



Ministry of
Water, Land and Air Protection

PROCEDURE MANUAL

SUBJECT
**Protocol for Regulation of Petroleum
Hydrocarbons in Water under the Special Waste
and Contaminated Sites Regulations**

This procedure replaces:

Contaminated Sites Protocol 7: "Regulation of Petroleum Hydrocarbons in Water under the Contaminated Sites and Special Waste Regulations", July 19, 1999.

Staff, Organizations directly affected:

Environmental Management
Environmental Protection Regional Operations

Policy cross-references:

Special Waste Regulation
Contaminated Sites Regulation

Other cross-references:

None.

Purpose:

This procedure provides a protocol for the regulation of petroleum hydrocarbons in water under the Special Waste and Contaminated Sites Regulations pursuant to section 53 of the Special Waste Regulation.

Procedure:

Introduction

1. This protocol describes the application of numerical standards for petroleum hydrocarbons in water under Schedule 6 of the Contaminated Sites Regulation (CSR).

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AUTHORIZATION

SIGNATURE

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Ministry of
Water, Land and Air Protection

PROCEDURE MANUAL

VOLUME SECTION SUBSECTION PAGE
3 of 7

SUBJECT
Protocol for Regulation of Petroleum
Hydrocarbons in Water under the Special Waste
and Contaminated Sites Regulations

- i) the absence of detectable petroleum hydrocarbon concentrations; or
- ii) petroleum hydrocarbon concentrations below the numerical water standard for the nearest downgradient water use (e.g. drinking water or aquatic life).

“**preferential flow pathway**” means a pathway capable of conveying groundwater at a velocity greater than the average linear flow velocity of groundwater in a petroleum hydrocarbon contaminated aquifer. Preferential flow pathways can occur along underground utilities, for example sewers, water and gas lines, or along surface depressions or ditches that intersect and drain shallow aquifers.

“**VPHw**” means volatile petroleum hydrocarbons in water, and includes volatile petroleum hydrocarbons with the exception of benzene, toluene, ethylbenzene and xylenes.

“**VHw₆₋₁₀**” means volatile petroleum hydrocarbons in water, including benzene, toluene, ethylbenzene and xylenes.

2. Overview

As provided in Table 1, this protocol changes the regulatory system with respect to the management of petroleum hydrocarbons in water at contaminated sites such that:

- (1) the leachate quality standards for benzene, toluene, ethylbenzene and xylenes in the SWR no longer apply to the regulation of petroleum hydrocarbons in water;
- (2) where a water use described in the CSR *is applicable* at a site, groundwater contaminated with petroleum hydrocarbons need not be managed on the basis of the leachate quality standards for benzene, toluene, ethylbenzene and xylenes in the SWR but rather must be managed in accordance with the numerical water standards of the CSR for benzene, toluene, ethylbenzene, xylene, volatile petroleum hydrocarbons (VPHw) and light extractable petroleum hydrocarbons (LEPHw) as specified in the CSR for that water use;
- (3) where the water uses described in the CSR *are not applicable* at a site, petroleum contaminated groundwater need not be managed on the basis of the leachate quality standards for benzene, toluene, ethylbenzene and xylenes of the SWR but rather must be managed in accordance with the numerical water standards of the CSR for VHw₆₋₁₀ and EHW₁₀₋₁₉; and

DATE EFFECTIVE
May 13, 2002

REVISION NO.



Ministry of
Water, Land and Air Protection

PROCEDURE MANUAL

VOLUME SECTION SUBSECTION PAGE
4 of 7

SUBJECT
**Protocol for Regulation of Petroleum
Hydrocarbons in Water under the Special Waste
and Contaminated Sites Regulations**

(4) at all sites, regardless of water use, the numerical water standards of the CSR for VHW₆₋₁₀ and EHW₁₀₋₁₉ apply.

This protocol does not authorize any change in the application of the leachate quality standards in the SWR to the regulation of petroleum hydrocarbon contaminated soil.

3. **Special Waste Regulation – Authorization and Mandatory Conditions**

3.1 **Authorization**

Pursuant to Section 53 of the SWR, leachable toxic waste containing benzene, toluene, ethylbenzene and xylenes in groundwater at a contaminated site is exempt from the regulatory provisions of the SWR, provided the groundwater is managed in accordance with the regulatory requirements of the CSR and the conditions of this protocol outlined below.

3.2 **Mandatory Conditions**

- 3.2.1 For conditions 3.2.2 and 3.2.3 below, the water use assigned at the plume front applies to all properties that contribute to, or are impacted by, the petroleum hydrocarbon plume.
- 3.2.2 Where the petroleum hydrocarbon contaminant plume front is located the lesser of 1 km or 50 years groundwater travel time from the nearest aquatic receiving environment, the applicable water use is aquatic life and the applicable standards are the CSR aquatic life numerical water standards.
- 3.2.3 Where the petroleum hydrocarbon contaminant plume front is located the lesser of 1.5 km or 100 years groundwater travel time from the nearest existing or probable future drinking water supply, the applicable water use is drinking water and the applicable standards are the CSR drinking water numerical water standards.
- 3.2.4 At all sites, regardless of water use, the water quality standards for VHW₆₋₁₀ and EHW₁₀₋₁₉ apply.

DATE EFFECTIVE
May 13, 2002

REVISION NO.



Ministry of
Water, Land and Air Protection

PROCEDURE MANUAL

SUBJECT
**Protocol for Regulation of Petroleum
Hydrocarbons in Water under the Special Waste
and Contaminated Sites Regulations**

Table 1: Special Waste Regulation and Contaminated Sites Regulation Standards for Petroleum Hydrocarbons in Water

Substance	Special Waste Regulation	Contaminated Sites Regulation	
	Leachate Quality Standards (ug/L)	Aquatic Life Water Standards (ug/L)	Drinking Water Water Standards (ug/L)
Benzene	500	4 000 ^{1,2} , 1 000 ^{2,3}	5
Ethylbenzene	240	2 000 ^{1,2} , 2 500 ^{2,3}	2.4
Toluene	2 400	390 ^{1,2} , 3 300 ^{2,3}	24
Xylenes	30 000	NS ⁴	300
VPHw	NS ⁴	1 500 ²	NS ⁴
LEPHw	NS ⁴	500 ²	NS ⁴
VHW ₆₋₁₀	NS ⁴	15 000 ⁵	15 000 ⁵
EHw ₁₀₋₁₉	NS ⁴	5 000 ⁵	5 000 ⁵
Nonaqueous Phase liquids	NS ⁴	not present ⁶	not present ⁶

Footnotes

- ¹ Standard to protect freshwater aquatic life.
- ² This generic standard may be modified by developing a site-specific standard. Consult director for further advice.
- ³ Standard to protect marine and/or estuarine aquatic life.



Ministry of
Water, Land and Air Protection

PROCEDURE MANUAL

VOLUME SECTION SUBSECTION PAGE
7 of 7

SUBJECT
**Protocol for Regulation of Petroleum
Hydrocarbons in Water under the Special Waste
and Contaminated Sites Regulations**

⁴ NS - no standard.

⁵ Standard is applicable at all sites, irrespective of water use.

⁶ Water must be remediated so that nonaqueous phase liquids are not present in quantities in excess of that acceptable to a manager. For the purposes of this protocol, not present means VHW₆₋₁₀ and/or EHW₁₀₋₁₉ concentrations less than 15 000 µg/L and 5 000 µg/L, respectively. Concentrations greater than these levels could be considered proof of nonaqueous phase liquids presence.

DATE EFFECTIVE
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