METHOD STATEMENT

Determinand:
Determination of absorbance/transmittance at 254nm

Matrix:
Sample Types: Raw, Potable, Surface and Ground waters.

Principle of Method:
This method uses Shimadzu UV 1800 spectrophotometer
Generally, organic compounds exhibit absorbance in the UV wavelengths below 400nm and the 254nm wavelength is of particular interest. Dissolved organic halogens (including certain THMs, organic solvents, pesticides, PCBs and chlorinated aromatics) and aquatic humic substances (particularly humic acid and fulvic acid) all show absorbance characteristics at the 254nm wavelength. Consequently, routine measurement of either Absorbance or %Transmittance at the 254 nm wavelength can give valuable information on the overall organic composition of potable and raw waters, although it will not identify which specific organic chemicals are present.

Sampling and Sample Preparation:
Samples are normally collected in 500 ml PET bottles. Other size PET bottles are also suitable.
No special preservation is required
If analysis cannot be immediately undertaken, samples should be stored at a temperature of 1 - 5°C until the day of analysis. Samples should be warmed up to room temperature prior to analysis and analysed within 14 days of the sampling date.

Interferences
The method is empirical, so provided the samples are filtered to remove turbidity and no air bubbles are present within the cells, the method is not prone to any interferences.

Performance of Method:

Range of Application:
0 abs/m to 100 abs/m (0 abs/cm to 1 abs/cm). If the sample has an absorbance greater than 100 abs/m (1 abs/cm) then it should be diluted with deionised water and re-analysed. No reporting limit associated with absorbance/transmittance at 254nm

Limit of Quantification:
If a negative value is obtained then a value of zero should be reported, as there is no limit of quantification.

Recoveries of Compounds, Bias and Uncertainty of measurement:

% Transmittance

	NIST SRM 935A	AQC	Soft Water	Medium Water	Hard Water
Mean	13.873	89.877	99.46	62.04	90.39
SD	0.084	0.201	0.139	0.183	0.154
% Bias	0.53	-0.14	---	---	---
% Uncertainty	1.74	0.58	---	---	---

Absorbance

	NIST SRM 935A	AQC	Soft Water	Medium Water	Hard Water
Mean	0.858	0.046	0.002	0.207	0.044
SD	0.0026	0.0010	0.00061	0.0013	0.00074
% Bias	-0.26	1.20	---	---	---
% Uncertainty	0.87	5.4	---	---	---

References:
Shimadzu UV-1800 Spectrophotometer instruction guide/ operation manual.