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Environmental Programs Directorate

Standard Operating Procedure for:

Analytical Chemistry Analysis of Air Filters During an Emergency Event

APPROVAL SIGNATURES:

Subject Matter Expert:	**Organization**	**Signature**	**Date**
Jean Dewart	WES-EDA	Signature on File	12/3/2008
Quality Assurance Specialist:	**Organization**	**Signature**	**Date**
Laura Ortega	QA-IQ	Signature on File	1/9/2009
Responsible Line/Manager:	**Organization**	**Signature**	**Date**
Craig Eberhart	WES-EDA	Signature on File	1/8/2009

1.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) provides the steps/information to review prior to sending an air filter to the analytical chemistry laboratory for analysis during an emergency event. Because each emergency will be different, all specific steps will not be implemented identically for each emergency. These steps and information will assist the WES-EDA personnel in requesting the most appropriate analyses during an emergency event. This procedure integrates the criteria of the Quality Assurance Plan for the Environmental Programs, hereinafter referred to as the Quality Assurance Plan.

All **WES-EDA participants** shall implement this procedure submitting air filters for analysis by the analytical chemistry laboratory during an emergency event.

2.0 BACKGROUND AND PRECAUTIONS

2.1 Background

This procedure is used for emergency analyses of air filters, in conjunction with other air monitoring procedures. Collection of high volume air sampler filters is prescribed in SOP-5174, "Air Sampling Using the High Volume Samplers." Collection of AIRNET samples during an emergency event is prescribed in SOP-5173, "AIRNET Sample Analyses for Unplanned Releases."

2.2 Precautions

Collection of air samples during an emergency event is directed by the Laboratory Emergency Operations Center (EOC) and will follow the EOC approval process and the sampling plan developed by the EOC.

3.0 EQUIPMENT AND TOOLS

None.

4.0 STEP-BY-STEP PROCESS DESCRIPTION

WES-EDA personnel	1.	The decision to change-out air filters during an unplanned event will normally be made by WES-EDA personnel, either located in the Emergency Operations Center (EOC) Emergency Technical Support Center (ETSC) or located at the Pueblo Complex.
	2.	WES-EDA personnel will appoint one person to be the contact with the SMO, who then serves as the point of contact with the analytical laboratory for ordering air filter analyses for an emergency event.
Sample Management Office (SMO)	3.	The Sample Management Office (SMO) will be the point of contact with the analytical chemistry laboratory, when requesting air filter analyses during an emergency event. Keith Greene, SMO, will normally be the analytical chemistry laboratory contact, 795-1460 (cell). The SMO is operational from 7 am to 7 pm Monday thru Friday and is on-call at other times (20 minute response time). Joylene Valdez (665-9968) and Karen Schultz-Paige (665-3527) serve as back-up for Keith Greene.

WES-EDA personnel, SMO	4.	When making the decision to send filters for off-site analyses, consider that ARS in White Rock can perform gross alpha/beta and gamma spectroscopy analyses, and HPAL can perform gross gamma analyses.
	5.	Prioritize the analyses required, to assure that the filters are analyzed for the most important radionuclides/metals/organics. For example, if mercury is required, it will require the entire ¼ or ½ filter available, limiting the availability of filters for other required analyses.
	6.	Direct air sampling personnel to perform a radioactivity screening of air filters prior to shipping, following procedure SOP-5173, "AIRNET Sample Analyses for Unplanned Releases.".
	7.	If the decision is made to request analyses of AIRNET filters, do not request destructive analyses for all available filters. Consider that information may be gained from the first set of analyses that may influence the request for subsequent analyses.
	8.	For HiVol filters, direct air sampling personnel to cut the filters into 4 quarters prior to shipping to the analytical laboratory, so that the individual quarters can be assigned to gross alpha/beta, radionuclides, metals/inorganics, as needed.
	9.	For HiVol filters, direct air sampling personnel to retain one quarter sample at LANL for possible future analyses.
	10.	Direct air sampling personnel to send in a blank filter with each sample shipment, to serve as the matrix blank.
	11.	As part of the analytical laboratory request, include gross alpha/beta screening of the air filters.
SMO	12.	With the analytical chemistry laboratory, determine the length of time until analytical results will be available. Two days is the fastest turn around that can be typically gained from the analytical laboratory for isotopic/metals/inorganic analyses. Gross alpha/beta counting can be accomplished within ½ day of sample receipt.
WES-EDA personnel	13.	Consider, as necessary, the cost for air filter analyses. The contract with the analytical chemistry laboratories has required turn around times. For standard cost of analyses, turn around time is 28 days. The Laboratory can provide faster turn around times, with a higher cost. 21 days = 1.2 * normal cost 14 days = 1.5 * normal cost 7 days = 1.75 * normal cost <7 days = 2 * normal cost It is noted that Sr-90 requires a 10 day turn around and cannot be accelerated.
	14.	Understand the minimum detectable quantities that the analytical chemistry laboratory can provide. If the atmospheric concentrations predicted (by dispersion modeling or calculation) are less that the minimum detectable quantities provided in Attachment 1, then, it is possible that no analytes will be identified by the analytical chemistry laboratory.

4.1 Records Management

WES-EDA personnel and SMO	1.	Maintains and submits records and/or documents generated to the Records Processing Facility according to EP-DIR-SOP-4004, Records Transmittal and Retrieval Process.

5.0 DEFINITIONS

N/A

6.0 PROCESS FLOW CHART

N/A

7.0 HISTORY OF REVISIONS

Revision No. *[Enter current revision number, beginning with Rev.0]*	Effective Date *[DCC inserts effective date for revision]*	Description of Changes *[List specific changes made since the previous revision]*	Type of Change *[Technical (T) or Editorial (E)]*
0		New Document	E

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ATTACHMENT 1

SOP-5222-1

Records Use only

MINIMUM DETECTABLE QUANTITIES BY RADIONUCLIDE

Isotopic Spectroscopy Counting Radionuclides and Required Minimum Detectable Concentrations (MDCs)	
Radionuclide	**MDC Air Filter pCi/sample)**
^{60}Co	0.02
^{137}Cs	0.02
^{241}Am	0.20
^{244}Cm	0.06
^{237}Np	0.06
^{210}Po	1
^{238}Pu	0.2
$^{239/240}$Pu	0.2
^{226}Ra	1
^{228}Th	0.1
^{230}Th	0.1
^{232}Th	0.1
^{234}U	0.2
^{235}U	0.2
^{238}U	0.2

Liquid Scintillation Counting Radionuclides and Required Minimum Detectable Concentrations (MDCs)	
Radionuclide	**Air Filter pCi/sample**
^{3}H	5
^{14}C	20
^{99m}Tc	20
^{210}Pb	10

Gas Proportional Counting Radionuclides and Required Minimum Detectable Concentrations (MDCs)	
Radionuclide	**MDC Air Filter pCi/sample**
Gross α	3
Gross β	7
^{90}Sr	2
^{210}Pb	2
^{210}Po	2
^{226}Ra	2
^{228}Ra	1
^{99}Tc	10