

STANDARD OPERATING PROCEDURE

***Instructions for Calibration and Use of an Andersen Series 110 Constant Flow Air Sampler***

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**KEY WORDS**

air sampling, Andersen air sampler

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Environmental Monitoring Branch organization and personnel, such as management, senior scientist, quality assurance officer, project leader, etc., are defined and discussed in SOP ADMN002.

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## **1.0 INTRODUCTION**

### **1.1 Purpose**

Monitoring air quality requires the use of equipment to pump air through sampling media such as activated charcoal or XAD resin (SOP FSAI00.01) for analysis. This document describes the use of the Andersen Series 110 Constant Flow Air Sampler Model 114 as an air pump to collect samples for analysis of air contaminants.

### **1.2 Scope**

This document provides specific instructions for the calibration and use of the Anderson Series 110 Constant Flow Air Sampler Model 114.

## **2.0 MATERIALS**

- 2.1** Anderson Series 110 Constant Flow Air Sampler Model 114
- 2.2** Energy source
- 2.3** Rotameter or DryCal® Flowmeter
- 2.4** Sample tube
- 2.5** Chain of Custody form
- 2.6** Dry ice and ice chest

## **3.0 PROCEDURES**

### **3.1 Calibration and Equipment Check**

- 3.1.1** The Andersen air sampler ranges from 0 to 30 liters per minute (lpm). To test the variations of media, pump rate and duration a trapping efficiency test can be conducted (FSAI003.00). The flow rate of the pump will be determined by the project leader.
- 3.1.2** The flow rate is set with the flow adjust knob located on the left side of the front inside panel (Figure 1). Connect representative field sample container to intake tube. Turn sampler on. Adjust flow to desired rate on the rotameter located on the air sampler. Next,

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check flow with hand held rotameter or flowmeter. Adjust the flow if off by more than 10 percent of target flow rate. See 3.3.1 and 3.3.2 for more detail on adjusting and reading flow with specific types of sampling media.

- 3.1.3 If unable to achieve target rate, replace sampler with another.

### **3.2 Sampler location**

Sampling locations will be specific to the experimental plot and the study objectives. The sampler should be located in an area with no restriction of air flow. The sampler should be positioned to avoid exposure from engine exhausts, running motors or other sources of non-target air contaminants that may interfere with sample collection and chemical analysis. If using a generator for a power source, make sure to place sampler a sufficient distance away to avoid drawing exhaust fumes into sample container. Choose an area where the equipment is secure and access is available when necessary.

- 3.2.1.1 Upon completion of desired sampling time, repeat flow reading and note on chain of custody. Turn sampler off. Remove sample cartridge and screw caps on both ends. Place cartridge back in plastic bag. Note ending time and elapsed time reading on chain of custody. Complete chain of custody and place with sample in plastic bag. Place on dry ice.

### **3.3 Sampling methods**

- 3.3.1 Glass sample tubes (described in SOP number FSAI001.01)

- 3.3.1.1 Remove caps from ends of sample tube. Place sample tube in end of tubing or in sample tube holder (Figure 1). If placed in tube holder, holder should be tightened by hand. To check for leaks around the sample tube, turn on pump and cover sample tube opening with hand. Vacuum gauge level should read at least  $-24$  to  $-25$  in. Hg. If gauge is reading less negative, check tubing and sample tube connection for leaks.

- 3.3.1.2 Zero out elapsed time meter to read 0000. Place rotameter or flowmeter over sample opening and turn sampler on.

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Adjust flow with the flow adjust knob to desired flow rate on the rotameter or flowmeter. Remove rotameter or flowmeter. Note flow rate and clock starting time on chain of custody.

3.3.1.3 Upon completion of desired sampling time, repeat flow reading and note on chain of custody. Remove sample tube and place caps or corks on ends. Note ending time and elapsed time reading. Complete chain of custody and place with sample in plastic bag. Place on dry ice.

#### 3.3.2 Teflon® Cartridges (described in SOP number FSAI001.01)

3.3.2.1 Remove sample cartridge from plastic bag and save plastic bag. Remove caps from sample cartridge. Place media end of sample cartridge into tube attached to the Andersen air sampler. To check for leaks around the sample tube, turn on pump and cover sample tube opening with hand. Vacuum gauge level should read at least -24 to -25 in. Hg. If gauge is reading less negative, check tubing and sample tube connection for leaks.

3.3.2.2 Zero out elapsed time meter to read 0000. Place rotameter or flowmeter over sample cartridge opening and turn sampler on. Adjust the flow adjust knob to desired flow rate on the rotameter or flowmeter. Remove rotameter or flowmeter. Note flow rate and clock starting time on chain of custody.

## **4.0 REPORTING REQUIREMENTS**

### **4.1 Chain of custody**

A chain of custody form should be completed for each sample according to SOP ADMN006.01. The following information should be recorded on the chain of custody:

- 4.1.1 Study number
- 4.1.2 Sample number
- 4.1.3 Sample location
- 4.1.4 Date and time of sampling (also check PST or PDT)
- 4.1.5 Machine identification

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- 4.1.6 Flow rate at beginning and ending of sample period
- 4.1.7 Exact run time for sampling pump
- 4.1.8 Sampling personnel
- 4.1.9 Chemical being sampled

## **5.0 STUDY-SPECIFIC DECISIONS**

The following study-specific decisions are the responsibility of the study project leader, and should be made in consultation with the study field coordinator, senior scientists, and Quality Assurance Officer.

- 5.0.1. Sampling location
- 5.0.2. Flow rate
- 5.0.3. Sampling interval duration
- 5.0.4. Sampling tubes

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**Figure 1. The Andersen Series 110 Constant Flow Air Sampler**

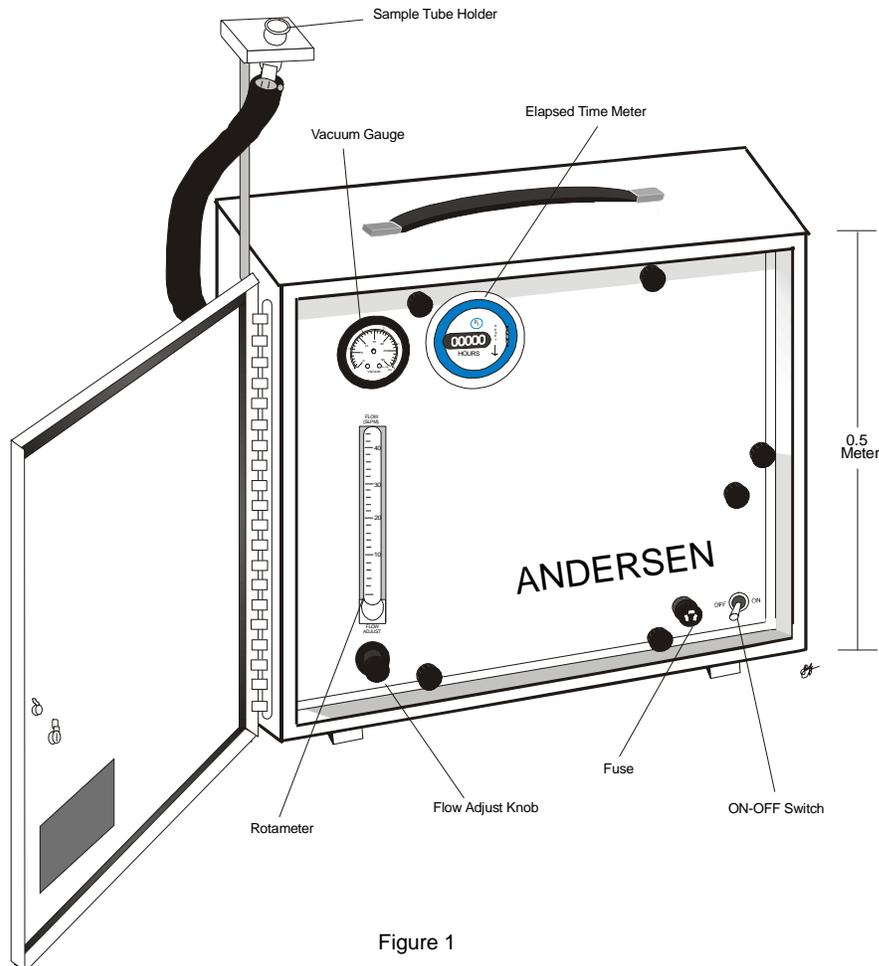


Figure 1