



## ANDalyze Receives US EPA ETV Validation Report for Testing Water with Patented DNAzyme technology

ANDalyze has received notice from the US Environmental Protection Agency (US EPA) that they have completed their evaluation of the ANDalyze products for ANALYSIS FOR DRINKING, WASTE, AND ENVIRONMENTAL WATERS. US EPA has issued a report on the evaluation testing that concludes that the ANDalyze DNAzyme products is a valid test for water as defined by ANDalyze. The testing focused on the ANDalyze lead (Pb) sensor as the test product. Specifications that were evaluated include limit of detection, linearity, precision and percent recovery of spike in various matrices and several other specifications. Each of these tests showed the technology to perform well and that the technology to be a valid test in those types of water matrices. The report will be available on the US EPA website in January 2014. The following is a short summary of the results. Refer to the full ANDalyze US EPA ETV report for details.

### The purpose of the EPA ETV report

1. Detailed performance testing for: determination of the limit of detection, determination of linear range, determination of the effects of interferences in various synthetic matrices such as high total dissolved solids water, high iron containing water.
2. Testing accuracy and precision of the instrument for the analysis of **finished drinking water** samples (bottled water, municipal drinking water, and treated groundwater) , **environmental water** samples (surface water and groundwater), **wastewater** effluent samples (municipal wastewater effluent and metal finishing wastewater effluent) and qualitative performance for the analysis of seawater



### Results summary from the report

**Chapter 6 (Test results)** of the report has the detailed test results including all statistical analysis. *Table 7 through table 14* contains the summary that clearly shows the accuracy (as compared to the standard laboratory ICP-MS analysis method) and usefulness of the ANDalyze product for testing water for field (on-site) testing.

- US EPA reported that the **ease of use** of the ANDalyze sensor kit (Lead100/AND1000) was high.
- The **limit of detection** of the Lead100/AND1000 was calculated to be 1.534 µg/L Pb, which is below ANDalyze's specified detection limit. (*see section 6.4 of the report*) . This means that the US EPA has validated that the product works to the specified lower limit that ANDalyze has indicated.
- The **linearity** of detection was calculated in terms of slope as 0.8841, intercept as -0.8418, and the square of the correlation coefficient (r<sup>2</sup>) as 0.9927, . This means that over the stated testing range (ie. 2-100 PPB), the performance of the ANDalyze product is highly linear
- The **percent recovery** of spiked lead in various matrices was analyzed and is reported in *Table 7 – 13*. In most of the cases the recovery of the spike is within 75 – 125 %, demonstrating that the ANDalyze tests work very well for field testing of a variety of matrices. And that the US EPA validated that the ANDalyze specification of +/- 25% is an accurate specification for the product.
- **For detailed data related to percent recovery of spikes by ANDalyze tests and comparison to ICP-MS, see: Table 7 - Deionized water; Table 8 - Synthetic challenge matrices including high total dissolved solids water; Table 9 - Environmental water including ground water and surface water; Table 10 - Finished drinking**

water including tap water, bottled water; *Table 11* - Wastewater Effluent; *Table 13* - Seawater

- **Precision** - *Table 12* of the report shows precision calculated for all samples where triplicate measurement were taken. It compares the mean observation from ANDalyze tests to ICP-MS data and reports the standard deviation and coefficient of variation (CV). Majority of the samples had  $CV \leq 0.1$  with the maximum CV being 0.19, indicating that standard deviation of less than 20% from the mean should be expected in all matrices.
- **Summary Results** – The table below is extracted from *Table 12* of the report and summarizes the results from the US EPA ETV report. **The table shows that in all matrices the Mean Observation (using ANDalyze sensor) matches closely with the lead concentration measured with the standard laboratory technique, ICP-MS**

Water Sample Matrix	Expected Spiked Amount (mg/L Pb)	ICP-MS Concentration (mg/L Pb)	ANDalyze Mean Observation (mg/L Pb)
Deionized	25	27	20
Deionized	25	22	22
Deionized	5	5	4
Deionized	15	14	13
Deionized	25	29	20
Deionized	50	53	48
Deionized	75	83	76
Deionized	100	109	93
Low Total Dissolved Solids	25	25	22
Low Total Dissolved Solids	50	47	42
High Total Dissolved Solids	25	21	24
High Total Dissolved Solids	50	49	45
High Iron	25	22	21
High Iron	50	45	44
River Water	25	20	23
Reservoir Water	25	21	22
Raw Well Water Pretreated	25	21	35
Finished Well Water	25	24	21
Water Fountain	25	21	23
Bottled Water	25	20	18
Municipal Wastewater# 1	25	19	20
Municipal Wastewater# 2	25	20	26
Metal Finisher Effluent	25	24	22

Please contact ANDalyze if further information is needed regarding the US EPA ETV report.

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