Department of
Environment and Conservation

Contaminated Sites Management Series

REPORTING OF KNOWN OR SUSPECTED CONTAMINATED SITES

November 2006

PREFACE

The Department of Environment and Conservation (DEC)[1] has prepared the *Reporting of Known or Suspected Contaminated Sites* guideline to provide guidance to people with an obligation or desire to report known or suspected contaminated sites to DEC in accordance with the *Contaminated Sites Act 2003* (including site owners and occupiers, government authorities, industry and other affected parties). The guideline contents provide DEC's interpretation of when and how sites should be reported under the provisions of the Act.

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LIMITATIONS

The guideline may be relevant to people who are owners or occupiers, causers of contamination and auditors who are required to report a known or suspected contaminated site to DEC under the *Contaminated Sites Act 2003*, and any other person who wishes to report such a site to DEC under the *Contaminated Sites Act 2003*. The contents provide DEC's policy interpretation of the requirements for reporting of known or suspected sites under the *Contaminated Sites Act 2003*. Competent people should be engaged to provide specific advice in relation to the assessment and management of contaminated sites.

The guideline should be used in conjunction with the texts referred to in the guideline and any other appropriate references.

DISCLAIMER

The information presented in this document is provided voluntarily as a public service. The information provided is made available in good faith and is believed accurate at the time of publication. However, the document is intended to be a guide only and should not be seen as a substitute for obtaining appropriate advice or making prudent enquiries. The information is provided solely on the basis that readers will be responsible for making their own assessment of the matters discussed therein and that they should verify all relevant representations, statements and information. Changes in legislation, or other circumstances, after the document has been published may impact on the accuracy of any information or advice contained in the document and readers should not rely on the accuracy of information presented in this document.

[1] Previously Department of Environment (DoE), and before that, Department of Environmental Protection (DEP)

Information presented in this document does not constitute, and is not intended to be used as legal advice nor used as an interpretive instrument. In the event of any inconsistency between this document and relevant legislation, provisions of the relevant legislation will prevail.

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Contaminated Sites Management Series

The guideline is part of a management series developed by DEC to assist in the identification, assessment and management of contaminated sites in Western Australia. The management series guidelines encourage consistent and accurate reporting by informing consultants, industry and landowners of the information required by DEC to enable appropriate management of contaminated land and groundwater in WA.

The Contaminated Sites Management Series comprises the following guidelines:

- Assessment Levels for Soil, Sediment and Water
- Bioremediation of Hydrocarbon Contaminated Soils in Western Australia
- Certificate of Contamination Audit Scheme
- Community Consultation
- Contaminated Sites and the Landuse Planning Process
- Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting
- Development of Sampling and Analysis Programs
- Disclosure Statements
- Potentially Contaminating Activities, Industries, and Landuses
- Reporting of Known or Suspected Contaminated Sites
- Reporting on Site Assessments
- Site Classification Scheme
- The Use of Risk Assessment in Contaminated Site Assessment and Management: Guidance on the Overall Approach, and
- Use of Monitored Natural Attenuation for Groundwater Remediation.

Using these guidelines will help you meet DEC's minimum requirements.

Copies of the guidelines are available from DEC's library at The Atrium, 4th Floor, 168 St Georges Terrace, Perth, or from www.dec.wa.gov.au/contaminatedsites.

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1. Background

One of the central elements of the *Contaminated Sites Act 2003* (CS Act) is the requirement for reporting of known or suspected contaminated sites to the Department of Environment and Conservation (DEC) to allow for:

- a comprehensive register of sites to be held and
- the transfer of information on the location and nature and extent of contamination of these sites to the public.

DEC Fact Sheet 1 "*How to access information on contaminated sites in Western Australia*" explains how to obtain information on contaminated sites in WA.

The CS Act (section 4) provides the following definition of "contaminated":

> " *In relation to land, water or a site, means having a substance present in or on that land, water or a site at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value.* "

The CS Act only applies to sites when substances are present in the environment (i.e. in soil, sediment, surface water or groundwater) above background concentrations, and at concentrations high enough to pose a risk (an adverse impact) or have the potential to pose a risk to human health, the environment or any environmental value. Generally this is because of human involvement, such as a spill or leak of a chemical from a tank/pipeline due to poor site management, or the inappropriate disposal of wastes.

The CS Act does not contain provisions relating to prevention of spills or leaks or inappropriate waste disposal, nor for offences relating to these activities, because such provisions are contained within the *Environmental Protection Act 1986*. If activities undertaken on a site do not result in the release of contaminating substances into soil, sediment, surface water or groundwater at levels which pose or potentially pose risks to human health, the environment or any environmental value, then the CS Act does not apply.

In relation to human health, risks are generally posed because of exposure to substances, via direct exposure to the skin (from contact with contaminated soil, sediment or water), inhalation (of volatile substances, contaminated dusts or fibres) or ingestion (of contaminated soil or water).

Examples of risks to the environment may include detrimental health impacts or death of terrestrial or aquatic flora and fauna, resulting from the uptake or ingestion of contaminants from soil, sediment, surface water or groundwater, or via direct contact with the contaminants.

2. Introduction

This document provides DEC's policy interpretation of the requirements for reporting of known or suspected contaminated sites under the CS Act.

Any person may report a known or suspected contaminated site to DEC, but under the CS Act (section 11(4)) the following persons have a duty to report such sites to DEC:

- an owner or occupier of the site
- a person who knows, or suspects, that he or she has caused, or contributed to, the contamination
- a contaminated sites auditor (accredited under the CS Act) engaged to provide a report that is required for the purposes of the Act, in respect of the site.

Once reported, sites will be classified by DEC, in consultation with the Department of Health (DoH), as one of the seven classifications listed in Schedule 1 of the CS Act, based upon the risk they pose to human health and the environment. The classification assigned to a site will determine whether:

(i) further investigation or remediation is required;

(ii) the site is listed on the publicly available database of confirmed contaminated sites[2]; and

(iii) a memorial is registered on the land title[3].

The classification of a site can change over time. As new information becomes available (such as the results of a detailed site investigation or validation results following completion of remediation at a site), the information can be submitted to DEC, and the site may be reclassified to reflect its latest contamination status. Further information on the site classification process can be obtained from DEC's *Site Classification Scheme* (2006) guideline.

Figure 1 describes the process of site identification, reporting and management of known or suspected contaminated sites.

[2] Sites classified as *contaminated – remediation required, contaminated – restricted use* or *remediated for restricted use* will be listed on the public contaminated sites database.

[3] Sites classified as *contaminated – remediation required, contaminated – restricted use, remediated for restricted use* or *possibly contaminated – investigation required* will have a memorial registered on the land title.

3. Reporting of contaminated sites

Reporting of Contaminated Sites - Summary

- *Under section 11 of the CS Act, any person who knows or suspects a site is contaminated may report it to DEC.*
- *Section 11(4) of the CS Act places a duty on certain parties to report known or suspected contaminated sites to DEC.*
- *Known contaminated sites must be reported to DEC within 21 days after the day the site was first known to be contaminated.*
- *Suspected contaminated sites must be reported as soon as reasonably practicable.*
- *Reports must be in writing, in the prescribed form (Form 1 in Schedule 1 of the* Contaminated Sites Regulations 2006*).*
- *Sites are to be reported based on their land title/reserve details; sites may comprise more than one parcel of land, and one parcel of land may contain a number of areas of contamination.*
- *Source sites and all affected sites must to be reported.*
- *If contamination at a site has already been reported to DEC, it does not need to be reported again.*
- *Sites should only be reported where there is either knowledge or suspicion of soil, sediment, surface water or groundwater contamination (e.g. through leaks/spills), and not only because an activity which may cause contamination exists at the site.*

3.1 Who must report known or suspected contaminated sites?

Under section 11 of the CS Act, any person who knows or suspects a site to be contaminated may report that site to DEC. However, section 11(4) places a duty upon the following people who know or suspect that a site is contaminated to report that site to DEC:

- an owner or occupier of the site
- a person who knows, or suspects, that he or she has caused, or contributed to, the contamination
- a contaminated sites auditor (accredited under section 69 of the CS Act) engaged to provide a report that is required for the purposes of the CS Act in respect of the site (e.g. when reporting on compliance with a regulatory notice in accordance with section 44 of the CS Act, or when a mandatory auditor's report is required under the Regulations).

3.2 When must a report be made?

A person with a duty to report a site must report the site to DEC within 21 days after the day on which the person first knew (refer to section 3.5.3 of this document) that the site was contaminated (under section 11(3)(a) of the CS Act). The only exception to this is where that person has been granted an extension to the 21-day time period by DEC, in writing, before the expiry of the 21-day period. Applications for extension should be made in writing to the Chief Executive Officer (CEO) of DEC and state the reasons why, and for how long an extension to the 21-day period is required.

A person with a duty to report a site who suspects (refer to section 3.5.4 of this document) that a site is contaminated must report that site as soon as it is reasonably practicable to do so (section 11(3)(b) of the CS Act).

If a person with a duty to report a site (under section 11(4) of the CS Act) has reasonable grounds to believe that the site has already been reported to DEC, and can demonstrate that they believed this to be the case, then they will have a defence to a charge of an offence of failing to report (section 11(5) of the CS Act). DEC has interpreted this to mean that where specific advice on contamination issues has been sought from the Contaminated Sites/Land and Water Quality Branch of DEC[4] in relation to a planning condition or similar statutory requirement, or where contamination issues at a site have voluntarily been reported and correspondence entered into with the Contaminated Sites/Land and Water Quality Branch of DEC, prior to the commencement of the CS Act, the site would not need to be reported again. Other circumstances in which a person with a duty to report a site may have reasonable grounds to believe that the site has already been reported to DEC include where a number of people (e.g. the owner and occupier of the site and causer of the contamination) agree that one of them will report the site on behalf of all of them. If anyone with a duty to report a site has any doubt as to whether the site has already been reported, however, DEC recommends that the person involved reports the site themselves.

3.3 Is there a "period of grace"?

Section 11(6) of the CS Act provides for a six-month "period of grace" for reporting of known or suspected sites from the date on which the Act commences (i.e. 1 December 2006). The intent of this provision is to provide people with a duty to report sites a reasonable period in which to report those sites they already know or suspect to be contaminated when the CS Act commences. At the expiry of the first six months after the Act commences (i.e. 31 May 2007), the timeframes for reporting specified in section 11(3) of the CS Act, and associated penalties for failing to report within those timeframes, will apply (refer to section 3.2 of this document).

3.4 Program for reporting sites

Section 12 of the CS Act provides that the CEO of DEC may approve a program with more time for the identification and reporting of sites to DEC. This may be necessary because of:

[4] Previously the Department of Environment (DoE) and, before that, the Department of Environmental Protection (DEP)

- the large number of sites which the same person/organisation is required to report
- the complexity of adequately identifying sites, or
- the location and extent of sites.

In determining whether to approve a program for reporting sites, or the inclusion of particular sites in a program for reporting sites, the CEO of DEC will consider whether there is enough information available to complete the prescribed form for reporting sites (Form 1 in Schedule 1 of the *Contaminated Sites Regulations 2006* – see section 3.6 of this document). Where there is enough information to complete a Form 1 report within the six-month period of grace for a site or sites, the CEO of DEC is unlikely to approve the proposed program for reporting sites, or the inclusion of the particular site or sites in the proposed program... DEC has taken the policy position that, in accordance with the intent of the CS Act for all known or suspected contaminated sites in WA to be identified as soon as possible, all sites for which there is enough information to complete a Form 1 report within the six-month period of grace (i.e. before 31 May 2007) should be reported via Form 1 reports, rather than a program for reporting.

Where a program for reporting is to be provided, it must be submitted to the CEO of DEC (in writing) for approval within six months of commencement of the CS Act (i.e. before 31 May 2007).

The program for reporting sites must specify:

- the sites or types of sites to be identified and reported under the program
- the methods to be used to identify the sites to be reported under the program
- the timetable proposed for the identification and reporting of sites under the program
- the time within which the program is to be completed
- the reasons why it is considered necessary or desirable for the sites to be identified and reported under section 12.

Where sites are reported under an approved program, the timeframes for reporting specified in the program will apply, rather then those specified in section 11(3) of the CS Act.

3.5 Which sites should be reported?

Based upon the provisions of the CS Act, DEC has interpreted the reporting provisions relating to known or suspected contaminated sites as described in the following paragraphs. However, the reporting of sites under the CS Act is an independent decision by the people referred to in section 3.1 of this guideline, taking into account the individual's, or corporation's, knowledge of the site and the provisions of the CS Act. When evaluating whether a site should be reported to DEC under the CS Act, a person may wish to take the following examples into consideration. The decision to report a site should not be based solely on the generalised guidance provided in this document.

The activities undertaken at a site, currently and historically, may indicate the possibility of contamination. For example, where activities involve the storage and handling of chemicals there is an increased risk of contamination having occurred.

Contamination may be caused by:

- point sources such as accidental spillage of chemicals, leakage of chemicals from drums, tanks, pipe-work and drains; or
- diffuse sources such as leaching of contaminants from inappropriate landfills, regional contamination of groundwater by pesticide and fertiliser application.

Guidance on potentially contaminating activities is provided in DEC's guideline *Potentially Contaminating Activities, Industries and Landuses* (2004). Where an activity on the list in that guideline has been undertaken at a site, the site is not necessarily contaminated, or even necessarily suspected of being contaminated. In the majority of cases, contamination occurs through a lack of appropriate management of activities undertaken at a site, not just because the activity exists or existed. Hence, when deciding whether to report a site to DEC under the CS Act, the person making the report needs to consider whether he/she has knowledge of contamination, or has reasonable grounds to **suspect** contamination of the site.

3.5.1 Source sites and affected sites

The *Contaminated Sites Act Amendment Act 2005* introduced the concepts and definitions for "*source sites*" and "*affected sites*" into the CS Act.

Source sites are those sites:

(a) on which contamination; or

(b) on which a substance, has originated and from which it has migrated to another site (the "affected site") causing, or contributing to, contamination on that other site.

Affected sites are those sites:

On which contamination is caused, or contributed to –

(a) by contamination; or

(b) by a substance, which has migrated to that site from another site (the "source site").

All known and suspected source and affected sites are required to be reported under section 11 of the CS Act.

3.5.2 Exemptions

The *Contaminated Sites Regulations 2006* contain exemptions from the definition of "contaminated" in the CS Act. As listed in regulation 5, these exemptions are:

- surface water that is affected by eutrophication is not contaminated only because of the eutrophication
- land, water or a site is not contaminated where the only substance that is present in or on that land, water or site at above background concentrations that presents, or has the

potential to present a risk of harm to human health, the environment or any environmental value is:

- part of a building or other structure
- wholly contained within a building
- sewage, effluent or liquid waste that is or has been treated by a properly-operated domestic septic tank
- total soluble salts, present in a diffuse manner, as a result of salinisation (natural and as a result of practices such as agricultural irrigation and land clearing)
- an explosive substance contained within an unexploded ordnance
- a substance that is present as a direct result of the correct application of a fertiliser, herbicide or pesticide to land, provided that the use to which the land is put has not changed since the fertiliser, herbicide or pesticide was applied ("correct application" is defined in the *Contaminated Sites Regulations 2006*).

3.5.3 Known contaminated sites

In evaluating the requirement for reporting, DEC has interpreted the requirement in the CS Act to report sites which "the person knows is contaminated…" as referring to sites at which it is known that contamination poses, or has the potential to pose, a risk of harm to human health, the environment or any environmental value.

DEC's policy position is that a site is known to be contaminated only where the site has a contamination *source*, a *pathway* of exposure and the presence of a *receptor* that is, or is likely to, experience harm from the presence of the contaminating substance(s).

The knowledge of impacted soil, sediment or water at a site (resulting from leakage/spillage - *source*) containing substances at concentrations above documented assessment levels[5], and where an exposure *pathway* and *receptor* are identified as being present, would constitute a **known** contaminated site for the purposes of reporting under the CS Act.

DEC considers the following example to be a situation where a person may know, or have evidence to know, that a site is contaminated. A person listed in section 3.1 of this document would therefore be under an obligation to report the site to DEC under section 11 of the CS Act as a known contaminated site:

- Solvent leaking from an underground storage tank is impacting groundwater which is then discharging into a nearby creek. The discharge to the creek is causing a risk, (as determined by an ecological and human health risk assessment) to the ecology of the creek and to any person who may use the creek for recreation or as a drinking water source. This example has the three elements of *source* (leaking solvent storage tank), *pathway* (groundwater) and *receptor* (creek ecosystem or person exposed to creek water) represented, and the linkage is unbroken.

[5] Such as those listed in the DEC document *Assessment Levels for Soil, Sediment and Water* (2003)

Information relating to the assessment of risk, including the various levels of risk assessment, is provided in DEC's guideline *The Use of Risk Assessment in Contaminated Site Assessment and Management: Guidance on the Overall Approach* (2006).

Further scenarios which DEC considers would constitute known contaminated sites and would therefore require reporting to DEC under the CS Act, are provided in Appendix A. Please note that the examples provided are not, and are not intended to be, an exhaustive list of situations in which a site will need to be reported, but may guide people making decisions.

3.5.4 Suspected contaminated sites

DEC has interpreted the CS Act requirements for the reporting of suspected contaminated sites as follows: in DEC's opinion, a person could reasonably suspect that a site is contaminated where site evidence leads to a conclusion that the site has the potential to pose a risk to human health, the environment or any environmental value. In the opinion of DEC, a site should not be seen as "suspected contaminated" merely because it is, or has historically been, used for a potentially contaminating land use or activity[6]. The types of indicators which could lead a person to suspect contamination include:

- known leakage from a storage tank or similar structure has occurred over time
- chemicals or wastes are present on the ground surface or encountered in soil during site works (for example abnormal colouring or staining of the soil, chemical odours)
- a particularly toxic contaminant is/was present at the site, which is likely to cause harm to anything with which it has contact, even in small quantities and with limited exposure, and there is evidence of even a small spill or leak
- samples collected from soil or groundwater at a site have found contaminating substances present at concentrations above documented assessment levels[7], but the extent of impact and the existence of human or ecological receptors have not yet been determined
- inappropriate waste disposal (i.e. via soak well or on-site burial) has occurred.

These sites may be suspected of being contaminated, and following reporting to DEC further investigation would probably be required to determine whether substances are present at concentrations which may pose a risk to the environment or human health.

Sites where a spillage or other pollution incident occurs should be cleaned up immediately to ensure that they do not become contaminated sites. These sites should only be reported where residual impact remains after the initial cleanup and where the impacted area may be considered as a suspected or known contaminated site.

Further possible scenarios of sites which DEC considers would constitute "suspected contaminated sites" and would therefore require reporting to DEC under the CS Act, are provided in Appendix A. The examples provided are not, and are not intended to be, an

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6 DEC's guideline *Potentially Contaminating Activities, Industries and Landuses* (2004) lists activities, industries and land uses which have an increased potential to cause contamination, and the main contaminants which may result from these activities.

7 Such as those listed in DEC's document *Assessment Levels for Soil, Sediment and Water* (2003).

exhaustive list of situations in which a site will need to be reported, but may guide people making decisions.

3.5.5 Sites holding an Environmental Protection Licence under Part V of the *Environmental Protection Act 1986*

Where sites hold an Environmental Protection Licence under Part V of the *Environmental Protection Act 1986*, there is still an obligation to report any known or suspected contamination under the provisions of the CS Act. Where further investigation or management of contamination is required, as far as possible this will be regulated via the Environmental Protection Licence through the addition of conditions relating to the management of the contamination.

3.6 How must a site be reported?

Section 11(2) of the CS Act requires that reports are to be in the "prescribed form", that is Form 1 in Schedule 1 of the *Contaminated Sites Regulations 2006.* All reports must be in writing using Form 1, which is available from www.dec.wa.gov.au/contaminatedsites. These reports should be sent (by post or facsimile) to the CEO of DEC.

Sites should be reported according to their land title/reserve details. A site may comprise more than one parcel of land. For example, a fuel leak from a service station may have resulted in groundwater contamination which has migrated beyond the boundaries of the service station site and beneath adjacent properties. In this instance a single Form 1 would be required for the site and should list all the parcels of land known or suspected of being contaminated as a result of the fuel leak.

For other sites, one parcel of land, as defined by a single title or reserve number, may contain a number of different areas of contamination. An example is a mine site where there may be different areas of contamination, such as the fuel storage area or tailings storage facility. In this instance, a single Form 1 should be submitted for the title/reserve number detailing all of the individual areas of known or suspected contamination. Information on how these individual areas of contamination are to be managed may be attached to Form 1.

3.7 What information is required to be reported?

All reports of known or suspected contaminated sites under section 11 of the CS Act must be made in writing using Form 1 in Schedule 1 of the *Contaminated Sites Regulations 2006*.

Form 1 requires:

- the details of the person reporting the site
- their relationship to the site
- the location of the site, and
- a description of the reasons why the person making the report either knows or suspects that the site is contaminated.

Where technical reports relating to any investigation, monitoring or remediation of a site or similar are available, these reports should be submitted to DEC with Form 1 to assist classification of the site. For technical reports accompanying the initial Form 1 report submitted for a site, an auditor's report is not required to accompany the technical reports.

Following initial classification of a site by DEC, where further investigation, remediation or monitoring is required at the site which will include preparation of technical reports, the further works and reports may need to be audited by a contaminated sites auditor, where required under the CS Act or Regulations, and be accompanied by a report from the auditor when they are submitted to DEC for assessment and reclassification of the site.

Where reports are incomplete (i.e. the mandatory information required on Form 1 has not been provided), DEC will not treat the report as a valid report for the purposes of the CS Act. DEC may, however, invite the person who made the report to submit the additional information. Where a report does not provide sufficient grounds to indicate possible contamination of a site, DEC is likely to classify the site *report not substantiated*, and no further action will be taken by DEC to require investigation or management unless additional information regarding contamination or suspected contamination at the site is provided.

Where sites are being reported under an approved program for reporting under section 12 of the CS Act, the report for each site must include the same basic information as required for a Form 1 report (i.e. the details of the person reporting the site, their relationship to the site, the location of the site and a description of the reasons why the person making the report either knows or suspects that the site is contaminated). Where technical reports relating to any investigation, monitoring or remediation of a site are available, these reports should also be submitted to DEC to assist classification of the site.

3.8 Failure to report

Where it is mandatory to report under the CS Act, failure to do so constitutes an offence. If convicted, the CS Act provides for a maximum penalty of $250,000 and a daily penalty of up to $50,000 for individuals. The maximum penalties for bodies corporate are five times these amounts (*Sentencing Act 1995*).

3.9 Malicious reporting of sites

Under section 11(9) of the CS Act, it is an offence to report sites maliciously and without reasonable grounds to believe or suspect that the site is contaminated. If convicted, the CS Act provides for a maximum penalty of $250,000 for individuals. The maximum penalty for bodies corporate is five times this amount (*Sentencing Act 1995*).

3.10 Provision of false or misleading information

Under section 94 of the CS Act, it is an offence to provide false or misleading information or to fail to disclose materially relevant information when reporting a known or suspected contaminated site under section 11 or 12 of the CS Act. . If convicted, the CS Act provides

for a maximum penalty of $125,000 and a daily penalty of up to $25,000 for individuals. The maximum penalties for bodies corporate are five times these amounts (*Sentencing Act 1995*).

4. Glossary

Accredited auditor

Person accredited as a contaminated sites auditor under the provisions of Part 7 of the CS Act. The role of auditor is to provide an independent review of investigation and clean-up works completed at a site.

Assessment

Study of a site to determine possible and actual contaminants. May involve a desktop review of the site and may also include the collection of soil, groundwater or sediment samples.

Assessment levels

Guideline concentrations of analytes adopted by DEC to indicate the potential presence of contamination and to trigger requirements for further investigation and assessment of risk at a site.

Background concentration

Naturally occurring, ambient concentrations of substances in the local area of a site. The soil and water quality in the immediate area of a site may be affected by man-made factors, in which case, the background soil and/or water quality should be determined from a comparable geological/hydrogeological setting, which is minimally affected by anthropogenic activities.

Beneficial use

The use of the environment, or of any portion thereof, which is:

(a) conducive to public benefit, public amenity, public safety, public health or aesthetic enjoyment and which requires protection from the effects of emissions or of activities referred to in paragraph (a) or b) of the definition of "environmental harm" in section 3A(2) of the *Environmental Protection Act 1986*; or

(b) identified and declared under section 35(2) of the *Environmental Protection Act 1986* to be a beneficial use to be protected under an approved policy.

Contaminated	In relation to land, water or a site, means having a substance present in or on that land, water or site at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value.
CS Act	*Contaminated Sites Act 2003*
DEC (also DoE and DEP)	Department of Environment and Conservation , previously Department of Environment (DoE) and before that Department of Environmental Protection (DEP).
Detailed site investigation	An investigation which confirms and delineates potential or actual contamination through a comprehensive sampling and analysis program and risk assessment.
Diffuse source	Geographically widespread area of contamination, such as agricultural areas or large industrial complexes, which contains numerous point sources.
DoH	Department of Health
Ecosystem	Unit including a community of organisms, the physical and chemical environment of that community, and all the interactions between those organisms and between the organisms and their environment.
Ecosystem health condition	A condition of the ecosystem which is (a) Relevant to the maintenance of ecological structure, ecological function or ecological process and which requires protection from the effects of emissions or activities (as referred to in (a) and (b) of the definition of environmental harm); or (b) Identified and declared under section 35(2) of the *Environmental Protection Act 1986* to be an ecosystem health condition to be protected under an approved policy.

Environment	Living things and their physical, biological and social surroundings and interactions of all these things.
Environmental harm	Direct or indirect – (a) harm to the environment involving removal or destruction of, or damage to – (i) native vegetation; or (ii) the habitat of native vegetation or indigenous aquatic or terrestrial animals; (b) alteration of the environment to its detriment or degradation or potential detriment or degradation; (c) alteration of the environment to the detriment or potential detriment of an environmental value; or *(d)* alteration of the environment of a prescribed kind as specified in the *Environmental Protection Act 1986.*
Environmental value	(a) beneficial use; or (b) an ecosystem health condition.
Exposure	Contact of a chemical, physical or biological agent with the outer boundary of an organism e.g. inhalation, ingestion or dermal contact.
Pathway (exposure pathway)	The course a chemical or physical agent takes from a source to a receptor. An exposure pathway describes a unique mechanism by which an individual or population is exposed to chemicals or physical agents at a site or originating from a site. Each exposure pathway includes a source or release from a source, an exposure point and an exposure route.
Point source	Localised source of contamination such as leaking storage tanks and drums.

Preliminary site investigation	An investigation consisting of a desktop study, a detailed site inspection and, where appropriate, limited sampling. The scope of a preliminary site investigation should be as necessary to determine whether contamination is present or likely to be present and to determine whether a detailed site investigation is required.
Receptor	An entity, such as a person, animal, ecosystem or structure, which may be adversely affected by exposure to a contaminant.
Remediation	In general, action taken to eliminate, limit, correct, counteract, mitigate or remove any contaminant or the negative effects of the contaminant on the environment or human health. With respect to the CS Act and a site that is contaminated, remediation includes: (a) the attempted restoration of the site to the state it was in before the contamination occurred; (b) the restriction, or prohibition, of access to, or use of, the site; (c) the removal, destruction, reduction, containment or dispersal of the substance causing the contamination, or the reduction or mitigation of the effect of the substance; (d) the protection of human health, the environmental or any environmental value from the contamination.
Risk	The probability in a certain timeframe that an adverse outcome will occur in a population and/or ecosystem of a specified area that is exposed to a particular dose or concentration of a hazardous agent, i.e. it depends on both the level of toxicity of the hazardous agent and the level of exposure.
Risk assessment	Process of estimating the potential impact of a chemical, biological or physical agent on a specified human population or ecological system under specified conditions and timeframe.

Site	An area of land, including underground water under that land and surface water on that land.
Source	Source of contamination (e.g. spill, leakage from a tank).

5. References

Contaminated Sites Act 2003

Contaminated Sites Regulations 2006

Department of Environment* (2003) *Assessment Levels for Soil Sediment and Water* (draft) Contaminated Sites Management Series

Department of Environment* (2004) *Potentially Contaminated Activities, Industries and Landuses* Contaminated Sites Management Series

Department of Environment and Conservation (2006) *The Use of Risk Assessment in Contaminated Site Assessment and Management: Guidance on the Overall Approach* Contaminated Sites Management Series

Department of Environment and Conservation (2006) *Site Classification Scheme* Contaminated Sites Management Series

Environmental Protection Act 1986

Sentencing Act 1995

* Now the Department of Environment and Conservation

Figure 1 Generalised process of identification, reporting and management of known or suspected contaminated sites

(Please note that this Figure illustrates the general process of identification, reporting and management of sites, and is not intended to describe all possible site classifications or the criteria for their allocation.
For further information on site classifications, please refer to the DEC guideline *Site Classification Scheme* (2001))

Person Responsible	Suspected Contaminated Site	Known Contaminated Site
Owner, occupier of site, person responsible for causing or contributing to contamination (or third party wishing to report site)	**Identification of Site** An inspection of the site, and/or historical records indicate that spillage or leakage of a substance has occurred which may pose a risk to human health, the environment or an environmental value. No sampling has yet been completed to determine the contamination status of the site.	**Identification of Site** Investigations at a site involving the collection and laboratory analysis of soil samples show volatile substances to be present at concentrations above the assessment levels documented in the DEC guideline *Assessment Levels for Soil, Sediment and Water* (2003) and at levels that pose a risk to site occupiers.
Owner, occupier of site, person responsible for causing or contributing to contamination (or third party wishing to report site)	**Reporting of Site** Report site as a suspected contaminated site to DEC under s11 of CS Act, by completing Form 1.	**Reporting of Site** Report site as a known contaminated site to DEC under s11 of CS Act, by completing Form 1.
DEC in consultation with Department of Health (DoH)	**Registration and Classification of Site** DEC receive report and consider the information provided. Assuming the information provides grounds to indicate possible contamination of the site, the site will be classified as *possibly contaminated – investigation required* and listed on the register of reported sites.	**Registration and Classification of Site** DEC receives report and considers the information provided. Assuming the information shows the site is contaminated and remediation is required, the site will be classified as *contaminated – remediation required* and listed on the public contaminated sites database.
DEC	**Notification of Classification** Written notification of classification provided to each owner and occupier of site, person who submitted the report, relevant public authority including local government, and any person the DEC CEO believes it is necessary to notify (including mortgagees registered on title).	**Notification of Classification** Written notification of classification provided to each owner and occupier of site, person who submitted the report, relevant public authority including local government, and any person the DEC CEO believes it is necessary to notify (including mortgagees registered on title).
DEC in conjunction with Department of Land Information (DLI)	Because site classification is *possibly contaminated – investigation required*, memorial will be registered on Certificate of Title for property.	Because site classification is *contaminated – remediation required*, memorial will be registered on Certificate of Title for property.
Owner, occupier of site, person responsible for causing or contributing to contamination	**Investigation of Site** Environmental consultants engaged to conduct an investigation of the site in accordance with the DEC *Contaminated Sites Management Series* guidelines. Where required under CS Act or Regulations, accredited contaminated sites auditor engaged to audit consultant's investigations.	**Remediation of Site** Environmental consultants engaged to conduct remediation of the site in accordance with the DEC *Contaminated Sites Management Series* guidelines. Where required under CS Act or Regulations, accredited Contaminated Sites Auditor engaged to audit consultant's work.
Consultant and, if necessary, accredited contaminated sites auditor	Consultants' and, if necessary, auditor's report submitted to DEC	Consultants' and, if necessary, auditor's report submitted to DEC
DEC in consultation with DoH	**Re-classification of Site** DEC receives consultants'/auditor's report and considers information provided. Assuming the information shows that, after investigation, the site is found not to be contaminated, the site will be re-classified as *not contaminated – unrestricted use* and the register of reported sites will be updated.	**Re-classification of Site** DEC receives consultants'/auditor's report and considers information provided. Assuming the information shows that the site has been remediated and is suitable for all uses, the site will be re-classified as *decontaminated*, removed from the public database and listed on the register of reported sites.
DEC	**Notification of Re-Classification** Written notification provided to each owner and occupier of site, person who submitted the report, relevant public authority including local government, and any person the DEC CEO believes it is necessary to notify (including mortgagees registered on title).	**Notification of Re-Classification** Written notification provided to each owner and occupier of site, person who submitted the report, relevant public authority including local government, and any person the DEC CEO believes it is necessary to notify (including mortgagees registered on title).
DEC in conjunction with DLI	Because site re-classified as *not contaminated – unrestricted use*, memorial withdrawn from Certificate of Title.	Because site re-classified as *decontaminated*, memorial withdrawn from Certificate of Title.

If investigation shows site is contaminated and remediation is required

APPENDIX A

Examples of scenarios which may be considered in the context of determining whether a site should be reported under the *Contaminated Sites Act 2003*

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Examples of scenarios which may be considered in the context of determining whether a site should be reported under the *Contaminated Sites Act 2003*

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Leaking solvent storage tank	Solvents leaking from a tank have impacted soil and also groundwater. The contaminated groundwater discharges into a nearby stream and is causing harm (as determined by a risk assessment) to the ecology of the stream, people that use the creek for recreation or drinking water, and the beneficial uses of the groundwater.	✓			✓	Yes
Chemical spill	A spill from a tank at an industrial plant leaked through a surface bund and entered the soil and groundwater. The impacted groundwater discharges to a nearby wetland; vegetation at the groundwater discharge area shows signs of stress or death.	✓			✓	Yes
Groundwater impacted by petroleum hydrocarbons	Sampling has shown groundwater to be impacted and groundwater is moving in the direction of neighbouring residents where hydrocarbon vapours may accumulate beneath dwellings and cause a potential risk because of the possibility of inhalation of harmful vapours. The information indicates there is a source (impacted groundwater), pathway (groundwater migration) and receptor (residents). Although the plume has not yet migrated beneath the residences, urgent action would be required to prevent the groundwater plume moving further.	✓			✓	Yes

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Workshop – mechanical/abrasive blasting/	Degreaser (containing solvents) at a mechanical workshop has been disposed of into a soak well over many years and the site is near a wetland. It is likely that the solvents seeping from the soak well have impacted soil and groundwater, and that impacted groundwater would discharge into the wetland. In this example there is an assumed source (degreaser seeping from the soak well) and a suspected pathway (groundwater) and receptor (groundwater, wetland).		✓	✓		Yes
Groundwater impact	Groundwater impact (as determined by groundwater testing) has migrated offsite and contamination has been detected on a neighbouring property in a domestic bore currently in use for irrigation purposes. This is a known risk due to possible skin exposure of people, pets, etc. that could have contact with the irrigation water.	✓			✓	Yes
Service station	Inventory records kept at the site have identified loss of fuel product over a period of time. Subsequent integrity testing of the underground storage tanks and associated pipework confirmed a leak through which the "missing" fuel could have entered the soil and affected groundwater. In this scenario there is an identified contamination source (leaking tanks) and there are suspected pathways and receptors (groundwater).		✓	✓		Yes
Organic soil stockpile (acid sulphate potential)	A stockpile of peat soil at a site has been showing signs of acidic runoff over time. The acid runoff represents a source of contamination which could have impacted the underlying soils and groundwater.		✓	✓		Yes
Uncontrolled fill	Excavations have identified a layer of fill material which appears to be industrial-type waste. The fill material represents an assumed source which could have leached metals or other contaminants to the groundwater and may be adversely impacting groundwater receptors including wetlands, or domestic groundwater users. It may also present a risk to human health if substances such as asbestos are present.		✓	✓		Yes

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Sites that have already been investigated and are subject to ongoing management	A site has been investigated by an environmental consultant who has identified that groundwater is impacted by hydrocarbons. The groundwater is subject to ongoing remediation via monitored natural attenuation. The impacted groundwater represents a source to offsite receptors including groundwater and would therefore be considered a risk by DEC.	✓			✓	Yes
Sites that have already been investigated and fully cleaned up	Prior to commencement of the CS Act, a site was thoroughly investigated by an environmental consultant in accordance with the DEC *Contaminated Sites Management Series* guidelines. The investigation identified that soil had been impacted by hydrocarbons but that groundwater had not been affected. The impacted soil was excavated and cleaned up by bioremediation. Subsequent validation sampling (prior to commencement of the CS Act) confirmed that the remediation had been successfully completed. No other potentially contaminating activities have occurred at the site since the remediation was completed, and there are no other suspected contaminants at the site. This site would not need to be reported to DEC as, at the time of commencement of the CS Act, there is no reason to know or suspect that the site is contaminated.	✓				No
Historical landfill	A site that is currently used for public recreation was historically used as a landfill site. The quality of groundwater in the vicinity is unknown. On-going management is required to fill in areas of subsidence due to decomposition of the waste material, and special management measures would also be required if any excavation were to be undertaken, to protect the health of workers and the public.		✓	✓		Yes
Existing landfill	Routine groundwater monitoring undertaken around a currently operating landfill identifies that landfill leachate has impacted groundwater. The extent of impact has not yet been delineated and the possible presence of receptors has not yet been determined.	✓		✓		Yes

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Septic tank	A house has a septic tank for the treatment of wastewater. The septic tank has been properly maintained and has only received household domestic wastewater. Assuming that there are no other suspected contaminants at the site, this would not need to be reported to DEC. The *Contaminated Sites Regulations 2006* contain exemptions from the definition of "contaminated" in the *Contaminated Sites Act 2003* for sewage, effluent or liquid waste which is or has been treated in "a domestic sewage apparatus" which is operated properly.		✓			No
Farm – application of pesticides	A farm has applied pesticides and fertilisers to soil in accordance with manufacturers' specifications, to aid in crop production. Assuming that there are no other suspected contaminants at the site and there has been no change to the use to which the land is put since the pesticides and fertilisers were applied, this site would not require reporting to DEC. The *Contaminated Sites Regulations 2006* contain exemptions from the definition of "contaminated" in the *Contaminated Sites Act 2003* for substances present as a result of the correct application of fertilisers, herbicides and pesticides to land, provided there has not been a change to the use to which the land is put since the fertiliser, herbicide or pesticide was applied.		✓			No
Farm (including market gardens) – Land development	A farm has undergone cropping and fertilisers, herbicides and pesticides have been applied to the land in accordance with the manufacturers' specifications. The site has since been rezoned for residential use. Site investigations undertaken in order to comply with a condition of subdivision approval identified metals and pesticides in soil at concentrations above assessment levels documented in the DEC guideline *Assessment Levels for Soil, Sediment and Water* (2003). Further investigation and risk assessment is required to determine whether these substances will pose a risk to future residents.	✓		✓		Yes

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Farm – pesticide storage shed	A farm has a shed where normal farm herbicides/pesticides are stored. There is a known history of spills and leaking storage drums, and the leaked chemicals have infiltrated into the soil around the shed. No plants or weeds are observed to grow in this area of soil around the shed.		✓	✓		Yes
Farm – cattle or sheep dip area	A farm has an area that was historically used for sheep or cattle dipping over a number of years. Chemicals which are persistent in the environment, such as arsenic and organochlorine pesticides, are known to have been used. The dipping bath was not fully sealed and the adjacent draining pen was unsealed.		✓	✓		Yes
Asbestos roofing and fencing	A house has roofing and fencing made of fibre cement sheeting containing asbestos, which is in good condition. Assuming there are no other suspected contaminants at the site or fragments of asbestos cement material in the soil, this site would not require reporting to DEC. The *Contaminated Site Regulations 2006* contain exemptions from the definition of "contaminated" in the *Contaminated Sites Act 2003* for substances which are part of a building or structure, or are wholly contained within a building.		✓			No

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
House	A house has had pesticides sprayed under a house pad or around stumps to prevent termite infestations. Assuming that there are no other suspected contaminants at the site and there has been no change to the use to which the land is put (that would expose the impacted soil to receptors) since the pesticides were applied, this site would not require reporting to DEC. The *Contaminated Sites Regulations 2006* contain exemptions from the definition of "contaminated" in the *Contaminated Sites Act 2003* for substances present as a result of the correct application of fertilisers, herbicides and pesticides to land, provided there has not been a change to the use to which the land is put since the fertiliser, herbicide or pesticide was applied.		✓			No
Wastewater treatment plant	A wastewater treatment plant has a series of ponds that are used to treat wastewater. The final pond is unlined and is used to dispose the treated wastewater via infiltration. The water quality in the final, unlined pond is known to be high in nutrients. Groundwater samples collected as part of routine monitoring identified high concentrations of nutrients in bores down hydraulic gradient from the pond. The extent of impact and possible receptors have not yet been investigated.	✓		✓		Yes
Depot / machinery storage	An area where machinery is stored shows signs of fuel and oil spillage on the soil surface (i.e. the soil is stained). It is found that this staining extends deeper than the surface (approx. top 10 cm) soils, although the total depth of staining has not yet been determined. It is possible that, over time, a large quantity of hydrocarbons have been spilt on the soil surface resulting in soil, and possibly groundwater, containing fuels/oils at concentrations which could pose a risk to human health, the environment or an environmental value.		✓	✓		Yes

Situation	Example scenario	Soil and groundwater sampling undertaken?		Contamination status?		Report to DEC under s.11 of the CS Act?
		Yes	No	Suspected	Known	
Substance (chemical) Spill	A spill of a liquid chemical occurred at an industrial site. Emergency clean up of the spill area was completed soon after the spill occurred through removal of impacted soil. However, no validation samples were collected following the clean up (i.e. it has not been confirmed that all impacted soil was removed) and it is not known whether the spilt liquid chemical reached the groundwater.		✓	✓		Yes
Mine site - tailing storage facility	Routine groundwater monitoring undertaken around a tailings storage facility identifies that groundwater has been impacted. The extent of impact has not yet been delineated and the possible presence of receptors has not yet been determined.	✓		✓		Yes
Mine site – heap leach pad	The heap leach pad at a mine site overflowed due to extreme weather conditions and a significant volume of material was released to the environment. The released material has been removed and validation samples have confirmed that no residual material remains. Assuming that there are no other suspected contaminants at the site, this site would not require reporting to DEC.	✓				No