

# EPA TASMANIA

## – TECHNICAL GUIDELINE –

### UNDERGROUND PETROLEUM STORAGE SYSTEMS: DECOMMISSIONING ASSESSMENT SAMPLING AND RISK ASSESSMENT REQUIREMENTS

#### 1 Introduction

This EPA Technical Guideline provides detail on the sampling and risk assessment that must be conducted as part of the assessment requirements when an underground petroleum storage system (UPSS) is permanently decommissioned. The decommissioning assessment must determine whether petroleum hydrocarbons have contaminated the soil or groundwater within the vicinity of the storage system and whether this contamination is likely to cause an unacceptable risk to a receptor (including environmental and human receptors). A flowchart summarising the process is attached.

This EPA Guideline is not appropriate for situations where the whole site needs to be assessed, for example, to determine whether a site is suitable for redevelopment.

This EPA Guideline is issued pursuant to section 42 of the *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010* (UPSS Regulations). The guideline is referred to in regulations 30(7)(b) and 31(2)(b), which relate to the decommissioning of active and abandoned storage systems respectively. In both cases soil (and water if present) in the vicinity of the decommissioned UPSS must be assessed for petroleum contamination and an assessment report detailing this assessment must be obtained by the Infrastructure Owner. Regulations 30(7)(b) and 31(2)(b) state that if there are any EPA Guidelines, in relation to the assessment to determine whether any petroleum has contaminated the soil or groundwater within the vicinity of the storage system, then the assessment must be conducted in accordance with those guidelines.

Note: This EPA Technical Guideline replaces Information Bulletin 109 - Underground Petroleum Storage System Decommissioning Guidelines. For additional decommissioning information see <http://epa.tas.gov.au/regulation/decommissioning-storage-systems>.

The sampling and risk assessment required in this Guideline must be undertaken or reviewed by professionals who are certified under the Site Contamination Practitioners Australia scheme or under interstate Contaminated Land Auditor schemes. The directory of certified practitioners is located at: <http://scpaaustralia.com.au/scp-australia-directory/> and further information regarding interstate Auditor schemes is located at <http://epa.tas.gov.au/regulation/engaging-a-contaminated-land-consultant>.

## 2 Purpose and scope

The purpose of this guideline is to establish the minimum standard for data collection and risk assessment that must be undertaken when a UPSS is decommissioned. This will help to ensure that the conclusions in the assessment report can be relied upon by the Infrastructure Owner and the Director, Environment Protection Authority. The guideline requires that:

- a minimum number of soil samples and water samples (if water is present) are collected from the vicinity of the UPSS;
- if contamination is detected, a risk assessment is conducted including a conceptual site model (CSM) to determine whether
  1. the contamination is likely to pose an unacceptable risk to a receptor; and
  2. management and/or remediation measures are necessary to lower the risk to an acceptable level.

Where these conclusions cannot be reached without further work being undertaken the further work must be completed and reported on within 4 months of the original Decommissioned UPSS Form being submitted.

It should be noted that the sampling and risk assessment only relate to the area in the vicinity of the UPSS. This may not be a sufficient investigation to satisfy Planning Authority requirements where a change of use or development is proposed. For example, additional sampling may be required if the site is going to be used as a residence or there has been another potentially contaminating activity on the site such as a mechanic's workshop. The Infrastructure Owner/Landowner should be consulted as to the purpose of the assessment being undertaken prior to works commencing.

This guideline is relevant to Infrastructure Owners who are decommissioning a UPSS and to environmental site assessors undertaking the decommissioning assessment.

This document does not outline safety requirements for decommissioning UPSS. There should be appropriate health and safety measures in place for any personnel involved in the decommissioning assessment in accordance with the *Work Health and Safety Act 2012* (WHS Act) and Regulations (2012). All site assessors should ensure that their investigations are undertaken in accordance with the WHS Act, as well as industry occupational health and safety procedures, where applicable. It is also essential that all works are in compliance with relevant local and state based requirements for environmental management.

## 3 Soil and Water Sampling

All sampling must be done in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013) (ASC NEPM) and, where relevant, Australian Standards AS 4482.1, AS 4482.2 or AS 5667.11 as well as the sampling standards listed on the EPA Division's *Minimum Standards for Reporting on Contaminated Sites* web page (<http://epa.tas.gov.au/regulation/minimum-standards-for-reporting>).

The sampling regimes in Sections 3.1 and 3.2 below, define the minimum number of samples that must be taken. If the sampling regime undertaken varies from these minimum standards, the variations must be adequately explained and justified in the Decommissioning Assessment Report. For example, if sampling is not possible due to the presence of rock this must be explained.

## UPSS 2

If site conditions are complicated, additional samples must be taken to achieve a more accurate assessment of site contamination (e.g. at sites with complex underlying geology such as multiple soil horizons).

Only freshly exposed surfaces are suitable for sampling volatile and semi-volatile contaminants. Samples must therefore be collected immediately after the excavated surface is exposed otherwise the samples may need to be taken from within the soil profile to obtain a fresh sample.

Selection of contaminants to be analysed for must be based on the potential sources of contamination and contaminants of concern identified in the site history.

Contaminants to be considered include:

- TRH - Total Recoverable Hydrocarbons (reported in the fractions: C<sub>6</sub>-C<sub>10</sub> (F1), >C<sub>10</sub>-C<sub>16</sub> (F2), >C<sub>16</sub>-C<sub>34</sub> (F3), and >C<sub>34</sub>-C<sub>40</sub> (F4));
- Benzene, Ethylbenzene, Toluene, and total Xylenes;
- Naphthalene / Polycyclic aromatic hydrocarbons (PAHs) (if diesel fuel or waste oil was ever stored on site or if the fuel type is unknown); and
- Lead (if leaded fuel or waste oil was ever stored on site or if the fuel type is unknown).

Other contaminants that may need to be analysed for include:

- Phenols (waste oil, kerosene or diesel tanks); and
- Fuel additives such as ethanol etc.

All samples collected must be analysed by a laboratory accredited for the relevant analytical procedures by the National Association of Testing Authorities, Australia (NATA), by an organisation recognised under NATA's Mutual Recognition Agreement (MRA), or by a laboratory approved, in writing, by the Director, Environment Protection Authority.

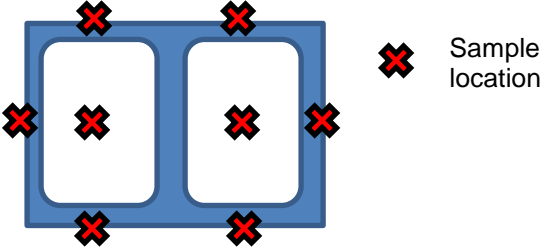
### 3.1 Sampling Regime when UPSS Decommissioning by Removal

When an underground petroleum storage system (UPSS) has been removed in accordance with regulation 30(6)(a) or 31(1)(a) of the UPSS Regulations, soil samples must be taken from the excavations as soon as possible after infrastructure removal is complete to prevent loss of volatile compounds. (Note that all UPSS infrastructure including lines and fill points must be removed).

When sampling soil from a UPSS pit, samples must be taken from areas most likely to be contaminated. This will usually mean that samples are obtained from the base of the pit, and from the walls of the pit near the base. However, if changes in lithology are evident in the pit walls, samples must be taken from the most permeable strata that could be impacted by a leak from the UPSS. If water is present in the pit, soil samples must be collected from the walls at the water interface as this is the area most likely to have the highest concentrations of contaminants, and a sample of the water must also be taken.

Table 1 below outlines the minimum sampling protocol that must be followed. However, access and safety constraints must be taken into account. If samples cannot be collected for some reason then this must be explained and justified in the Decommissioning Assessment Report.

**Table 1: Minimum Sampling Protocol – Tank Removal**

Location	Number of samples and locations
UPSS tank pit packing/bedding sands	One sample of packing/bedding sands per tank from at or below the base of the tank.
UPSS tank pit	<p>Five samples from soils underlying packing/bedding sands for first tank (1 from base of each wall + 1 from base of pit). Note: 3 more samples must be collected for each additional tank that was located within the same pit. See sketch below.</p> 
Water in UPSS tank pit (if present)	One sample per pit
Fuel lines	<ul style="list-style-type: none"> <li>• One sample per 5m of line from backfill sands; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul>
Remote fill points	<ul style="list-style-type: none"> <li>• One sample per fill point from backfill sands; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul>
Bowzers	<ul style="list-style-type: none"> <li>• One sample per bowser (adjacent to line and bowser junction) from backfill sand; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul> <p>Note: One sample per bowser island is not sufficient.</p>

\* based on field observations which could include PID, visual observations of staining, odour etc.

Note:

- Soil samples must be taken *in situ*, not from a stockpile.
- If an area exhibits signs of leakage/contamination, at least one sample must be taken from this area. This may be part of, or in addition to, the sampling listed above.

### 3.2 Sampling Regime When Decommissioning *In Situ*

When a UPSS is decommissioned *in situ*, in accordance with Section 30(6)(b) or 31(1)(b) of the UPSS Regulations, the sampling regime outlined in Table 2 below must be followed. However, access and safety constraints must be taken into account. If samples cannot be collected for some reason then this must be explained and justified in the Decommissioning Assessment Report.

It should be noted that only the tank is left *in situ*. All piping, fill points etc. must be removed.

**Table 2: Minimum Sampling Protocol – Tank filling (left *in situ*)**

Location	Number of samples and locations
Soils adjacent to UPSS tank	Four per tank (from four separate bores). One sample must be taken from each bore immediately below the estimated depth of the bottom of the tank. Bores should be drilled adjacent to the tank at the most appropriate locations considering the site conditions.
Water (if present)	If water is intersected in one or more boreholes, at least one groundwater monitoring well must be installed. A water sample must be taken from the surface of the water column and an additional soil sample must be taken as close as possible to the point where water was intersected.
Fuel lines	<ul style="list-style-type: none"> <li>• One sample per 5m of line from backfill sands; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul>
Remote fill points	<ul style="list-style-type: none"> <li>• one sample per fill point from backfill sands; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul>
Bowzers	<ul style="list-style-type: none"> <li>• One sample per bowser (adjacent to line and bowser junction) from backfill sand; and</li> <li>• if the backfill sands show signs of leakage/contamination* then one sample from soils underlying those signs.</li> </ul> <p>Note: one sample per bowser island is not sufficient.</p>

\* based on field observations which could include PID, visual observations of staining, odour etc.

Note:

- Soil samples must be taken *in situ*, not from a stockpile.
- If an area exhibits signs of leakage/contamination, at least one sample must be taken from this area. This may be part of, or in addition to, the sampling listed above.

#### 4 Risk Assessment

Where all the samples return analytical results below laboratory reporting levels, no risk assessment is necessary. See Section 5 below for reporting requirements that must be adhered to.

Where sampling detects pollutants above laboratory reporting levels, a risk assessment must be conducted in accordance with the ASC NEPM to determine whether:

- the contamination detected is likely to pose an unacceptable risk to a receptor. This must include consideration of on- and off-site receptors and current and intended land uses and current and realistic uses of groundwater;
- management measures and/or remediation is/are necessary to lower the risk to receptors to an acceptable level; and/or
- further investigations are needed before determination of risk to receptor/s is possible.

The first stage of the risk assessment is the development of a conceptual site model (CSM). *“The development of a CSM is an essential part of all site assessments and provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future”* (ASC NEPM Schedule B2 Chapter 4, pg.14). The CSM must describe the source(s) of contamination, the pathway(s) by which contaminants may migrate through the various environmental media (including preferential pathways such as service trenches), and any receptors (human or ecological) which may be impacted by the contamination. For example, where pollutants exist in soil the CSM must consider whether this contamination could migrate to groundwater and whether the groundwater could affect a receptor, taking into consideration groundwater depth, soil type and distances to neighbouring properties, water courses, groundwater wells etc. Note that in Schedule B1 of the ASC NEPM (Chapter 3.5) it is stated that: *“Possible impacts on groundwater should always be considered particularly for sites impacted by petroleum hydrocarbons. In some cases the soil may not reveal contaminants of concern while groundwater is affected”*.

If there are current or likely future complete or potential pathways between the known or potential sources and a receptor, risk characterisation will be necessary to determine the level of risk posed to the receptor.

Risk characterisation must determine whether the contamination is likely to pose an unacceptable risk to a receptor. This must include consideration of on- and off-site receptors and current and intended land uses and current and realistic uses of groundwater.

If an unacceptable risk to a receptor is likely then management measures to lower the risk to an acceptable level must be determined or remediation methods recommended.

If further investigations are needed to be able to define whether an unacceptable risk is likely to occur, then the scope of these further investigations must be determined as part of the risk assessment.

Where further investigations have been defined they must proceed and another Decommissioned UPSS Form must be submitted to the Director EPA, summarising the findings of the further work with reference to risk, within 4 months of the original Decommissioned UPSS Form being submitted.

## 5 Reporting

Where a UPSS is decommissioned under regulation 30 or 31 of the UPSS Regulations, the Infrastructure Owner must ensure that they receive the Decommissioning Assessment Report within four months of decommissioning occurring. A Technical Guideline outlining the information that must be included in a Decommissioning Assessment Report can be found at: <http://epa.tas.gov.au/regulation/decommissioning-storage-systems>.

Information relating to the risk assessment must be included in the Decommissioning Assessment Report. If any of the above sampling or risk assessment requirements are not adhered to, reasons for using an alternative approach must be fully explained and justified in the report.

The Infrastructure Owner must, within 7 days of obtaining the Decommissioning Assessment Report, notify the Director, Environment Protection Authority in the approved form (in accordance with regulation 30(8) or 31(3) of the UPSS Regulations). See <http://epa.tas.gov.au/regulation/decommissioning-storage-systems> for further information.

## UPSS 2

If further work is necessary then this must be conducted and reported to the Infrastructure Owner so that the Infrastructure Owner can resubmit a Decommissioned UPSS Form to the Director, EPA within 4 months of the original Decommissioned UPSS Form being submitted.

### 6 Contact for further information

Contaminated Sites Unit  
EPA Division  
Department of Primary Industries, Parks, Water and Environment  
Ph: (03) 6165 4594  
Email: [ContaminatedSites@environment.tas.gov.au](mailto:ContaminatedSites@environment.tas.gov.au)  
Web: <http://epa.tas.gov.au/regulation/>

### 7 REFERENCE

National Environment Protection Council Service Corporation, 1999. *National Environment Protection (Assessment of Site Contamination) Measure 1999*. (as amended 2013) (ASC NEPM);

AS 4482.1: Australian Standard AS 4482.1 Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds, issued and published on 2 November 2005, as amended or substituted from time to time;

AS 4482.2: Australian Standard AS 4482.2 Guide to the sampling and investigation of potentially contaminated soil – Volatile substances, issued and published on 5 September 1999, as amended or substituted from time to time;

AS 5667.11: Australian Standard AS 5667.11 Water quality – Sampling – Guidance on sampling of groundwaters, issued and published on 5 April 1998, as amended or substituted from time to time;

Attachment 1: Flowchart showing Decommissioning Assessment and Reporting Process

