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## Environmental Programs Directorate

### Standard Operating Procedure

for **AIRNET—EVALUATION OF SAMPLER SITES  
AGAINST SITING CRITERIA**

**APPROVAL SIGNATURES:**

<b>Subject Matter Expert:</b>	<b>Organization</b>	<b>Signature</b>	<b>Date</b>
Andrew Green	WES-EDA	Signature on File	4/6/2009
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## 1.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) states the responsibilities and describes the evaluation of AIRNET sampler sites against siting criteria for the Los Alamos National Laboratory (LANL) Waste and Environmental Services Division (WES).

All WES participants shall implement this procedure when evaluating the AIRNET sampler sites.

## 2.0 BACKGROUND AND PRECAUTIONS

### 2.1 Background

AIRNET sampler sites should be evaluated on the following schedule:

- New sites: Evaluate all new candidate sites before finalizing the location.
- EPA compliance stations: Re-evaluate bi-annually when leaves are out on trees and bushes.
- Non-compliance stations: Re-evaluate on as-needed basis, as resources allow. Perform evaluations when leaves are out on trees and bushes.

Refer to the following criteria (taken from DOE/EH-0173T and 40 CFR 58) when performing a site evaluation according to the steps in the following section. [NOTE: 40 CFR 58 applies to the establishment of air monitoring stations for “criteria pollutants” (e.g., SO<sub>x</sub>, NO<sub>x</sub>, CO, ozone, and particulates) and does not apply to monitoring radionuclides. 40 CFR 58 is used as guidance.]

#### Criterion 1

Favorable surface characteristics: To reduce particulate loading of filters, sites must have minimal material that is prone to air suspension. Sites whose surfaces are stabilized and protected by ground cover vegetation, or sites that are located on solid rock, concrete, pavement, or gravel with minimal loose surface material, are considered acceptable. The potential for dust from nearby unpaved roads and from excavation areas should be considered in evaluating the acceptability of a site.

#### Criterion 2

Acceptability of the location: According to 40 CFR 58, samplers “must be 10 m from the dripline when the tree(s) act as an obstruction.” If a sampler is greater than 10 m from the nearest tree dripline, then the location is considered acceptable. If the distance is 10 m or less, one of the following two conditions must be met:

- A tree is not considered an obstruction if the distance to the tree dripline is greater than two times the height the tree extends above the sampler (equivalent to a rise angle from the sampler to the top of the potential obstruction of approximately 27° or less).
- A tree is not considered an obstruction if it is located outside a 270° arc measured from the sampler location toward the specific source being monitored (40 CFR 58).

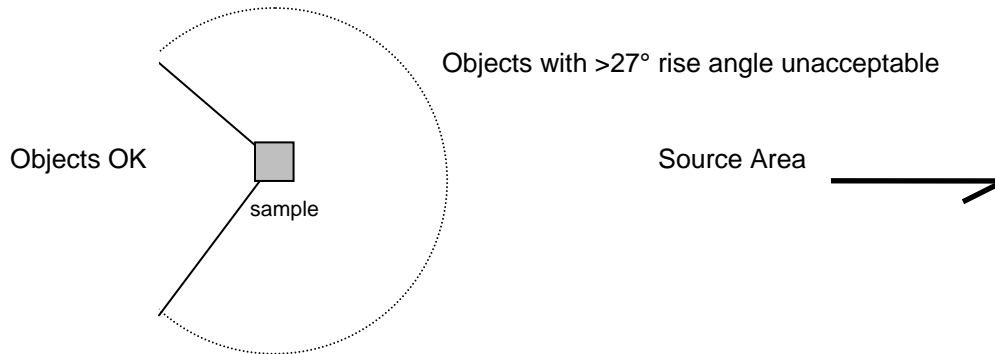
#### Criterion 3

Distance to obstructions (primarily buildings) greater than two times the height the obstruction extends above the sampler: The distance between the sampler and the obstruction must be at least twice the height difference between the sampler and the obstruction (equivalent to a rise angle from the sampler to the top of the potential

obstruction of approximately 27° or less). Concerns about whether an obstruction needs to be considered according to this distance/height criterion may be addressed below according to criterion #4.

**Criterion 4**

Unrestricted airflow in 270° arc around the sampler: An object (excluding trees, which are addressed in criterion 2) is not considered an obstruction if all parts of the object are outside a 270° arc measured from the sampler location toward the source(s) being monitored (40 CFR 58).



**Criterion 5**

Good topographic location: The ideal location is a flat surface. Sites within topographic depressions should be evaluated according to criteria #3 and #4 above to determine if the depression itself obstructs airflow to the sampler. If a site meets these criteria, it is acceptable. No criteria specific to locating samplers near topographic depressions were found. In the LANL area, several samplers are located on the edges of canyons. Although there are presumably airflow effects associated with this type of location, no regulatory criteria apply and the acceptability of these stations is based on scientific judgment.

**2.2 Precautions**

None

**3.0 EQUIPMENT AND TOOLS**

Equipment needed to perform task are described in sections below.

**4.0 STEP-BY-STEP PROCESS DESCRIPTION**

**4.1 Evaluation of a Sampler Site**

- Worker
1. Obtain the following supplies:
    - compass
    - an instrument for measuring vertical angle
    - 30 m (100 ft.) tape measure
    - AIRNET Sampler Site Evaluation form(s) (Attachment 1)

- Worker
2. Determine the direction or location of the source for the site.
- 
3. At the site, describe surface characteristics on form. Determine whether site is acceptable per this criterion and record on form.
- 
4. If there are trees or other vegetation at or above the height of the sampler, determine whether the driplines from any are within 10 m of the sampler. If not, indicate that trees are acceptable on the form and skip to Step 5. If tree driplines are within 10 m, measure the direction and distance to the trees, and record locations on the evaluation form and plot on the site map. Proceed with Step 5.
- 
5. Measure the vertical angle while standing beside the station to the top of trees and other objects. If this angle is less than 27° for each object, then indicate that objects are acceptable on the form. If the angle is greater than 27° for any object, determine if the object is within the 270° arc containing the source and the prevalent wind direction as described in criterion 4 and record the angle on the evaluation form. If any of the objects whose vertical rise angle was greater than 27° fall within this arc, then objects are unacceptable and this should be indicated on the form. Otherwise, indicate that the objects are acceptable.
- 
6. Describe the topography of the site, indicating approximate distances and directions to significant topographic features. If the site is in a depression deeper than the height of the sampler, record the vertical rise angle to the top of the depression. If angle is greater than 27°, then the site identify as unacceptable under the topography criterion.
- 
7. If the site is unacceptable under any criterion, survey the area to see if a better site is nearby and record observations or recommendations.

#### 4.2 Judgment in Applying Criteria

- Worker
1. Uniform application of the criteria is important to ensure consistency and adequacy among air sampler locations. However, it may not be possible to site a sampler to meet all criteria listed. Good scientific judgment will be used to select the optimal location based on site-specific criteria and on specific sampling needs.
  2. The Station in Los Alamos Canyon is intended to monitor up-canyon dispersal of radioactivity from TA-41 and TA-02 toward the Ice Skating Rink. The canyon walls and trees are considered obstructions. The specific need for this station outweighs the site-specific criteria.

#### 4.3 Records Management

- Worker
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, AIRNET Project Leader or to the AIRNET files.

### 5.0 DEFINITIONS

N/A

## 6.0 PROCESS FLOW CHART

N/A

## 7.0 ATTACHMENTS

Attachment 1 AIRNET Sampler Site Evaluation Form (1 page)

## 8.0 REVISION HISTORY

Revision No. <i>[Enter current revision number, beginning with Rev.0]</i>	Effective Date <i>[DCC inserts effective date for revision]</i>	Description of Changes <i>[List specific changes made since the previous revision]</i>
0	10/11/95	New document
1	02/22/00	Added HCP as Attachment 1, added step to determine direction of source for the station.
2	8/30/02	Clarify responsibility for maintaining list of stations.
3	03/01/06	Change revision to convert Attachment 1 HCP to HR.
0	4/7/2009	New document number and reformatted for WES division. Formerly RRES-MAQ-207.

[If you have read and understand the preceding document, click here to receive EDS credit.](#)

**ATTACHMENT 1: AIRNET SAMPLER SITE EVALUATION FORM**

**SOP-5147-1**

**AIRNET SAMPLER SITE EVALUATION FORM**

Records Use only



**Part 1 Site Map**

Station name: \_\_\_\_\_ Station number: \_\_\_\_\_



**Part 2 Comments** If any criterion is unacceptable, indicate whether station requires relocation or provide rationale for leaving in present location. Attach additional sheets if needed.

Example

**Part 3 Final Evaluation**

Surface characteristics acceptable	Y N
Trees acceptable	Y N
Other potential obstructions acceptable	Y N
Topography acceptable	Y N

If any criteria are unacceptable, indicate proposed action in Comments section.

\_\_\_\_\_  
Evaluator signature

\_\_\_\_\_  
Name (print)

\_\_\_\_\_  
Date