METHOD STATEMENT

Determinand:
Vinyl chloride (chloroethene)

Matrix:
Sample Type: Potable and Raw Waters

Principle of Method:
The water sample is placed in a septum vial and allowed to equilibrate with its headspace vapour at 60°C. A sample of the vapour is injected using an automatic headspace sampler into a capillary column gas chromatograph (GC), the volatile organic compounds are separated and then identified and quantified with mass spectrometric detection (MSD) in selected ion monitoring (SIM) mode.

Sampling and Sample Preparation:
Amber sampling vials are prepared prior to sending to samplers by the addition of 300µl of 1% (W/V) Sodium Thiosulphate solution as specified in the sampling manual.
The vial is slowly and completely filled to exclude headspace in order to avoid loss of volatile determinands. When the water just begins to overflow the vial it is capped with the PTFE face of the septum in contact with the sample. Samples are assessed for suitability on arrival in the laboratory, by inversion of the vial, where the bubble covers approximately two thirds of the bottom of the vial this is approximately equivalent to a bubble of 2 ml. Any bubble larger than this (i.e. covers the full width of the vial) is deemed to be significant, and a deviating comment should be made against the relevant test.
Storage – samples should be analysed as soon as possible after collection. When this is not possible, they should be stored under refrigeration at 3 ± 2°C in the dark, until analysis can begin. The maximum permissible storage time prior to analysis is 28 days.

Interferences
Any compound, which passes through the extraction procedure, and has similar Gas Chromatographic and mass spectrometric properties to the analyte will cause interference.

Performance of Method:

Range of Application:
LOQ to 2.500 µg/l

Limit of Quantification:

Determinand	LOQ GCHS1 (µg L^{-1})	LOQ GCHS2 (µg L^{-1})	LOQ Method Standardised (µg L^{-1})
Vinyl Chloride	0.113	0.076	0.113

Recoveries of Compounds and Uncertainty of measurement:
Instrument 1: WGCHS1

Determinand	Limit of Quantification (ng L^{-1})	Uncertainty of Measurement (UoM) (%)	Direct Standards				Elvington Treated Water	
			Low Standard		High Standard		PCV Spike	
			Recovery	RSD	Recovery	RSD	Recovery	RSD
Vinyl Chloride	113	44.145	100.80	5.00	90.96	5.96	99.33	5.15

Instrument 2: WGCHS2

Determinand	Limit of Quantification	Uncertainty of Measuremen	Direct Standards		Elvington Treated Water
			Low Standard	High Standard	PCV Spike

	(ng L^{-1})	t (UoM) (%)	Recovery	RSD	Recovery	RSD	Recovery	RSD
Vinyl Chloride	76	32.30	100.01	2.97	95.75	2.01	91.81	2.86

References:

Vinyl Chloride in Drinking Water, World Health Organisation, WHO/SDE/WSH/03.04/119
Air Quality Guidelines, Second Edition, Chapter 5.16, Vinyl Chloride, World Health Organisation Regional Office for Europe, Copenhagen, Denmark, 2000.
Vinyl Chloride, Public Health Statement, Agency for Toxic Substances and Disease Registry (ASTSDR), Division of Toxicology and Environmental Medicine, July 2006.
Vinyl Chloride - ToxFAQs, Agency for Toxic Substances and Disease Registry (ASTSDR), Division of Toxicology and Human Health Sciences, July 2006.
NA-TM-1102 v03 VOC/BTEX/F1/VH by HS-GCMS-FID, National Test Method, ALS Environmental (Canada).