PROJECT SPECIFIC STANDARD OPERATING PROCEDURE – EAST HENNEPIN AVENUE STUDY AREA

Air Sample Collection from a Sub-Slab Soil Vapor Monitoring Point

Revision 1

November 6, 2013

Approved By:

Print	QA Manager(s)	Signature	Date

Print	Field Technician(s)	Signature	Date

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Annual Review of the SOP has been performed and the SOP still reflects current practice.

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Standard Operating Procedures for the Air Sample Collection from a Sub-Slab Soil Vapor Monitoring Point

Purpose

To describe the procedure for collecting an active air sample for laboratory analysis using Summa canisters from sub-slab soil vapor monitoring points.

Applicability

The procedure applies to collection of an air sample in a Summa canister from a sub-slab soil vapor monitoring point. The term "Summa" Canister is a generalized trademark that refers to electropolished, passivated stainless steel vacuum sampling devices, such as TO canisters, SilcoCans, MiniCans, etc., which are cleaned, evacuated, and used to collect whole-air samples for laboratory analysis.

Equipment

a) Summa canister with a Swagelok or Entech male quick connect fitting (provided by laboratory).

b) 7 micron particulate filter (provided by laboratory)

c) Pressure Gauge (provided by laboratory)

d) Flow controlling device (provided by the laboratory)

e) Entech male and female quick connect fittings

f) Small diameter Teflon tubing with a Swagelok compression fitting/nut on one end

g) Surgical grade silicone tubing

h) Small diameter Swagelok plug valve and associated ferrules, nuts and fittings

i) 9/16-inch wrench

j) Surgical grade graduated syringe with female Luer lock type connection, 60 mL

k) Surgical grade Luer lock valve

l) Cable tie

m) Photo-Ionization Detector (PID) equipped with an 11.7 or 11.8 eV bulb

n) Chain of custody, and dedicated field logbook and/or sampling forms as required

References

Cox-Colvin & Associates, Inc., Standard Operating Procedure Installation and Extraction of the Vapor Pin™. May 20, 2011

Cox-Colvin & Associates, Inc., Standard Operating Procedure Use of the Vapor Pin™ Drilling Guide and Secure Cover. July 16, 2012

Air Toxics Ltd, Guide to Air Sampling and Analysis, Canisters and Tedlar Bags Fifth Edition

Responsibilities

The Field Technician(s) are responsible for collection of the air sample using a Summa canister.

Procedure

The following procedure includes purging a sub-slab soil vapor monitoring point, conducting a vacuum based leak test on the sampling train, and collecting a sub-slab soil vapor sample in a Summa canister.

Purging requirements may vary based on site conditions or project requirements, but will be a minimum of two times the volume of the sub-slab soil vapor monitoring point and the associated tubing and sampling train.

If the construction of the sub-slab soil vapor monitoring point included the use of a Vapor Pin™ device then attachment to the sub-slab soil vapor monitoring points shall be completed in general accordance with Standard Operating Procedure Installation and Extraction of the Vapor Pin™ and/or Standard Operating Procedure Use of the Vapor Pin™ Drilling Guide and Secure Cover. This method in general will incorporate the use of disposable small diameter PTFE (Teflon) tubing, a Swagelok plug valve, and the pressure gauge assembly supplied by the analytical laboratory. Brass or stainless steel Swagelok valves and/or fittings may also be used.

The sub-slab soil vapor monitoring point will be installed. The Teflon tubing is attached to the sub-slab soil vapor monitoring point. A single or a series of brass or stainless steel Swagelok valves and fittings is utilized to minimize the sub-slab soil vapor source's exposure to ambient atmosphere. The Teflon source tubing is then connected to the single or series of brass or stainless steel Swagelok valves and fittings. After connection of the source Teflon tubing, proceed with operational procedures described below.

The Teflon tubing will be discarded upon completion of sample collection. The sampling train should be decontaminated in by purging with ambient air for approximately five minutes at a rate of 200 mL per minute or greater.

1. Performing the Vacuum Based Leak Test

[Note: In this standard operating procedure if Vapor Pins™ are used, vacuum based leak testing should be performed in conjunction with water based leak testing described in Standard Operating Procedure Installation and Extraction of the Vapor Pin™ The analytical testing laboratories may supply the particulate filter, flow controlling device, vacuum gauge, and Teflon tubing with compression fitting as one assembly (Flow Control Assembly). In

addition, the Summa canisters may be fitted with a quick connect which will connect to the Sample Assembly. Alternate configurations may need to be assembled for collection of Summa canister data and/or successful sample collection.]

a. Connect the Luer lock valve to the male Swagelok threaded end of the Entech quick connect fitting (or other fitting as appropriate) with a short section of Teflon tubing fit inside surgical grade silicone tubing. Secure the silicon tubing to both fittings with a cable tie.
b. Connect the Luer lock valve to the syringe to complete the assembly (Purge Assembly).
c. Disconnect the laboratory supplied Teflon tubing (if present) from the Flow Control Assembly and insert the Swagelok plug valve between the tubing and particulate filter. Tighten the fittings on either side of the valve by turning approximately 1/8 turn past finger tight.

d. Connect one end of a short section (approximately 1 foot) of new Teflon tubing to the hose barb fitting of the sub-slab soil vapor monitoring point. Connect the other end to the Flow Control Assembly

e. Connect the male quick connect fitting (or other fitting as appropriate) on the Purge Assembly to the female quick connect fitting (or other fitting as appropriate) on the Flow Control Assembly.
f. Close the Swagelok plug valve(s).
g. Engage the Purge Assembly and draw back the syringe plunger until the pressure gauge indicates a vacuum of approximately 20-25 inches of Hg has developed in the sampling train.
h. While maintaining the syringe plunger position, quickly close the Luer lock valve and disconnect the Entech quick connect fitting (or other fitting as appropriate).
i. Although the vacuum in the sampling train may drop slightly while disconnecting the Entech quick connect fitting (or other fitting as appropriate), the vacuum should remain stable for a minimum of five minutes. If the vacuum, as indicated by the pressure gauge, drops then there is a leak in the sampling train.
j. If a leak is detected, tighten all fittings in the sampling train and repeat steps f through j.

2. Purging the Monitoring Point

a. Connect all portions of the sampling train by following steps a through e in Part 1.

b. Connect the male quick connect fitting (or other fitting as appropriate) on the Purge Assembly to the female quick connect fitting (or other fitting as appropriate) on the Flow Control Assembly.

c. While the Luer lock valve and Swagelok plug valve(s) are in the open position, slowly draw back the syringe plunger until the syringe plunger's indicator is to the 60 mL mark. Be sure to maintain the vacuum in the sampling train under 10 inches of Hg, as indicated by the pressure gauge, while drawing back the syringe plunger.

d. Close the Luer lock valve.

e. Disconnect the Luer lock valve from the syringe and purge the syringe contents to the atmosphere and away from other personnel.

f. Reconnect the Luer lock valve to the syringe and repeat steps f through h until the desired purge volume has been removed.

3. Summa canister sample collection

a. After leak testing is complete and with the Entech quick connect (or other fitting as appropriate) disconnected, open the Swagelok plug valve connected to the Teflon source tubing to relieve the vacuum in the sampling train. If a Flow Control Assembly is used, record the unique identifier number assigned by the laboratory (if present) on the chain of custody form and in/on the dedicated field book or sampling form.
b. Close the Swagelok plug valve.
c. Connect the Summa canister to the Entech quick connect fitting (or other fitting as appropriate). Once connected the pressure gauge should indicate the initial vacuum in the Summa canister.
d. Record the initial vacuum on the chain of custody form and in/on a dedicated field logbook or sampling form.
e. When ready, open the Swagelok plug valve to begin sample collection. Record the "start" time when the Swagelok plug valve was opened.
f. Monitor the vacuum in the Summa canister by watching and periodically tapping the pressure gauge in case of a "sticky" pressure indicator needle.
g. When the pressure gauge indicates that there is approximately three inches of Hg of vacuum in the Summa canister close the Swagelok plug valve.
h. Record the "stop" time and "final" vacuum on the chain of custody form and in/on a dedicated field book or sampling form.
i. Disconnect the Entech quick connect fitting (or other fitting as appropriate).
j. Disconnect the Teflon tubing from the Swagelok plug valve and quickly insert the tip of the PID.
k. Record the highest reading on the PID over a 30 second screening period.
l. Transfer the sample time (i.e. the stop time), the PID reading, the sample ID and the date to the Summa canister tag.

Sample Care and Documentation

1. Summa canister sample

The Environmental Technician should record on the Summa canister tag and in/on a dedicated field logbook or sampling form: the unique serial number of the Summa canister, the sample name, the time of sample collection, gauge pressure prior to collection, and gauge pressure following collection. The start and stop time of sample collection should also be recorded if using a flow controlling device. This information should also be reflected on the chain of custody when shipping samples to the laboratory.

Interferences/Discussion for Summa canister

Samples collected in a Summa canister should be shipped or stored at ambient temperature and kept out of direct sunlight.

2. Sample Storage

The Summa canisters must be stored at ambient temperature until receipt at the laboratory. All samples will be kept secured to prevent tampering. If samples are left in a vehicle or field office for temporary storage, the area will be locked and secured. The samples may be packaged into cardboard boxes and must be delivered to the laboratory via hand or overnight delivery courier in accordance with all Federal, State and Local shipping regulations.

3. Documentation

The Environmental Technician should record the following on the Summa canister tag, dedicated field logbook or sampling form, and chain of custody form as required:

Summa canisters:

1. unique serial number or identifier of the Summa canister
2. unique serial number or identifier of the vacuum gauge and particulate filter
3. unique serial number or identifier of the flow controlling devise
4. date and time of sample collection
5. gauge pressure prior to collection
6. gauge pressure following collection
7. sample identification
8. start and stop time of sample collection if using a flow controlling devise
9. name of sample technician

Attachments

Attachment 1: Chain of Custody Form
Attachment 2: Custody Seal – if applicable
Attachment 3: Field Sampling Quality Control Check List

Attachment 1
Chain of Custody Form

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number:

Project Name:

Sample Origination State __ __ (use two letter postal state abbreviation)

COC Number:

Number of Containers/Preservative

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	Soil: GRO, BTEX (tared MeOH) #1	Soil: DRO (tared unpreserved)	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Total Number Of Containers
1.																								
2.																								
3.																								
4.																								
5.																								
6.																								
7.																								
8.																								
9.																								
10.																								

COC _____ of _____

Project Manager: _____

Project QC Contact: _____

Sampled by: _____

Laboratory: _____

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

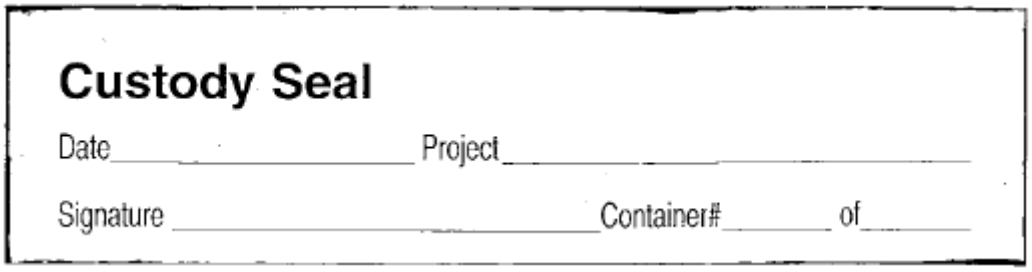
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:RLG\STDFORM\S\Chain Of Custody Form 2009 RLG Rev. 09/01/09

Attachment 2
Custody Seal – if applicable



Attachment 3
Field Sampling Quality Control Check List

☐ Sub-slab soil vapor monitoring point purging was completed.

Volume purged:_____

☐ Vacuum based leak testing was performed. Vacuum:_____ Duration:_____

☐ Water based leak testing was performed.

☐ PID screening was performed. Reading:_____

☐ Sample information was added to the chain of custody form.