Method 0010

Method for Determining TCO/GRAV in Stack Gas

Sampling and Field Procedure for Semivolatile Total Chromatographable Organics (TCO) and GRAV as Unspeciated Mass in Stack Gas

Sample Name:	Modified Method 5 (MM-5) Semivolatile Total Chromatographable Organics and GRAV Sampling Train
Sampler:	Stack Sampling Engineer
Process Sample Location:	Stack Sampling Platform
Sampling & Health & Safety Equipment:	Sampling and safety equipment is as follows:

- U.S. EPA Method 0010 (MM-5) Sampling Train
- Organic-free DI water
- Aluminum foil
- 250 mL amber Boston Round - acetone probe rinse and the methylene chloride probe rinse
- Glass Petri Dish - particulate filter
- XAD-2 Resin Tube
- 250 mL amber Boston Round - backhalf rinse of the filter holder behind the particulate filter, coil condenser and connecting glassware with acetone and methylene chloride
- 1 Liter amber Boston Round (Note: a 1 gallon Wheaton® jug with a Teflon®-lined lid may be used if a large volume of condensate is expected) - condensate and impinger contents of impingers #1, #2, and #3
- 250 mL amber Boston Round - acetone and methylene chloride rinse of the impingers and connecting glassware
- Squirt bottles for acetone and methylene chloride
- Graduated cylinder
- Safety glasses or face shield
- Gloves and other safety equipment as required

Sample Collection Frequency:	Continuously for approximately 4 hours until at least 3 m^3 of stack sample is collected for each run; sampling rate will be ±0.75 m^3 per hour. Three runs will constitute a test.

Sampling Procedures:

XAD-2 Tube Preparation - The laboratory will prepare the XAD-2 resin tubes and deliver them to the sampling team for use during the project. The procedures for preparing, handling, storing, and analyzing the tubes are those described in the U.S. EPA SW-846 Methods 0010 referenced below. Pre-cleaned XAD-2 resin is commercially available (Supelco® or Restek®) and will be used to prepare the resin tubes. Two XAD-2 resin tubes using the purchased resin will be spiked with surrogates and internal standards and analyzed as laboratory resin blanks (Spiked Resin Blanks) to confirm that the resin is free from significant background contamination and to assess the recovery capabilities of the analytes from the resin batch.

For storage and transport to the field, the resin tubes will have their ends sealed with Teflon® tape, wrapped in aluminum foil, sealed in Ziploc® bags, and packed in a clean sample cooler. In the field, the cooler will be stored in the sample recovery trailer and resin tubes are removed only when ready for labeling and installation in the sampling train.

Before each sampling run, the Sampling Coordinator will supply a XAD-2 resin tube and a field blank tube to the Stack Sampling Engineer who will direct the operation of the MM-5 train. At the end of each run, the Sample Coordinator will recover the resin tubes and other train components and complete the preparation of the sample documentation. The MM-5 stack samples will be stored on ice at approximately 4^{o}C in insulated coolers in a storage area away from sources of fugitive contamination.

MM-5 Train Operation - The MM-5 train components will be provided by the Stack Sampling team. With the exception of the necessary modification for installing and recovering the resin tubes, the sampling procedures will be as specified in U.S. EPA Methods 1 and 2 for stack flow measurements, and Method 4 and 5 for moisture content and particulate. An initial traverse is made with a pitot tube at each sample point following U.S. EPA Methods 1 and 2 to establish the stack velocity profile, temperature, and flow rate, and to check for cyclonic air flow. Sample point location will be in accordance with U.S. EPA Method 1. The sampling team will record the data as recommended in Method 5.

The sampling equipment will be calibrated before and after the test. The pretest calibrations will be available for agency review before testing commences.

The first impinger (Impinger #1) will be an empty condensate knockout impinger. The MM-5 train will be charged with 100 ml of organic-free DI water in the second (Impinger #2) and third (Impinger #3) impingers. The fourth impinger will contain indicating silica gel which is tare weighed to the nearest 0.5 gram.

The sampling train will be leak tested according to U.S. EPA Method 5 protocols. A Teflon® plug or a sampler's thumb covered with Teflon® tape will be placed over the end of the nozzle to ensure that no contaminants are transferred to the train during nozzle leak checks.

MM-5 Train Sample Recovery - The six (6) sample fractions that will be separately recovered from the MM-5 train are as follows:

- Particulate Filter - Will be removed from its holder and carefully placed in its original, labeled Petri dish, sealed with Teflon® tape, and sealed in a Ziploc® plastic bag for shipment to the laboratory.

- Solvent Probe Rinses - The nozzle, probe, the front-half of the filter holder will be brushed and rinsed three times with acetone followed by brushing and rinsing three times with methylene chloride. The rinses will be combined and placed in a 250 mL amber labeled Boston Round sample collection bottle with a Teflon®-lined lid.

- XAD-2 Resin Tube - The XAD-2 resin tube will be removed from the sampling train, its ends capped or sealed with Teflon® tape, wrapped in aluminum foil, sealed in a Ziploc® bag, and stored on ice for shipment to the laboratory.

- Back half of the Filter Holder and Coil Condenser solvent glassware rinses - The back half of the filter holder, coil condenser, and connecting glassware will be rinsed three times with acetone and methylene chloride. The rinses will be combined and placed in a 250 mL amber Boston Round sample bottle with Teflon®-lined lid.

- Condensate (Impinger #1) and Impinger Contents of Impingers #2 and #3 - The aqueous contents of each individual impinger (1-3) will be volumetrically measured to the nearest milliliter, recorded separately for moisture calculations, and then combined into a 1 Liter amber Boston Round (Note: a 1 gallon Wheaton jug with a Teflon®-lined lid may be used if a large volume of condensate is expected). All three impingers and connecting glassware are rinsed three times with DI water. The rinses are then added to the sample bottle.

- Condensate and Impinger Contents of Impingers #2 and #3 Solvent Glassware Rinses - Rinse Impingers #1 - #3 three times with acetone followed by three times with methylene chloride. Place these solvent rinses in a separate labeled sample collection bottle with a Teflon®-lined lid.

- Silica Gel - The silica gel impinger will be reweighed to the nearest 0.5 gram and the weight gain is calculated as moisture gain in the train.

All of the MM-5 sample components will be assigned unique sample tracking numbers and labeled with date and test run number. The samples will be recovered by the Sample Coordinator and the Stack Sampling Engineer and the sample collection documentation will be recorded. The Sample Coordinator will record the appropriate data in the field log book and pack the samples on ice in a storage cooler.

Quality Assurance:

A complete MM-5 blank train will be prepared once during the test burn series, set up near the base of the stack in a manner similar to the actual MM-5 sampling train and applying an equivalent number of associated leak checks. It is required that the blank train be set up during one of the actual TCO/GRAV

sampling runs. The train will remain sealed with the filter holder and probe heated to their standard operating temperature at that location for a time period equivalent to one test run. The blank train samples will be recovered using the same procedures described above for the actual train samples.

An XAD-2 resin field blank will be opened at the location of train assembly one time during the test. The XAD-2 should remain open for the duration of actual train assembly. An XAD-2 trip blank for TCO/GRAV should accompany each Method 0010 shipment of samples to the laboratory.

Two spiked resin blanks of the XAD-2 resin are to be prepared at the time or resin tube preparation and analyzed with the field samples.

Liquid samples will have the liquid levels clearly marked on the sample bottles to display the final sample contents level.

Sample Preservation:

The holding times for the TCO/GRAV samples is 14 days to extraction from the time of collection and analyses within 30 days of extraction. All samples should be preserved on ice at approximately 4°C ±2°C.

Method References:

Method 3542 - "Extraction of Semivolatile Analytes Collected Using Method 0010 ("Modified Method 5 Sampling Train")". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 0010 - "Modified Method 5 Sampling Train". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 5, Appendix A, Test Methods and Procedures, New Source Performance Standards, 40 CFR 60.

Guidance for Total Organics - Final Report, EPA/600/R-96/033, March 1996.

Analysis of Semivolatile Total Chromatographable Organics (TCO) and Non-Volatile Organics (GRAV) in MM-5 Train Samples

Sample Name:

MM-5 Train for the collection of Semivolatile Total Chromatographable Organics (TCO) and Non-Volatile Organics (GRAV)

The actual sample names given to fractions derived from the MM-5 Train are:

- Front Half Composite - Particulate filter and the front half of the filter holder, probe and nozzle solvent rinses (Figure 1)
- Back Half Composite - XAD-2 resin tube and the back half of the filter holder and coil condenser solvent rinses (Figure 2)
- Condensate Composite - Condensate and impinger composite, and glassware solvent rinses (Figure 3).

Sample Holding Time:

Analysis Procedures:

~~Extract within 14 days~~ of sample collection, and analyze within 40 days from extraction date.

Front Half Composite
Place solvent probe and nozzle rinse, particulate filter and front half of the filter holder rinses into a Soxhlet extractor. Add semivolatile TCO/GRAV surrogate compounds onto the filter portion prior to extraction. Extract for 18 hours using methylene chloride.

Concentrate extract to 10 ml. Divide the extract 50:50 for TCO, and the second portion for GRAV.

Add semivolatile TCO internal standards to the appropriate extract portion and analyze by Method 8015B for semivolatile TCO. The second portion will receive a residue analysis by gravimetric determination.

Back Half Composite
Place Backhalf of the Filter Holder and Coil Condenser Solvent Rinses into a Soxhlet extractor. Add semivolatile TCO/GRAV surrogate compounds. Extract for 18 hours using methylene chloride.

Concentrate extract to 10 ml. Divide the extract 50:50 for TCO, and the second portion for GRAV.

Add semivolatile TCO/GRAV internal standards to the appropriate extract portions, and analyze by Method 8015B for semivolatile TCO. The second portion will receive a residue analysis by gravimetric determination.

Condensate Composite
Place a one liter portion of the sample in a separatory funnel and add the semivolatile TCO surrogate compounds onto the sample. Perform a liquid-liquid extraction using Method 3510. Concentrate the extract to 10 mL followed by a splitting of the sample 50:50 for TCO and a second portion for GRAV.

Add semivolatile TCO internal standards to the appropriate extract and analyze by Method 8015B for semivolatile TCO.

Method References:

Method 3510 - "Separatory Funnel Liquid-Liquid Extraction". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 3540 - "Soxhlet Extraction". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 3542 - "Extraction of Semivolatile Analytes Collected Using Method 0010 (Modified Method 5 Sampling Train)". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 8015 - "Nonhalogenated Organics Using GC/FID". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

Method 160.3 - Residue, Total (Gravimetric, Dried at 103^{o}C to 105^{o}C). EPA 600 - Method 160. Taken from Methods for Chemical Analysis of Water and Waste. EPA-600/4-79-020. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH, 1979

Figure 1. MM-5 Train Sample Handling and Extract Splitting Scheme for the Particulate Filter and Front Half of the Filter Holder and Probe Solvent Rinses (Semivolatile and Non-Volatile Unspeciated Mass Analysis)

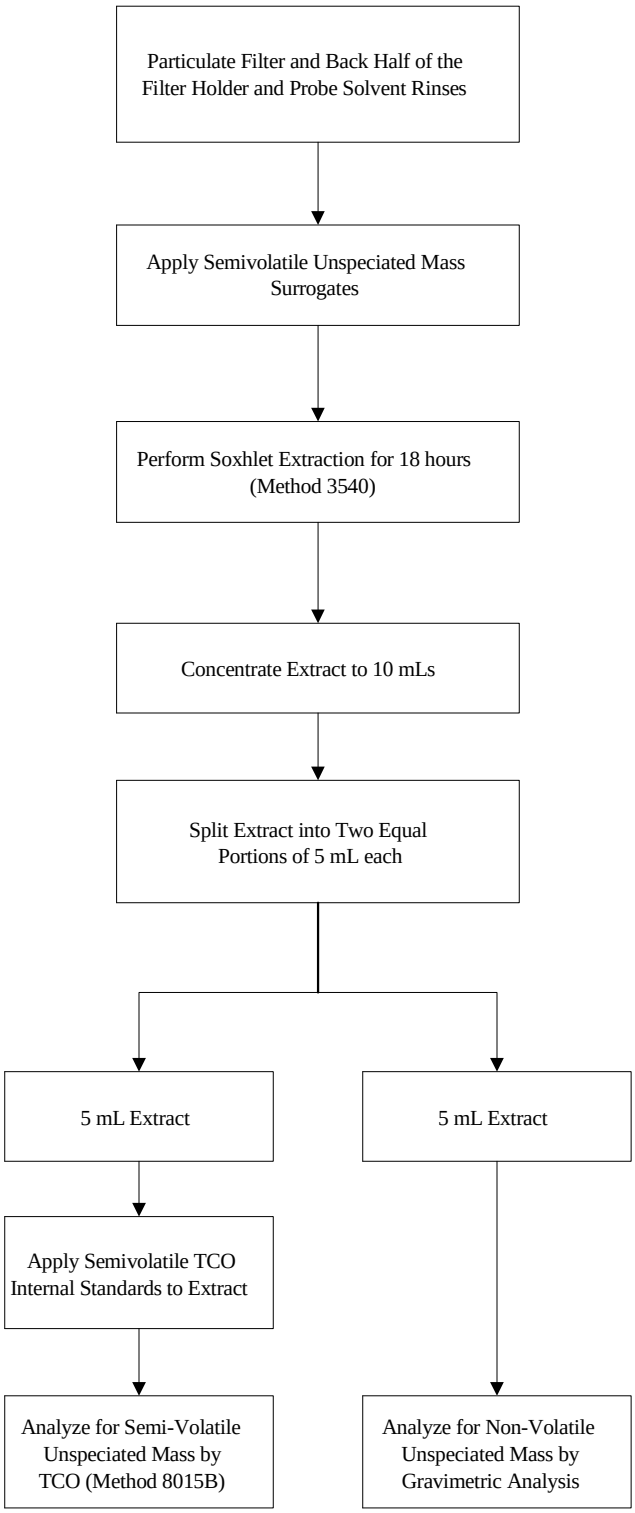
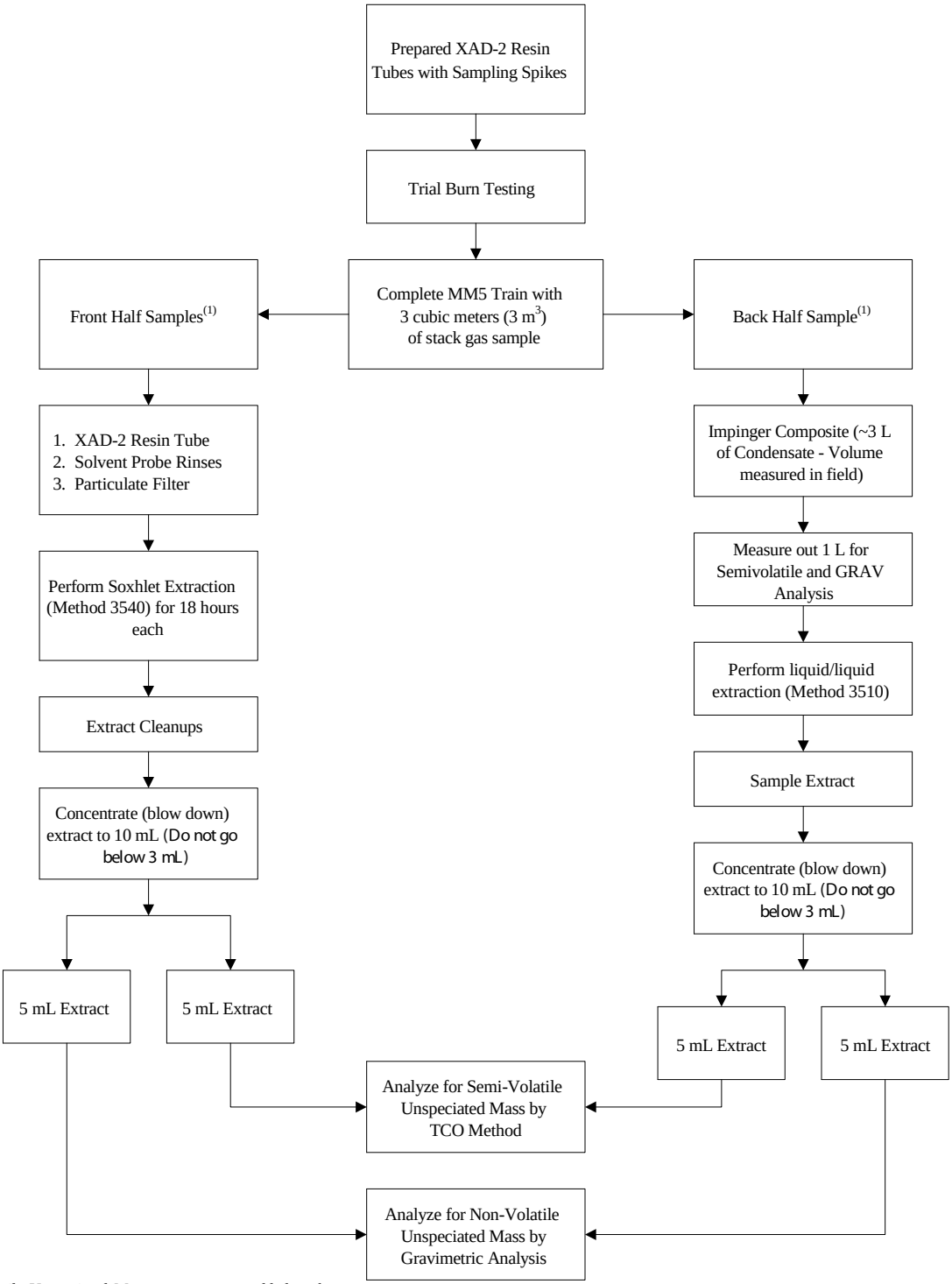
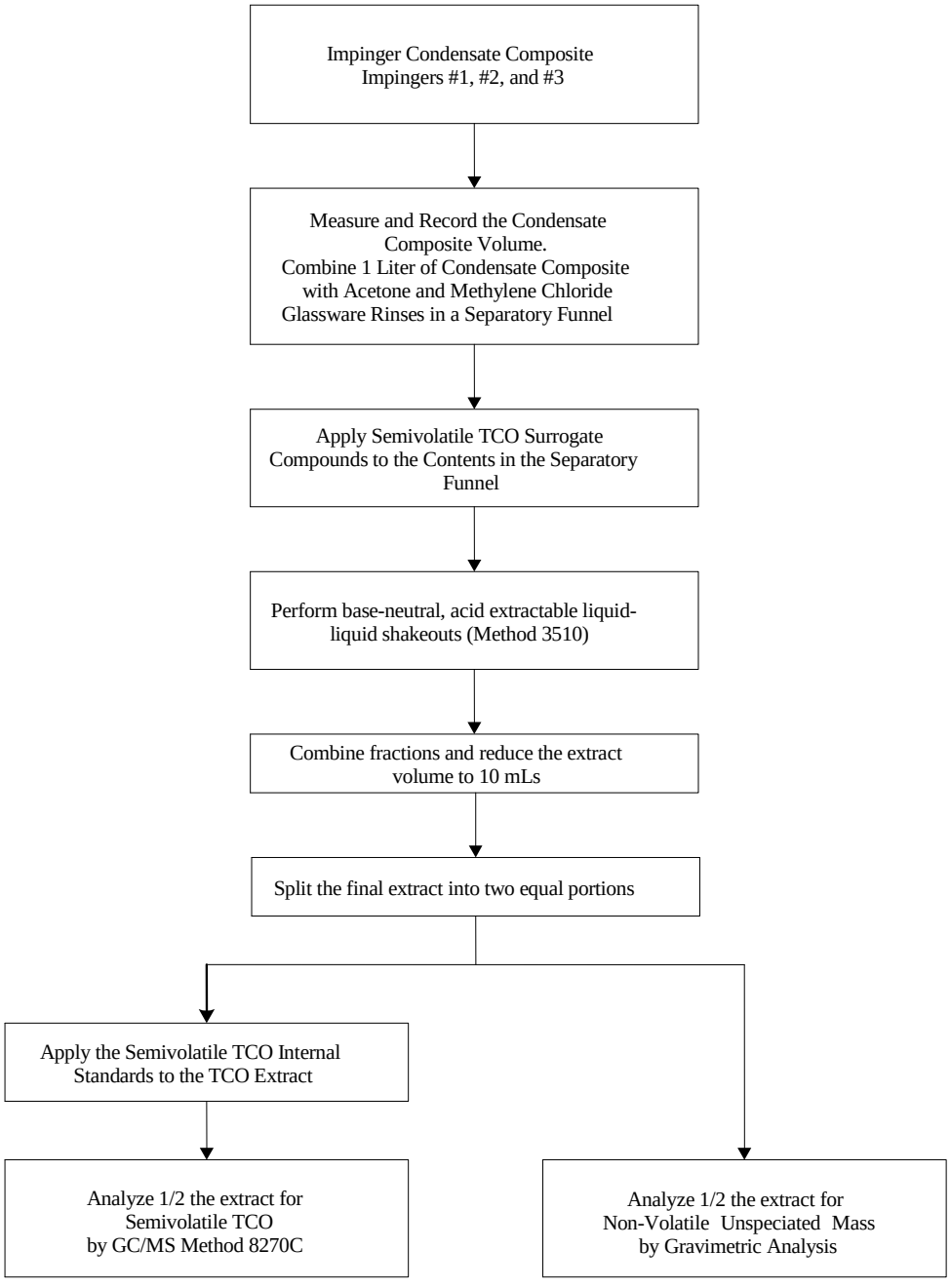


Figure 2. MM-5 Train Sample Handling and Extract Splitting Scheme for the XAD-2 Resin Tube and the Back Half of the Filter Holder and Coil Condenser Solvent Rinses (Semi-Volatile and Non-Volatile Unspeciated Mass Analysis)



(1) Semivolatile Unspeciated Mass surrogates are added to the front half and to the back half samples immediately before solvent extraction is performed.

Figure 3. MM5 Train Sample Handling Scheme for the Impingers #1, #2, and #3 Condensate Composite and Glassware Solvent Rinses (Semivolatile and Non-Volatile Unspeciated Mass)



Method 0040 for Volatile Total Organics as Unspeciated Mass in Stack Gas Emissions

SAMPLE PRESERVATION AND HOLDING TIMES

All samples requiring refrigeration should be placed on ice (when required for preservation) in coolers during and after sampling and will be stored at a temperature of approximately 4°C until analyzed. In addition to cooling all samples that require low temperature preservation, chemical preservatives should be used, as required, in samples for specific analyses according to EPA protocols. The holding times and preservation techniques are either those recommended in Title 40 CFR Section 136.3, Table 11, "Required Containers, Preservation Techniques, and Holding Times," or those presented by EPA in Table 3-1 of the *Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration* (EPA-625/6-89-023).

Measurement	Matrix	Preservation[a]	Holding Time[b]
Volatiles (including unspeciated mass)	Tedlar® bags	Do not chill, Warm to ~60°C	6 hours
	Condensate and aqueous liquid samples	Chill with ice 4 °C ± 2°C, 0.008% $Na_2S_2O_3$	14 days to analysis

Notes:

[a] CPT samples requiring refrigeration will be preserved on ice from the time of collection through delivery to the analytical laboratory.

[b] Holding times are calculated from the date of collection.

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Method 0040 for Volatile Total Organics as Unspeciated Mass in Stack Gas Emissions

Recommended Quality Measurements for a 3 Run CPT

Analytical Parameter (Analysis)	Sample Name or Type	Total No. of Field Samples	Analytical Procedure Description (Method)	Laboratory QC Measurement Type	Frequency of Applied QC Measurement Type	Total No. of Laboratory QC Measurements	Field QC Measurement Type	Total No. of Field QC Samples	Total No. of Laboratory Analyses[a]
Volatile Unspeciated Mass (Carbon-1 through Carbon-7)	Method 0040 Tedlar® Bags	3	GC/FID (Modified SW-0040), SW-8015B	Field Spikes	Two field spikes per test condition	2 bags per test condition	Train blank	1 bag	7
				Duplicate Analyses	Every Tedlar® bag	7	Trip blank	1 bag	
	Method 0040 Condensate	3	Purge and trap GC/FID (SW-5030B, SW-0040, SW-8015B)	Matrix Spike	One blank spike and blank spike duplicate per test condition	2	Trip blank	1	7
							Train blank	1	

[a] Total laboratory analyses includes all field samples collected and all laboratory and field QC samples that are analyzed. This number may not be calculated easily by adding the totals from the columns above; however, the total number presented represents the required total analyses for the sample and quality assurance analytical program.

[b] Surrogate spikes will be applied to all samples including matrix spikes, duplicates, and blank analytical aliquots.

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Recommended Analytical Quality Control Checks, Frequencies, Target Acceptance Criteria, and Corrective Action

Parameter/Method	QC Check	Frequency	Target Criteria	Corrective Action
Tedlar® Bag Samples for Total Organics (Method SW-0040 and Guidance for Total Organics)	Initial Calibration (minimum five (5) standards in duplicate)	Prior to analysis	Precision of duplicate standards as %Difference • %D ≤ 5% Fit of standard curve • Correlation coefficient ≥ 0.995	(1) Correct problem (2) Repeat initial calibration
	Continuing Calibration Verification (CCV) standards in duplicate	Daily, and after every ten (10) samples	Accuracy • %Recovery: 90 – 110% Precision of duplicate standards as %Difference • %D ≤ 5%	(1) Recalibrate instrument (2) Reanalyze affected samples if possible, or flag data and discuss in final report
	Laboratory Method Blank	Once per sample batch (maximum 20 samples)	Target analyte concentrations • Concentrations < Reporting Limit (RL)	(1) Flag data associated with method blanks (2) Discuss in final report
	Field Spike/ Field Spike Duplicate (FS/FSD)	Once per test series (maximum 20 samples)	Accuracy • %Recovery: 70 – 130% Precision (if applicable) • RPD ≤ 35%	(1) Flag FS/FSD data (2) Discuss in final report

Parameter/Method	QC Check	Frequency	Target Criteria	Corrective Action
Volatile Condensates for Total Organics (Methods SW-0040 and Modified SW-8015B, Guidance for Total Organics)	Initial Calibration (minimum five (5) standards)	Prior to analysis	Fit of standard curve • Correlation coefficient ≥ 0.995	(1) Correct problem (2) Repeat initial calibration
	Continuing Calibration Verification (CCV)	Daily, and after every ten (10) samples	Accuracy • %Recovery: 85 – 115%	(1) Repeat CCV (2) If still unacceptable, recalibrate instrument (3) Reanalyze affected samples
	Laboratory Method Blank	Once per sample batch (maximum 20 samples)	Target analyte concentrations • Concentrations < Reporting Limit (RL)	(3) Flag data associated with method blanks (4) Discuss in final report
	Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)	Once per digestion batch (maximum 20 samples)	Accuracy • %Recovery: 70 – 130% Precision (if applicable) • RPD ≤ 35%	(1) Flag data (2) Discuss in final report

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SUMMARY OF FIELD QUALITY CONTROL SAMPLE REQUIREMENTS COMPREHENSIVE PERFORMANCE TEST - 3 RUNS

Sample	QC Sample Type	Frequency	QC Sample Total
Volatile Unspeciated Mass (Method 0040)	Train Blanks	One per test condition	1
	Trip Blanks	One per test condition	1
	Condensate Trip Blank	One per sample shipment	1
	Field Spike/Field Spike Duplicate	One set per test condition	2

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Method 0040 for Volatile Total Organics as Unspeciated Mass in Stack Gas Emissions

Sampling and Field Procedure for Volatile Unspeciated Mass from Method 0040 Samples in Stack Gas

Sample Name:	Stack Gas Volatile Unspeciated Mass
Sampler:	Stack sampling specialists
Process Sample Location:	Stack Port
Sampling & Health & Safety Equipment:	Sampling and safety equipment is as follows: ▪ Tedlar® gas bags ▪ Stack gas metering pump ▪ Heated stack probe and condensate traps ▪ "Lung Sampler" for bag sampling operation ▪ Glass 40 ml volatile organic analysis (VOA) vials with screw-top caps and Teflon®-lined septa ▪ Safety glasses or face shield ▪ Gloves and other safety equipment as required
Sample Collection Frequency:	Continually integrated sample collected for approximately three (3) hours from the stack for each integrated sampling run.
Sampling Procedures:	Collect an integrated sample of approximately 30 liters in a clean, new Tedlar® bag using an appropriate sampling rate. A standard Method 0040 stack gas sampling train is assembled and leak checked at the stack sampling location. A new 40 liter Tedlar® Bag is placed in the sampling chamber and an initial leak check of the sampling system is conducted. Ice water is circulated through the gas sample condenser, and the condensate trap is submerged into the system ice bath. The ice bath will be maintained at approximately 4°C. The sampling rate will be maintained for a total sampling volume of approximately 30 liters. The collected bag sample is to represent an integrated stack gas collection being taken for a minimum of a two (2) hour period, and up to three (3) hours while the companion organics trains (i.e. semivolatiles, PAHs, volatiles, dioxin and furans) are being operated. When the final sample volume is achieved, a final leak check of the train will be performed and the train will be prepared for sample retrieval from the train.

Volatile Condensate Handling - The condensate trap will be removed from the sampling train and its aqueous contents will be transferred to either a 20 mL or a 40 mL VOA vial, whichever is appropriate in terms of volume and requiring the least amount of organic-free water to top off the vial, and provide a zero headspace volatiles sample.

Sample Preservation:

Tedlar® Bag Sample Preservation and Handling - The Tedlar® Bag is stored in a Coleman type "cooler" equipped with an adjustable heat source. The bag should be stored in the heated storage chest at approximately 60°C. Bags will be stored in the dark and will not be allowed to chill at any time. The holding time for volatile unspeciated mass bag samples is six (6) hours.

Volatile Unspeciated Mass Condensates will be stored on ice at approximately 4°C until analyzed at the performing laboratory. The holding time for condensates is 14 days from collection. Sodium Thiosulfate ($Na_2S_2O_3$) should be added to the condensate samples as a preservative against residual chlorine. A 0.008% solution of $Na_2S_2O_3$ should be used.

Quality Assurance:

One (1) Tedlar® bag will be collected from each run. All sample analyses will be analyzed in duplicate and the average result used for the final result. One (1) train blank and one trip blank will be collected for each test condition. A field spike and a field spike duplicate will be prepared and analyzed for each test condition.

A D.I. water condensate rinse will be collected with the train blank, and a D.I. water trip blank will be collected one time during each test condition. Tedlar® bags may not be reused after the introduction of stack gas. Unused bags are required, and all bags are required to be tested for leaks and background contamination.

Method References:

Method 0040 - Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags. Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.

EPA Guidance for Total Organics, Second Edition, Draft (EPA Report Number and Publication Date were not identified on the draft report): Appendix E: "EPA Revised Method 0040 - Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags".

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Analysis Procedure for Volatile Unspeciated Mass from Method 0040 Samples in Stack Gas

Sample Name (Matrix):	Volatile Unspeciated Mass (Carbon 1 - Carbon 7) Method 0040 Tedlar® Bags Method 0040 Condensates
Sample Holding Times:	Tedlar® Bags - 6 hours Condensates - 14 days
Analysis Procedures:	A GC equipped with an FID detector is set up at the CPT test site for the analysis of the Tedlar® bag samples. Calibration is completed using methane through heptane standards. Bag samples are introduced into the gas sample bags followed by introduction into the column. The total unspeciated mass is calculated relative to propane (C-3) and reported as propane. Condensate samples are analyzed at the fixed base laboratory by direct injection on a GC equipped with an FID.
Method References:	Method 0040 - "Sampling of Principle Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460. Method 5030B - "Purge and Trap for Aqueous Samples". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460. Method 8015B - "Nonhalogenated Organics Using GC/FID". Taken from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Third Edition, September 1986. Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), Final Update III (December 1996), and Final Update IIIA (April 1998). USEPA, OSWER, Washington, D.C. 20460.