

## A2LA Assessor Environmental Method Checklist

### ***Mercury - Cold Vapor Atomic Absorption Metho***

Item	Section 1 - Personnel	Reference	Yes-No or NA	
1.1	Does the analyst(s) interviewed meet the job description position requirements, training and qualifications for performing the test? Supervisor: _____ Technician: _____	(G25)6.1		

Item	Section 2 - Equipment & Facilities	Reference	Yes-No or NA	
2.1	Is an atomic absorption spectrometer or instrument designed for mercury using the cold vapor technique available for use with a mercury hollow cathode lamp or electrodeless discharge lamp?	(SW846)7470A,4.1 (9/94)		
2.2	Are a 10 cm long spectrophotometer cell, an air pump capable of delivering 1 liter air/minute and a flowmeter part of the apparatus?	(SW846)7470A,4.5-7 (9/94)		
2.3	Is the hot plate or equivalent capable of maintaining a temperature of 90-95°C ?	(SW846)7470A,4.10 (9/94)		
2.5	Is a water bath with a covered top and the capacity to maintain a water depth of 2 to 3 inches at 95°C available?	(ORDM)245.1,6.3 (5/94)		
2.4	Is a cold vapor generator available and is the mercury vapor vented or passed over an absorbing medium to avoid inhalation?	(SW846)7470A,4.9 (9/94)		

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Item	Section 3 - Method	Reference	Yes-No or NA	
3.1	Are the working standards prepared daily & maintained at 0.15% nitric acid acidity?	(SW846)7470A,5.10 (9/94)		
3.2	Are equal amounts of permanganates added to standards and blanks until the purple color persists for at least 15 minutes?	(SW846)7470A,7.1 (9/94)		
3.3	Are samples, standards and blanks heated for 2 hours in a water bath at 95°C?	(SW846)7470A,7.1 (9/94)		
3.4	Is the total volume for samples, standards and blanks 100 mL?	(SW846)7470A,7.2 (9/94)		
3.5	Are five standards and a blank performed at the start of each run?	(SW846)7470A,7.2 (9/94)		
3.6	Are concentrations reported appropriately for multiphased or wet samples as wet or dry weight?	(SW846)7470A,7.5 (9/94)		
3.7	Is the air flow optimized to 1 liter per minute prior to use and is the instrument and hollow cathode lamp allowed to warm-up for at least 15 minutes?	(ORDM)245.1,10.1 (5/94)		
3.8	Is the digestion vessel purged before addition of stannous chloride solution to remove interfering volatile materials such as chlorine?	(ORDM)245.1,4.2 (5/94)		
3.9	Is low level mercury preparation, digestion and analysis performed in areas with low backgrounds of mercury such as away from COD and TKN analysis?	(ORDM)245.1,4.3 (5/94)		
3.10	Is the linear dynamic range determined at least annually using a minimum of three different concentration standards across the range?	(ORDM)245.1,9.2.2 (5/94)		
3.11	Are triplicate 0.2 g portions of untreated solid samples placed in the bottom of a BOD bottle with 5 mL reagent water and 5 mL aqua regia and heated for 2 min at 95°C?	(SW846)7471A,7.1 (9/94)		
3.12	Are triplicate 0.2 g portions of untreated solid samples placed in a bottle with 5 mL sulfuric acid, 2 mL nitric acid and 5 mL permanganate solution, covered with aluminum foil and autoclaved at 121°C and 15 lb for 15 minutes?	(SW846)7471A,7.2 (9/94)		

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Item	Section 4 - Sample Handling Practices	Reference	Yes-No or NA	
4.1	Are sample containers either plastic or glass and are they prewashed with detergents, acids and reagent water?	(SW846)7470A.6.2 (9/94)		
4.2	Are aqueous samples acidified with nitric acid to pH < 2 and analyzed within 28 days of collection?	(SW846)7470A.6.3 (9/94)		
4.3	Are nonaqueous samples refrigerated when possible and analyzed as soon as possible?	(SW846)7470A.6.4 (9/94)		
4.4	Are sample devices, sample containers and plastic items determined to be free of mercury?	(ORDM)245.1.8.1 (5/94)		
4.5	Are samples preserved with (1+1) nitric acid to pH < 2 at the time of collection or shipped to the laboratory and preserved within two weeks of collection and analysis started only after being held preserved for 16 hours?	(ORDM)245.1.8.2 (5/94)		

Item	Section 5 - Quality Control Practices	Reference	Yes-No or NA	
5.1	Is a calibration check standard (made from a reference material or other independent standard material at or near the mid range) analyzed at the beginning (found to be within $\pm 10\%$ of the true value) and after every 10 samples (found to be within $\pm 20\%$ of the true value)?	(SW846)7000A.8.2 (7/92)		
5.2	Is at least one matrix spike and one matrix spike duplicate included in each batch?	(SW846)7000A.8.4 (7/92)		
5.3	Is at least one typical sample per analytical batch selected for serial dilution to determine if interferences are present?	(SW846)7000A.8.6 (7/92)		
5.4	Is a calibration blank, laboratory reagent blank and laboratory fortified blank performed with each analysis?	(ORDM)245.1.7.11 (5/94)		
5.5	Is the laboratory reagent blank analyzed with each batch of 20 or fewer samples and found to be less than 2.2 times the analyte's MDL or less than 10% of the analyte level determined for a sample?	(ORDM)245.1.9.3.1 (5/94)		
5.6	Is the laboratory fortified blank prepared at a concentration greater than ten times the MDL but less than the mid point concentration of the calibration curve?	(ORDM)245.1.7.11 (5/94)		
5.7	Is a laboratory fortified blank analyzed with each batch and is the recovery within $\pm 15\%$ of the analyte added to fortify the solution?	(ORDM)245.1.9.3.2 (5/94)		
5.8	Is a laboratory fortified matrix performed for a minimum of 10% of the routine samples and is the recovery $\pm 30\%$ ?	(ORDM)245.1.9.4.2 (5/94)		

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5.9	Is an instrument performance check solution analyzed at the beginning, end and every 10 samples and found to be within 5% of calibration at the start and within 10% of calibration during subsequent analysis?	(ORDM)245.1,7.12 (5/94)		
5.10	Is a quality control sample obtained from an outside source analyzed at least quarterly and is it found to be within $\pm 10\%$ of the stated values?	(ORDM)245.1,9.2.3 (5/94)		
5.11	Are the method detection limits determined annually or whenever a new operator begins work, using seven replicates at two to three times the estimated instrument detection limit?	(ORDM)245.1,9.2.4 (5/94)		