes known, total recoverable hydrocarbons, TRH) is intended to assist in the assessment of the impact of fuel components on soil and groundwater. These are, largely, mixtures of aliphatic and aromatic hydrocarbons (MAHs or BTEX and PAHs), and may include other components, such as additives. The individual aliphatic or aromatic components of the petroleum mixtures have similar health and ecological impacts, and so it is convenient to group them together.

There is no set of investigation levels for these compounds consistently used in undertaking risk assessments. Individual assessors and jurisdictions may use criteria derived from overseas standards and some have used criteria developed locally for specific cases, but which have become de facto standards through general use. Currently, research is being undertaken which may lead to the development of HILs/EILs for aliphatic and aromatic hydrocarbons, but this is a longer-term prospect. To achieve consistency in site assessment, it might be desirable to adopt an interim set of HILs/EILs for TPH/aliphatic and aromatic hydrocarbons.

Issue 15

Is there a need for nationally adopted investigation levels for TPH in soils and waters, and by what process should they be developed?

Issue 16

Are there guidelines levels currently being used for the assessment of TPH in soils and waters which could usefully be adopted in the NEPM as interim levels, in order to give national consistency in site assessment?

Issue 17

What are the issues involved with the adoption of an interim set of HILs/EILs for TPH/aliphatic and aromatic hydrocarbons? For example:

- are the impacts of these compounds sufficiently well understood to justify such an approach?
- which set(s) of levels would be chosen for consideration?

5 TPH is a parameter which is defined by the approach used for its measurement. The methodology used for TPH measurement has been in place for a long time. It is relatively unsophisticated and non-specific, and detects a number of compounds which are usually measured by other means such as MAHs, or BTEX, and PAHs. Many of these components have their own EIL or HIL values which are used to trigger a site-specific risk assessment,
10 based on both carcinogenic and non-carcinogenic impacts.

More recent advances in chemical instrumentation may mean that direct measurement of aliphatic hydrocarbons is now possible. Such an approach may give more consistency in assessment, but may also require significant new investment in equipment and training within
15 the laboratory sector. Standards Australia has a working party on TPH determination.

Issue 18

What are the possible benefits of differentiating TPH fractions, based on aliphatic and aromatic hydrocarbons, and developing new measurement methodologies? By what mechanism(s) could such methodologies be developed?

4.2.2 Fuel components - Schedule B(1)

20 The most prevalent sites assessed for contamination are those with current and former fuel storage. These sites include service stations, fuel depots, fuel tank farms, underground (UST) and above-ground (AST) storage tanks for fleet vehicles or industrial machinery for a wide range of industries and provision of generator fuel. Currently the investigation of these sites focuses on parameters such as Total Petroleum Hydrocarbons (TPH), benzene, ethylbenzene, toluene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), and where leaded fuel
25 has been present, lead.

Over the years, a number of substances have been added to fuels to:

- increase fuel burning efficiency by introducing oxygen into fuels (oxygenates e.g. methyl tertiary-butyl ether (MTBE))
- 30 • scavenge lead
- reduce “knocking” in engines.

While the use of some of these has been discontinued, their impacts may still remain, due to the presence of previous contamination from fuel leakages.

5 The use of additives has primarily been driven by requirements to reduce vehicle emissions. However, as these additives are contained within fuels, they may be present in the subsurface where leakage and spillage of fuels has occurred.

10 Studies in the USA have shown that fuel additives and their degradation products have resulted in contamination of groundwater resources. The US EPA has incorporated investigation levels in their drinking water guidelines related to fuel additives. Fuel additives are persistent and highly soluble, and, therefore, mobile in groundwater and may migrate in groundwater ahead of the currently investigated compounds such as BTEX and PAH.

15 MTBE has never been used by any Australian refinery, but may be present in fuels imported from overseas (around 30% of fuel used in Australia). To date, little is known in Australia on the presence of fuel additives in soils and groundwater associated with fuel storage sites.

Issue 19

Under what circumstances should fuel additives and their degradation products be assessed at fuel storage sites? Should a small number of indicator additives be identified which can be used as initial screening substances for the presence of additives in the subsurface?

Issue 20

Should investigation levels for fuel additives be developed for soils and groundwaters/surface waters?

20 **4.2.3 Aspects of assessing asbestos impacts - Schedule B(2)**

Various forms of asbestos are commonly encountered in the assessment of site contamination such as bonded asbestos (fibro cement products) or free fibres (e.g. insulation or lagging). Additionally, asbestos products have differing physical, chemical and biological properties resulting in different potential risks to human health, depending on the likelihood of asbestos fibres becoming air-borne – the greatest risk of exposure to asbestos is through inhalation.

30 The dose-response characteristics of the various fibre types have been extensively studied, but there are limitations to many of these studies due to inadequate testing regimes. Nonetheless a number of them indicate that there may be a threshold concentration for the onset of the effects of asbestos. The risks associated with installed, undisturbed asbestos cement products are negligible, as the fibres are bound together in a solid cement matrix. Even weathered asbestos cement roofing does not release significant amounts of airborne fibres unless the material is significantly disturbed (enHealth Council – *Management of asbestos in the non-occupational environment*, 2005).

35 The issues in dealing with asbestos are:

- the health management measures necessary during the conduct of investigations and particularly any remediation activities
- whether appropriate sampling has been undertaken to implement a suitable remediation strategy
- to ensure the sustainable and adequate protection of human health and the environmental for the reasonable and usual long-term use of a site.

It is noted that asbestos receives only very nominal consideration in the NEPM. As it is not possible to predict the entrainment of asbestos fibres in the soil for release into the atmosphere and the difficulties of determining its concentration in soil, it is currently general practice to use qualitative methods in assessing the extent of asbestos contamination in soils. Given this, alternatives to setting a HIL may need to be considered.

Issue 21

Should the NEPM provide more information and guidance relating to the investigation and assessment of asbestos issues? For example:

- what specific information and guidance should be provided in the NEPM?
- would guidance on methods of qualitative assessment of asbestos be useful?

The document *Management of asbestos in the non-occupational environment* is pending release by enHealth Council and this document provides information to help promote a nationally consistent approach to investigating and managing the risk of asbestos in the non-occupational environment. This is consistent with the purpose and desired environmental outcomes of the NEPM.

4.2.4 Persistent Organic Pollutants (POPs)

Australia is a signatory to the Stockholm Convention on Persistent Organic Pollutants (POPs Treaty) and is currently developing a National Implementation Plan to manage our obligations under the treaty. Chemicals listed in the POPs treaty but for which we have no HILs include:

- endrin
- hexachlorobenzene
- mirex
- toxaphene
- dioxins (polychlorinated dibenzo-p-dioxins)
- furans (polychlorinated dibenzofurans).

Issue 22

Should HILs be developed for those persistent organic pollutants which currently do not have a HIL? Should EILs and GILs also be developed for these substances?

The term "dioxins" describes a group of toxic organic chemicals that persist in the environment for a long time. These compounds can accumulate in the body fat of humans and animals and have a tendency to remain unchanged for prolonged intervals, giving rise to concern for adverse effects in humans. Dioxins serve no useful purpose and are not intentionally produced. They are unintended by-products released in small quantities from some human activities (combustion processes of any type, including power generation, metal works and waste incineration, as well as certain types of chemical manufacture) and some natural activities such as bushfires and volcanic activity. They occur in trace amounts in air, sediments and soil throughout the world. Australia has recently completed a survey of the current levels of dioxins in the Australian environment under the National Dioxins Program (NDP).

The NDP reported that there was, generally, a low risk to human health and the environment from dioxins in Australia. This included an assessment of the presence of dioxins in soils. Detailed technical information on dioxins and their natural and industrial occurrence can be found in the reports of the NDP available from the Commonwealth Department of the

Environment and Heritage website³. It is recognised that the average body burden of dioxins in Australians and New Zealanders is low by international standards. The NDP found that the exposure to the Australian population was from food ingestion. In its recommendations, the NDP Human Health Risk Assessment of Dioxins in Australia report posed the question of whether site investigation triggers for dioxins should be developed and adopted.

Many industrial sites in urban areas are currently being, or planned to be, redeveloped principally for conversion to residential use. This represents an opportunity to ensure that any possible risks from dioxin contamination are assessed and managed where appropriate.

Issue 23

Under what circumstances should dioxins be considered in the assessment of site contamination?

Procedures for sampling and analysis for dioxins are highly specialised, time consuming and expensive. Requiring that dioxins be investigated at all sites, as may be implied by setting HILs, may result in much data of questionable quality being used in making decisions about management of dioxins. In addition, the costs of such processes may act as a barrier to the remediation and re-use of contaminated sites.

There are several well-known and accepted indicator substances (such as phenoxy acid herbicides) which, when present, point to the likelihood of dioxin contamination. Information on site history can identify the activities likely to have given rise to these substances at a site, and provide pointers to the need to conduct sampling and analysis for dioxins. These substances can act as a less complex screening tool for the likely presence of dioxins.

Issue 24

Would it be appropriate to develop a protocol and guidance for investigations to identify the likelihood of the presence of dioxins before requiring that they be measured? For example, assessing the presence of indicator substances of concern.

4.2.5 Assessment of Impacts from Volatile Substances – Schedule B(7a) & B(7b)

The assessment of impacts from volatile substances, particularly intrusion into indoor air, is a rapidly developing field of science. Complex fate and transport mechanisms apply to the exposure assessment process, particularly when assessing potential issues to indoor air. Inhalation, rather than direct ingestion, is recognised as the most sensitive pathway for human intake of volatile substances arising from underground sources (soil and underground waters). The assessment of health impacts from volatile substances is therefore dependent on the methodologies utilised, as well as the processes and procedures used for measuring volatile emissions.

Worldwide, there are few major indoor vapour intrusion models and it may be considered that none of these are based on appropriate modelling nor are suited to Australian conditions. For example, the US EPA has issued draft guidance on this issue, and remains open for comment. In Australia, research is continuing in developing and validating an indoor vapour intrusion model for homes with a sub-floor crawl space, with the aim of developing a matrix of health-based investigation levels (HILs) to assist in the health risk assessment and management of site contamination involving volatile substances. Outcomes from this work are unlikely to be available for several years.

³ <<http://www.deh.gov.au/industry/chemicals/dioxins/reports.html>>

Issue 25

Should the NEPM provide more information and guidance on assessment of the impacts and risks from volatile substances, given the rapid developments in this field of science? If so, what further information and guidance should be provided in the NEPM?

4.2.6 Mixtures

Currently there is no agreed Australian approach to assessing mixtures of substances. Where data (including mechanistic data) are available on the interaction of substances these can be taken into account in the risk assessment. Environmental exposures can frequently involve more than one type of substance and may require a different mode of assessment than for single substance exposures. For such complex exposure scenarios, risk assessment considerations are most advanced for chemical mixtures.

Issue 26

How could mixtures and possible synergistic and antagonistic effects be specifically considered when deriving HILs? Should these also be considered when deriving EILs and GILs?

4.2.7 Carcinogenic substances

In general, similar principles are used for determining HILs for contaminants with and without carcinogenic effects. This is possible because a Tolerable Intake or equivalent guideline exists for many carcinogenic contaminants which are considered to have a threshold effect. For non-threshold carcinogenic contaminants, the generally accepted USEPA practice is to model the human or animal data to derive a "cancer slope factor". A value for chronic daily intake can then be derived by applying a "cancer risk factor" (eg. one in 100,000 or 1 in a million). The NHMRC Working Party on the Cancer Risk Assessment for Environmental Contaminants has trialled an Australian-specific variation on the USEPA methodology for developing guideline values for carcinogenic substances, but this methodology has failed to win broad acceptance amongst risk assessors at this time.

Issue 27

Do we need specific guidance for risk assessment of carcinogens in site assessment? If so, what guidance should be provided?

4.3 SITE ASSESSMENT

4.3.1 Data Quality Objectives and Poor Quality Site Investigations, including Lack of Vertical Delineation and characterisation of Contamination – Schedule B(2)

It is the experience of regulatory agencies that many sites are not being adequately investigated in terms of:

- sufficient field data being collected
- sufficient vertical delineation of contamination
- the adequacy of information to enable decisions on management of contamination to be made.

These gaps may occur because neither the Data Quality Objectives (DQOs) of the investigation nor a conceptual model of the site prepared in the planning of site investigations are properly prepared and considered.

Data Quality Objectives

The Data Quality Objectives (DQO) process is used to define the type, quantity, and quality of data needed to support decisions relating to the environmental condition of a site. It provides a systematic approach for defining the criteria that a data collection design should satisfy, including where, when and how to collect samples or measurements; determination of tolerable decision error rates; and determine the number of samples or measurements that should be collected.

In practice, there are deficiencies in site assessment and reporting related to inadequate application of DQO processes. The *Australian Standard 4482.1-1997: Guide to the sampling and investigation of potentially contaminated soil - non-volatile and semi-volatile compounds* describes the DQO as a seven-step process. It does not provide full details on the application of the DQO process.

Issue 28

Is more guidance required on the application of DQO processes?

Collection of Field Data

The largest gaps are in the collection of field-based information such as:

- soil type and soil properties
- field observations are not detailed
- site specific information about hydrogeological conditions (instead of field measurements, consultants use generic published parameters and assumptions for input into numerical models)
- depth of sample collection (this information is generally obtained for soil samples, but not for groundwater samples where it is important, as stratification of substances may occur in an aquifer).

Gaps in the collection of field data at the investigation stage mean that significant uncertainties are created in the application of numerical models and fate and transport models for contaminants. As a result, risk assessment and management decisions regarding remediation options, are often rendered difficult which may lead to inappropriate decisions.

Schedule B(2) of the NEPM – Guideline on Data Collection, Sample Design and Reporting contains information relating to the presentation of field data in bore logs. It does not consider the minimum requirements for field data collection.

Issue 29

What further guidance should the NEPM provide on the collection of field parameters? For example, would it be useful if the guidance is provided in the form of checklists?

Delineation and Characterisation of Contamination

Section 5.2.6 of Schedule B(2) “Delineating the Plume” refers to lateral and vertical variability in contamination (groundwater) being critical in targeting remediation.

Delineation and characterisation of contamination in all relevant media: soil, sediment and groundwater is important to ensure that:

- the extent of contamination is understood so that appropriate data are used for modelling purposes

- the contamination has been adequately defined and characterised both laterally and vertically.

Issue 30

What guidance should be provided so that vertical and lateral delineation and characterisation of contamination can be satisfactorily achieved?

4.3.2 Groundwater assessment – Schedule B(2) & B(6)

In many sites, adequate assessment of groundwater impacts associated with soil contamination is essential to properly identify potential health and environmental risks.

Schedule B(2) provides technical guidance of a general nature on conducting groundwater investigations involving well establishment, groundwater sampling and plume delineation. Among practitioners in this field, there are differing approaches to groundwater assessment that have led to some concerns, for example with regard to consistency in:

- adequate sampling
- adequate well construction
- adequate characterisation (three-dimensional, particularly vertical, delineation)
- misinterpretation of aquifer characteristics
- cross contamination of aquifers
- fate and transport modelling approaches.

Issue 31

Should further guidance be provided on the technical aspects of groundwater assessment, and if so, what should be the scope and content of this guideline?

4.3.3 Assessment of fuel storage sites – Schedule B(2)

Land with current and former fuel storage uses are the most prevalent sites assessed for contamination. The sites include service stations, fuel depots, fuel tank farms, underground (UST) and above-ground (AST) storage tanks for fleet vehicles or industrial machinery for a wide range of industries and provision of generator fuel.

It is common for fuel storage tanks and associated delivery pipework and bowser stands to leak fuel. In some cases the leaks and associated site contamination issues are minor. In other cases the fuel leaks are substantial and result in large quantities of phase separated hydrocarbon (PSH) in the subsurface and associated groundwater contamination, off site migration with pollution of local public and private land, groundwater resources and environmental and safety risks from infiltration of inground services.

Fuel storage sites with a history of contamination have also been the subject of litigation and compensation claims from affected parties and court proceedings have closely reviewed site assessment processes and their adequacy in reaching judgements in relation to the parties involved. There appear to be divergent assessment practices between consultants, in different States and Territories, and between the site assessment specifications of the major oil companies.

While some jurisdictions have guidelines for service station sites, not all aspects of fuel storage are covered in detail by individual State and Territory guidelines. Given the necessity to assess large numbers of these sites across Australia, it appears to be within the goals of the NEPM to

have a uniform best-practice approach for assessment of these site types. The guidance could be supported by individual jurisdictional guidelines that address local policy issues.

Issue 32

Is it appropriate to develop additional guidance for sites with fuel storage uses, given that generic guidance already exists under the NEPM such as sampling design, data collection, and assessment of groundwater contamination?

Issue 33

Should a guideline specify protocols for the assessment of sites involving fuel storage? For example:

- what standard sampling approaches should be used that will enable proper assessment of current and former tank areas, in ground pipework and bowser areas?
- what should be the linear separation of samples in open pits and at what depths below surface should they be taken?
- how should soil stockpiles be sampled and managed to prevent environmental harm?

5

4.4 LABORATORY METHODS AND TECHNIQUES

4.4.1 Laboratory methods and techniques – Schedule B(3)

Currently, Schedule B(3) of the NEPM provides general guidance on laboratory procedures, and provides specific guidance on which analytical methods should be used for some analytes.

10 In the absence of specific guidance, or where jurisdictions have not specified which analytical procedures to use, the analyst or the site assessor may decide on which method to use. Frequently, the choice of analytical method used for a given parameter can influence the result of that analysis. This, in turn, can influence decision making about site contamination. In some cases, specified analytical methods offer options or alternatives that leave the analyst with a large influence on the result, simply through the choice of method.

15

In some cases, existing analytical procedures only crudely define the parameter being measured and this is especially true for TPH measurement. More modern analytical procedures may be able to reduce the uncertainty and variability arising in such circumstances, and provide more meaningful information from analysis.

20

Issue 34

Should the NEPM specify the use of particular analytical procedures and methods or would it be more appropriate to specify performance objectives and outcomes for analytical procedures? For example:

- for which analytes should the procedures be specified?
- should it be limited to those analytes for which there are not already well accepted, acknowledged standard approaches?
- by what process should the methods be specified?
- what would be appropriate indicators on which to base performance objectives?

Advances in the understanding of the behaviour of contaminants have led to the development and application of concepts such as bioavailability and developments in leachability testing. Such test procedures are still at a developmental stage and there may still be a reliance on research-type procedures to measure them. There may not, necessarily, be a standardised approach to measuring them.

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Issue 35

By what mechanism should new analytical techniques in developing areas be incorporated into site assessment work?

4.4.2 Bioavailability/Leachability – Schedule B(5)

Exposure routes are affected by various factors including the type, fate and transport of substances, soil characteristics and receptor behaviour. One factor that is gaining increased attention is bioavailability. Bioavailability relates to the fraction of the total amount of a chemical that is able to interact with an organism. There is no standardised method recognised in the current NEPM for measuring bioavailable fractions, however there are several research-based techniques (e.g. determination of pore-water concentrations of substances and physiologically-based extraction tests – PBET).

Leachability is the amount of substance in the soil that is mobilised through environmental factors (e.g. rainfall). Leachability is commonly measured by a selection of standardised methods (e.g. USEPA toxic characteristic leaching procedure – TCLP) some of which are specified in the NEPM.

In general, soil guideline values (including HILs in the NEPM) incorporate the conservative assumption that 100% of the substances in the soil are bioavailable. Therefore the actual risks from substances in soil may be overstated with resultant increases in compliance costs

The existing NEPM allows for consideration of bioavailability and leachability in health and ecological risk assessments, but it provides only limited guidance on how to do this.

Issue 36

Should the NEPM provide more guidance on measurement of bioavailability and leachability and incorporation of their considerations into health and ecological risk assessments?

4.5 COMPETENCIES AND COMMUNICATION**4.5.1 Community consultation – Schedule B(8)**

Schedule B(8) of the NEPM provides a framework for consulting the community and communicating risks associated with site contamination. Sometimes members of the community have high levels of anxiety and express concern during site contamination assessments. In some cases, hundreds of public complaints are received by regulators and proponents – particularly with complex and difficult sites. Many complaints associated with site contamination issues could be avoided if the community is consulted and informed of issues relating to the site before any assessment work is undertaken.

Issue 37

Does the current guideline (Schedule B(8)) supply adequate guidance in relation to risk communication, community consultation and participation? If not, what additional, or more detailed, information could be included.

4.5.2 Competency of consultants – Guidelines for Competencies and Acceptance of Contaminated Land Auditors and certifiers – Schedule B(10)

The assessment of contaminated sites is a specialised professional area involving a number of disciplines. Practitioners must have a range of competencies and be able to recognise the need for supporting professional advice beyond their expertise when assessing contamination and its effects on land use and the environment. The extent to which these competencies are applied varies with the complexity of contamination issues on individual sites.

Professional assessments of site contamination deal with health and environmental issues of concern to landowners, occupiers and the public. These assessments are required by regulatory and planning authorities for determination of appropriate management of contaminated land and in development approval processes.

Schedule B(10) of the NEPM, Competencies and Acceptance of Environmental Auditors and Related Professionals, identifies competencies that are essential to assessment of site contamination. It also provides a general framework for acceptance by regulatory authorities of contaminated land auditors and similar professionals who are required to certify site assessments.

However, the NEPM does not provide practical guidance on the competencies, qualifications and relevant experience of contaminated land consultants and practitioners.

Issue 38

Is the current guideline (Schedule B(10)) sufficient to provide an adequate standard of professional overview of site assessment?

What are appropriate methods of measuring and assessing the competencies of contaminated land practitioners?

Consultant competencies

Jurisdictions, accredited auditors and related professionals have raised concerns regarding the standard of site assessment work of some contaminated land consultants as reflected in the quality of site work and the standard of site assessment reports.

The issues raised relate to deficient assessment practices, lack of application of relevant NEPM and jurisdictional guidelines on basic data collection, poor report preparation, limited appreciation of assessment requirements for impacted groundwater and poor understanding of health and environmental risk assessment.

In some cases, consultants may be experienced and competent site assessors but place less emphasis on adequate report preparation. In other cases the demand of workloads may influence consultancies to use less experienced personnel to undertake work on particular sites. Other practitioners may have limited access to the support of a team of specialists in aspects of site contamination.

The impact of poor work standards is often an increase in costs, and time delays, to clients as rework is necessary to ensure that an adequate standard of assessment has been undertaken to address uncertainties. In some cases, standards are demonstrably poor and are the cause of regulatory intervention and costly litigation. Such delays can cause criticism of all stakeholders and impairment of the achievement of the desired environmental outcomes.

Schedule B(10) states that the guideline may be used by landowners, developers and consultants to assist with decision making in the employment or training of professionals for contaminated site assessment work. However, the guideline does not provide specific detail on how this may be achieved.

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Issue 39

To improve site assessment and reporting standards, should the NEPM provide guidance on the engagement of suitably qualified and experienced contaminated land practitioners? For example, is more guidance needed to specify the qualifications, membership of professional bodies and relevant experience of individual professionals other than auditors in contaminated land?

Auditor acceptance

The Victorian and NSW Governments have mature and well-regarded auditor schemes with a significant number of senior professionals appointed to service the local markets. Other States Governments are considering similar schemes, or operate or are considering a graded system under administrative arrangements.

Schedule B(10) also provides general guidance for States or Territory Governments that wish to adopt a graded auditor system. This approach engages competent private sector professionals to undertake limited auditing of either basic site contamination issues in remote areas with lower land values or in urban areas with less former industrial usage and limited contamination types.

These systems seek to utilise contaminated land competency in the private sector when private and public sector environmental services are limited and decentralisation is a major consideration.

Jurisdictions receive occasional criticisms or perceptions of accredited auditor systems regarding the market seeking auditors with the most favourable interpretations of risk; inconsistency in decisions between auditors; auditor conservatism relating to liability concerns; mutually beneficial auditing arrangements between major consultancies and with major customers; and, of insufficient supply of auditors to service market demand. Regulators undertake review and audit of specific assessments and auditor reports and conferences are regularly held by jurisdictions with appointed auditors to resolve issues of concern and improve operational practices.

Issue 40

How can the guideline (Schedule B(10)) become more practical and effective to achieve consistent national professional practice in site contamination assessment and auditing, while considering jurisdictional needs?

4.6 OTHER ISSUES

It is recognised that the issues raised in this paper may not be the only issues of concern during the review of this NEPM and the effectiveness of its implementation. **Submitters are encouraged to identify any other issues of concern or where further advice or guidance is required.**

Issue 41

Are there any other issues that should be considered in the review of this NEPM?

ACRONYMS

ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
AST	Above-ground Storage Tank
AWQG	Australian Water Quality Guidelines
DQO	Data Quality Objectives
EILs	Ecological Investigation Levels
EPHC	Environment Protection and Heritage Council
GILs	Groundwater Investigation Levels
HILs	Health-based Investigation Levels
NDP	National Dioxins Program
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
PBET	Physiologically-based extraction tests
SSD	Species Sensitivity Distribution
TCLP	Toxic characteristic leaching procedure
TPH	Total Petroleum Hydrocarbon
TRH	Total Recoverable Hydrocarbon
US EPA	United States Environment Protection Authority
UST	Underground Storage Tank

**APPENDIX 1 –
NEPC REPORT ON THE IMPLEMENTATION OF THE
ASSESSMENT OF SITE CONTAMINATION
FOR THE REPORTING YEAR ENDED 30 JUNE 2004**

PART 1 – GENERAL INFORMATION

NEPM details

Title: National Environment Protection (Assessment of Site Contamination) Measure

Made by Council: 10 December 1999

Commencement Date: 22 December 1999 (advertised in *Commonwealth of Australia Gazette* no GN 51, 22 December 1999, p 4246)

NEPM goal (or purpose)

The goal of the National Environment Protection (Assessment of Site Contamination) Measure is set out in clause 5 (1) of the Measure as follows:

- 5 (1) National environment protection goal
The purpose of the Measure is to establish a nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community which includes regulators, site assessors, environmental auditors, landowners, developers and industry

Desired environmental outcomes

The desired environmental outcome of the National Environment Protection (Assessment of Site Contamination) Measure is set out in clause 5 (2) of the Measure as follows:

- 5 (2) Desired environmental outcome
The desired environmental outcome for this Measure is to provide adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and effective national approach to the assessment of site contamination.

Evaluation criteria

The assessment of the effectiveness of the National Environment Protection (Assessment of Site Contamination) Measure is based on the following criteria.

General criteria (specified in the NEPC Implementation Reporting Protocol)

- progress in implementing the NEPM
- compliance by parties bound by the NEPM with NEPM protocols and/or other NEPM reporting requirements
- progress toward achievement of the NEPM goal, the desired environmental outcomes and any NEPM standards
- issues arising that reflect on the efficiency and simplicity of NEPM administration.

Specific criteria

- No specific criteria are set out in the NEPM.

PART 2 – IMPLEMENTATION OF THE NEPM AND ANY SIGNIFICANT ISSUES

This part provides a summary of jurisdictional reports on implementation, discussion of any issues of concern raised by jurisdictions, and Council's overall assessment of the implementation of the NEPM.

Legislative, regulatory and administrative framework

Table 1: Summary of implementation frameworks

Jurisdiction	Summary of implementation frameworks
Commonwealth	<ul style="list-style-type: none"> The Commonwealth is implementing the NEPM through administrative arrangements.
New South Wales	<ul style="list-style-type: none"> The NEPM operates under guidelines issued under s. 105 of the <i>Contaminated Land Management Act 1997</i>.
Victoria	<ul style="list-style-type: none"> The Environmental Audit System (Contaminated Land) provides the administrative framework for the assessment of site contamination. The key legislative instruments to administer the NEPM are: the State environment protection policy (Prevention and Management of Contamination of Land), the State environment protection policy (Groundwaters of Victoria), the Industrial waste management policy (Prescribed Industrial Waste) and the <i>Planning and Environment Act 1987</i>.
Queensland	<ul style="list-style-type: none"> The NEPM is applied through the <i>Environmental Protection Act 1994</i> and <i>Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998</i>. All site investigations and reporting must comply with the NEPM requirements when statutory decisions are sought from the EPA. The EPA also uses contaminated land triggers in the <i>Integrated Planning Act 1997</i>.
Western Australia	<ul style="list-style-type: none"> Western Australia is awaiting proclamation of the <i>Contaminated Sites Act 2003</i>, which has been drafted in accordance with the principles of the NEPM.
South Australia	<ul style="list-style-type: none"> The EPA is currently drafting amendments to the <i>Environment Protection Act 1993</i> to address site contamination. The principles of the NEPM are also being introduced, where appropriate, into licence conditions.
Tasmania	<ul style="list-style-type: none"> Under s. 12A of the <i>State Policies and Projects Act 1993</i>, the NEPM became State Policy.
Australian Capital Territory	<ul style="list-style-type: none"> The provisions of the NEPM were enacted through amendments to the <i>Environment Protection Act 1997</i>.
Northern Territory	<ul style="list-style-type: none"> The assessment and management of contaminated land is undertaken through the auditing and pollution control provisions of the <i>Waste Management and Pollution Control Act 1998</i> and may also be directed pursuant to the provisions of the <i>Planning Act 1999</i>.

Council assessment of implementation frameworks

Jurisdictions are continuing to incorporate the NEPM into relevant regulatory and administrative frameworks.

Implementation activities

Table 2: Summary of implementation activities

Jurisdiction	Summary of implementation activities
Commonwealth	<ul style="list-style-type: none">• Relevant Commonwealth agencies have implemented the NEPM by incorporating the requirements in their environmental management systems or hazardous management manuals.
New South Wales	<ul style="list-style-type: none">• NSW EPA finalised 35 significant risk of harm assessments under section 9 of the Contaminated Land Management Act.• Accredited site auditors have issued 156 statutory and 113 non-statutory site audit statements.
Victoria	<ul style="list-style-type: none">• Environmental auditors are briefed regularly by EPA Victoria.• Guidelines have been published which require auditors to refer to the NEPM as a key reference document.• 143 contaminated sites audits were completed.
Queensland	<ul style="list-style-type: none">• 170 development applications were required to be assessed in accordance with the NEPM.• Strategies have been developed for compulsory NEPM use under environmental planning legislation, for use of third-party review and for regulatory action for non-compliance.• Workshops and presentations were held for environmental auditors.
Western Australia	<ul style="list-style-type: none">• The Department of Environment employs a series of technical guidelines to refine further the protocols established under the NEPM.
South Australia	<ul style="list-style-type: none">• The EPA is continuing to promote the NEPM to government departments, industry, the community and environmental auditors and consultants.
Tasmania	<ul style="list-style-type: none">• The NEPM has been adopted by the Department of Primary Industries, Water and Environment as a set of guidelines that should be complied with when conducting site contamination assessments.• Some local councils have revised the structure and content of their planning schemes in response to the NEPM. Discussions continue with the remaining councils.
Australian Capital Territory	<ul style="list-style-type: none">• The NEPM is used as the primary reference tool when assessing contaminated sites.• Environment ACT continues to promote the NEPM to government departments, industry and the community.

Jurisdiction	Summary of implementation activities
Northern Territory	<ul style="list-style-type: none"> • Preparation of a draft Environment Protection Objective (EPO) has progressed. The EPO will require site assessments to be conducted in accordance with the NEPM. It is anticipated that the EPO will be in place in the next reporting period. • The NEPM principles continue to be implemented under the provisions of the <i>Waste Management Pollution Control Act 1998</i>.

Council evaluation and assessment of jurisdictional implementation activities

The establishment of the NEPM as a nationally consistent approach to the assessment of site contamination has provided a common basis for interactions between agencies in jurisdictions across Australia. Reporting on the application of the NEPM is not uniform as the NEPM comprises guidelines only and, consequently, differences in legislative frameworks occur across the jurisdictions.

The NEPM has been recognised by environmental auditors, consultants, developers and others in the site assessment industry as a comprehensive source of guidance. Jurisdictions continue to work with these groups to ensure consistency in application of the NEPM.

PART 3 – ASSESSMENT OF NEPM EFFECTIVENESS

The NEPM continues to be a valuable resource tool for the assessment of site contamination. The acceptance and implementation of the NEPM has been highly beneficial, as it has led to increased consistency between jurisdictions. The NEPM is the premier guidance document for the assessment of site contamination in Australia.

Further guidance on the assessment of hydrocarbon-affected sites would be valuable and would increase the usefulness of the NEPM as well as progress the achievement of the NEPM's goals and outcomes.

Implementation of the NEPM appears to favour the assessment of health risk, rather than ecological risk, primarily because of the availability of health-related data. This presents one possible area of attention for the review of the NEPM.

PART 4 – REPORTING REQUIRED BY THE NEPM

The reporting requirements in the NEPM state that each participating jurisdiction should:

- submit a report on the assessment of the implementation and effectiveness of the Measure, including compliance with the Measure, under Section 23 of the Commonwealth Act and similar provisions in the corresponding Acts of each participating State or Territory.

Such information is contained in Parts 2 and 3 of this report.

PART 5 – REPORTING ON IMPLEMENTATION BY JURISDICTIONS

The Annexes to this report are in Appendix 6:

- Annex 1: Commonwealth
- Annex 2: New South Wales
- Annex 3: Victoria
- Annex 4: Queensland
- Annex 5: Western Australia
- Annex 6: South Australia
- Annex 7: Tasmania
- Annex 8: Australian Capital Territory
- Annex 9: Northern Territory.