METHOD STATEMENT

Determinand:
Manual determination of Turbidity.

Matrix:
Sample Types: Raw and Potable waters.

Principle of Method:
This method uses a Hach Turbidimeter model TU5200.
Turbidity is an expression of the optical property of a liquid that causes light to be scattered and absorbed rather than transmitted in straight lines through the sample. Turbidity is the measure of particulate and colloidal matter suspended in a solution and is used to measure the clarity of water for public health and aesthetic reasons.
The Turbidity of a sample is measured nephelometrically and the units of measurement are Nephelometric Turbidity Units (NTU).

Sampling and Sample Preparation:
Samples are normally collected in 500 ml PET bottles. Other size PET bottles are also suitable. Other bottle types may also be used providing they do not contain any preservatives.
If analysis cannot be immediately undertaken, samples should be stored at a temperature of 3 ± 2°C until the day of analysis. Samples should be allowed to equilibrate to room temperature prior to analysis, to prevent condensation on the sample cells, and analysed within 4 days of sampling.

Interferences
The nephelometric method of turbidity measurement depends on light scattering from suspended particles. Air bubbles in the vial as well as fingerprints, dirt and condensation on the cell, will cause interference with scattering of the light, causing artificially high results.

Performance of Method:

Range of Application:

LOQ – 50 NTU (using five calibration standards).

As assets are the same specification, the method reporting limit is 0.11 NTU.

Limit of Quantification:

Asset Number	Meter Name	LOQ
2731	Turb1	0.05NTU
2732	Turb2	0.06 NTU
2733	Turb3	0.07NTU
3037	Turb4	0.07 NTU
3389	Turb5	0.11 NTU

Recoveries of Compounds and Uncertainty of measurement:

Turbidity meter 1 (Asset 2731)

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Soft Treated (YW Langsett)	0.091	1.024	1.0	93.35	1.70
Medium Treated (Wakefield lab tap)	0.098	1.035	1.0	93.70	2.90

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Hard Treated (SWS Yew Hill)	0.081	1.028	1.0	94.66	2.74
Surface Raw (YW River Derwent at Elvington)	0.419	1.398	1.0	97.88	3.10
Ground Raw (YW Cowick Borehole)	0.091	1.037	1.0	94.61	2.17
Ultrapure (18.2MΩ lab water)	0.068	1.039	1.0	96.15	15.78

Turbidity meter 2 (Asset 2732)

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Medium Treated (Wakefield lab tap)	0.113	1.096	1.0	98.37	2.03

Turbidity meter 3 (Asset 2733)

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Medium Treated (Wakefield lab tap)	0.106	1.093	1.0	98.68	2.30

Turbidity meter 4 (Asset 3037)

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Medium Treated (Wakefield lab tap)	0.099	1.096	1.0	99.72	3.30

Turbidity meter 5 (Asset 3389)

Sample type	Mean sample result (NTU)	Mean sample spike result (NTU)	Conc. of spike (NTU)	Spike recovery (%)	% Uncertainty
Medium Treated (Wakefield lab tap)	0.113	1.090	1.0	97.67	2.59

References:

Colour and Turbidity of Waters 1981(HMSO), Methods for the examination of Waters and Associated Materials. ISBN 0117519553