



CWG & RIVM COMPLIANT TRH SPECIATION

CHARACTERISATION USING HILs UNDER NEPM DRAFT 2010

Organics are commonly analysed as a suite of parameters, (including TRH). This provides data on the quantity of specific analytes present. A TRH result is not, in itself, a direct indicator of risk to human health and sometimes more information is required to support a risk based decision. As referred to in the NEPM Draft 2010, in order to apply health investigation level (HIL) criteria, speciation of TRH is a particularly useful technique as it identifies groups of compounds with similar physicochemical and toxicological properties. HIL guidelines can then be applied based on toxicity and potential environmental transport of the designated groups. Exceedance of the HIL then determines if further health investigation and evaluation is required.

SPECIATION OF TRH

In late 2011, ALS developed and received NATA accreditation for an extensive TRH Aliphatic / Aromatic speciation analysis including both semi-volatile and volatile components. This method is designed to meet the needs of CWG guidance and RIVM fractional banding.

METHOD INFORMATION

ALS METHOD CODE

EP070 (Semi-volatile Fractions)
EP079 (Volatile Fractions)

LIMITS OF REPORTING (LOR)

See table 1

METHOD & OTHER REFERENCES

MaDEP Method for the Determination of Volatile Petroleum Hydrocarbons
Total Petroleum Hydrocarbon Criteria Working Group Series, Volumes 1 to 5.
Dutch RIVM Intervention Level for Petroleum Hydrocarbons

TARGET COMPOUNDS

TRH - Criteria Working Group (CWG)

Reporting Bands

Aliphatics C5—C6
Aliphatics >C6-C8
Aliphatics >C8-C10
Aliphatics >C10-C12
Aliphatics >C12-C16
Aliphatics >C16-C21
Aliphatics >C21-C35
Aromatics C5-C7
Aromatics >C7-C8
Aromatics >C8-C10
Aromatics >C10-C12
Aromatics >C12-C16
Aromatics >C16-C21
Aromatics >C21-C35

ANALYSIS OF SPECIATED TRH

Speciation analysis of volatile fractions is achieved using the selectivity of the GC-MS to identify aromatic compounds present in the respective bands of the TRH. Aromatic compounds are then subtracted from the relevant TRH band 'total' to calculate the aliphatic component.

Semi-volatile speciated TRH fractions are determined via GC-FID following the separation via selective elution of the aromatic fractions using an appropriately conditioned silica gel column.

Reporting bands are defined according to the EC (equivalent carbon number) classification based on the transport characteristics of the compounds present. The groupings are determined from a number of properties including solubility, vapour pressure and affinity to bind with soil, (see above).



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Table 1: LIMITS OF REPORTING (LOR's)

TARGET COMPOUNDS TRH - Criteria Working Group (CWG)	Standard LOR µg/L	Standard LOR mg/kg
METHOD CODE	EP070 / EP079	EP070 / EP079
Aliphatics C5—C6	20	5
Aliphatics>C6-C8	20	5
Aliphatics>C8-C10	20	5
Aliphatics>C10-C12	50	50
Aliphatics>C12-C16	50	50
Aliphatics>C16-C21	50	50
Aliphatics>C21-C35	50	50
Aromatics C5-C7	1	0.2
Aromatics>C7-C8	2	0.5
Aromatics>C8-C10	2	0.5
Aromatics>C10-C12	50	50
Aromatics>C12-C16	50	50
Aromatics>C16-C21	50	50
Aromatics>C21-C35	50	50

SAMPLING REQUIREMENTS

Standard ALS sampling bottles are required for this analysis, 'CWG Speciation' or methods EP070/EP079 should be requested on the COC to avoid confusion with other TPH/TRH methods. Container requirements are as follows:

- Water - 1 x 100 ml Amber (unpreserved) plus
2 x 40 ml Amber Vials (sulfuric acid preserved)
- Soil - 1 x 150 ml soil jar

HOLDING TIMES

- Waters - 7 days (plus 40 days from extraction).
- Soils - 14 days (plus 40 days from extraction)
- Samples should be chilled to <6 °C upon sampling and submitted to the laboratory as soon as possible.

ALS SUITES

ALS SUITE CODES	Matrix	TEST PARAMETER
W-29	Water	TRH(C6-C40)/BTEXN/ plus CWG Speciation Volatiles and Semi-Volatiles fractions
S-29	Soil	TRH(C6-C40)/BTEXN/ plus CWG Speciation Volatiles and Semi-Volatiles fractions

For further details, please contact ALS Melbourne on (03) 8549 9600, or ALS Perth on (08) 9209 7655 or your local ALS Client Services Team.

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Water Resources Group: Canberra, Bendigo, Geelong, Melbourne (Scoresby), Wangaratta, Traralgon