# EXHIBIT TABLE OF CONTENTS


| **Description** (including Part # \| Item # as applicable) | **Page #** |
|---|---|
| Cover Page | 2 |
| 1.0 Purpose | 3 |
| 2.0 Scope | 3 |
| 3.0 Tools/Equipment Required | 3 |
| 4.0 Definitions | 3 |
| 5.0 Responsibility | 4 |
| 6.0 General Information | 5 |
| 7.0 Mercury Vapor Air Sampling Procedure | 5 |
| 8.0 Employee Training | 8 |
| 9.0 Annual Review of Document | 8 |
| 10.0 Exhibits \| Referenced Documents | 8 |
| 11.0 Change Record | 9 |
| 12.0 Approvals | 9 |
| 13.0 Distribution | 9 |

# Daily Air Monitoring

**Document #: HS02007**

Facility Health and Safety Program Documentation
Prepared in Agreement with

NIOSH Pocket Guide to Chemical Hazards &
OSHA Guide for Mercury Vapor

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Revision #: D | Revision Date: 09/01/10

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| Daily Air Monitoring Procedure | Document #: HS-02007 | Revision Date: 09/01/10 | AERC RECYCLING SOLUTIONS |
|---|---|---|---|
| 2591 Mitchell Ave, Allentown, PA 18103<br>APPLIES TO AERC RECYCLING SOLUTIONS LOCATIONS | Department: Regulatory Affairs | Revision #: D | Page: Page 1 of 7 |

## 1.0 Purpose

1.1 The purpose of this plan is to protect all personnel at AERC sites from exposure to mercury vapor.

## 2.0 Scope

2.1 This plan applies to all AERC locations that process fluorescent lamps and mercury containing devices or materials. Specifically, these locations include: 02, 04 and 05.

## 3.0 Tools/Equipment Required

3.1 Jerome Mercury Vapor Analyzer (Typical Equipment: Model X-431)

3.2 Daily Air Sampling Log

3.3 Writing Utensil

3.4 Regeneration Equipment – Jerome Operations Manual; AC Power Cord; Zero Air Filter

## 4.0 Definitions

4.1 **Air Monitoring Points** – Designated locations throughout the facility where Air Sampling is done at a minimum of every two hours at predetermined times.

4.2 **Air Sampling/Monitoring** – The collection and analysis of samples of air to measure the amounts of various pollutants or other substances in the air, or the air's radioactivity.

4.3 **Corrective Action** – The response to air monitoring measurements found to be above defined action levels. Activities are taken to eliminate the cause of a detected nonconformity and to prevent recurrence, e.g., shutdown of operations; removal of a source of the elevated readings; inspection and/or repair of engineering controls.

4.4 **Daily Air Sampling Log** – A daily log where all mercury readings are recorded for each location as performed throughout the facility.

4.5 **Functional Test** – A periodic procedure conducted to verify the Jerome Mercury Vapor Analyzer functionality. The test, which <u>does not calibrate</u> the instrument, generated a measured result that is compared to an expected concentration range for mercury vapor. If the results of this test fall within the expected range – the instrument if functioning properly.

4.6 **Jerome Mercury Vapor Analyzer** – A portable, hand-held, device that detects and measures the level of toxic mercury vapor in the air (commonly called a Jerome Meter).

4.7 **OSHA PEL** – Permissible Exposure Limit as per an 8 hour work shift as designated by the Occupational Health and Safety Administration (OSHA) as found in 29 CFR 1910 Subpart Z, *Toxic and Hazardous Substances*.

4.8 **NIOSH TWA** – Time Weighted Average per an 8 hour work shift that is allowable for employees to be exposed to each day of their working life without irreversible health affects as designated by the National Institute of Occupational Safety and Health.

## 5.0 Responsibility

5.1 The **Director of Regulatory Affairs** is responsible for:

5.1.1 Providing support of efforts by AERC staff in the effective implementation of all safety and health programs within AERC.com, Inc. and its operating facilities.

5.2 The **Health, Safety and Environmental Coordinator** is responsible for:

5.2.1 Managing this program to ensure it satisfies the requirements of all applicable federal, state, and local requirements.

5.2.2 Overseeing the calibrations of the Jerome Meters including follow up with supervisors to ensure completion and maintaining documentation.

5.2.3 Ensuring employees receive training on this procedure.

5.3 **Operations Managers or Supervisors** is responsible for:

5.3.1 Supporting and enforcing this procedure.

5.3.2 Ensuring the Jerome Meter is calibrated per the manufacturer on an annual basis and providing proof of calibration to the HSE Coordinator.

5.3.3 Ensuring employees within their department have received proper training and are familiar with these procedures.

5.4 **All Employees** are responsible for:

5.4.1 Following the proper instructions when completing Air Monitoring Samples in order to achieve accurate results.

## 6.0 General Information

6.1 OSHA PEL for mercury is 0.100 mg/m$^3$ as total mercury (TWA).

6.2 NIOSH TWA for mercury is 0.050 mg/m$^3$ [skin].

6.3 California's Division of Occupational Safety and Health (DOSH or Cal/OSHA) has a Permissible Exposure Limit of 0.025 mg/m3 as total mercury (TWA). In addition Cal/OSHA has a ceiling limit of 0.1 mg/m3. This must never be exceeded for any period of time.

6.4 AERC's Action Level is ½ of NIOSH's and DOSH's Level and ¼ OSHA's PEL for all AERC locations with the exception of the Retort Prep Room (Mitchell Ave Site, PA).

6.5 The AERC Retort Prep Rooms action level shall be the same as OSHA's PEL. However, investigation of elevated readings shall be initiated if levels in the area exceed ½ of the OSHA PEL or .050 mg/m$^3$

6.5 Additional action levels may be needed for certain personnel as indicated by medical needs such as pregnancy or illness. In the case of illness, unless otherwise directed by a physician, the action level is ½ of AERC's determined action level, i.e., 0.0125 mg/m$^3$. Based on physician recommendation for pregnancy, AERC shall not allow pregnant women to enter the primary plant area and shall limit potential exposures to mercury vapor based on the action level of 0.010 mg/m$^3$.

6.6 Air Sampling will be conducted every two hours in established locations throughout the facility called "Air Monitoring Points".

6.7 Supplemental information regarding the operation for the Jerome Meter can be found in the Operation Manual by Arizona Instrument LLC.

## 7.0 Mercury Vapor Air Sampling Procedure

### 7.1 Step 1 – Daily Operations of Jerome Meter

7.1.1 Follow these steps each day prior to use.

7.1.2 Press the power button to ON.

7.1.2.1 The digital meter displays 000.

7.1.2.2 Disregard initial reading.

7.1.2.3 Recharge or replace battery pack if LO BAT indicator REMAINS ON. Refer to manual for battery changing instructions.

7.1.2.4 Allow 1 minute before beginning the next step. This will ensure the instruments electronics have stabilized.

7.1.3 Use the Zero Air Filter to equilibrate the instrument to ambient air temperature.

7.1.3.1 Install the Zero Air Filter in the instrument's intake.

7.1.3.2 Sample continuously until the readings stabilize.

7.1.4 Perform Sensor Regeneration.

7.1.4.1 Refer to page 12 of the Operating Manual.

7.1.5 Zero the instrument 30 minutes after sensor regeneration.

## 7.2 Step 2 – Taking a Direct Reading

7.2.1 After completing all the steps required in the daily operations section of this procedure, press the sample button.

7.2.1.1 During the sample cycle the digital meter displays bars (-, --, ---) to indicate the amount of sensor saturation.

7.2.2 At the end of the sampling cycle, read the digital meter.

7.2.2.1 The number shown on the digital meter is the Mercury Vapor concentration in $mg/m^3$.

7.2.2.2 The value remains on the digital meter until the next sample is taken.

7.2.2.3 The digital meter automatically zeros at the start of each sample.

## 7.3 Step 3 - Annotation of Direct Reading onto Sampling Log

7.3.1 Follow the instructions on the Daily Air Monitoring Log, to annotate the value of air samples taken at all locations listed on the log.

7.3.1.1 The Daily Air Monitoring Log is unique for each location. The forms are as follows: HS-02007-F1 (Pennsylvania), HS-02007-F2 (California), HS-02007-F3 (Virginia), or HS-02007-F4 (Florida).

## 7.4 Step 4 – Responding to High Readings

7.4.1 Corrective Actions need to be taken when air monitoring indicates a value above the aforementioned action levels, specifically:

- $\geq 0.025$ $mg/m^3$ within primary plant and/or warehouse areas;
- $\geq 0.100$ $mg/m^3$ within the Allentown facility Retort Prep Room (PA);

- ≥ 0.010 mg/m$^3$ in the working area of an employee that is either ill or pregnant.

7.4.2 Documentation of corrective actions shall be done as noted below:

7.4.2.1 Place a * in the same block as the reading to indicate a reference to the explanation and remediation protocol. The explanation and remediation protocol should be "spelled out" in the comments section of the Daily Air Monitoring Log.

- Supporting information in the comment section must clearly explain the reasoning behind the elevated reading. It is important to note if there was a change in protocol or if personnel not following protocol caused the high reading. It is also important to note equipment malfunctions or other causes to the high reading.

7.4.2.2 All personnel in the affected area(s) need to be notified and provided with a course of action. If employees need to be removed from the area, they must be given procedures as to their ability to return.

7.4.2.3 The facility manager must be notified of the reading and the determined course of action to remedy the situation.

7.4.2.4 Employees designated to remedy the situation will be briefed on the action plan and provided with the equipment necessary to perform the remediation.

7.4.2.5 Upon remediating the high reading, affected employees with be notified to return to their regular work status.

7.4.2.6 Annotation of remediation should be noted on the Daily Air Monitoring Log.

- A complete explanation of the remediation must be included in the comment section of the log. This includes when personnel were notified, the activities that took place to reduce the readings, proof the readings were brought back to acceptable levels and a time that employees returned to normal duties.

## 7.5 Step 5 – Storage of Completed Sampling Logs

7.5.1 Completed Sampling Logs are managed by the operations or Facility Manager.

7.5.2 The logs shall be stored in the operations area, but shall be accessible to management, the Regulatory Affairs Department and external regulatory agencies.

7.6 **Regular Maintenance and Periodic Meter Functional Testing**

7.6.1 Proper operation of the Jerome Meter requires maintenance and functional evaluation as detailed in the meter's Operation Manual. AERC commonly uses the Jerome® 431-X™ mercury vapor analyzer.

7.6.2 The suggested maintenance schedule is detailed within the Preventive Maintenance Calendar presented in Section 5.0, on page 18 of the current revision of the Operations Manual (Rev: March 2005). Key items of concern are summarized here:

- Change 0.25 inch fritware – Weekly or as needed (Ref: Pg 19)
- Functional testing – Monthly or as needed (Ref: Appendix A, Pg 37)

7.6.3 Functional testing must be done on a regular basis to ensure proper operation of the meter. Form HS-02007-F5, *AER Jerome Meter Function Test Log Sheet*, shall be used to document activities as detailed on pg 37 of the manual. Details on the use of the form are documented in associated work instruction WI-FA09001, *Completion of Jerome Meter Functional Tests - Use of MS Excel Data Form*.

## 8.0 Employee Training

8.1 Employees designated as operators of the mercury vapor analyzer must be trained on this procedure and the use of the sampling log. Demonstration of understanding is required prior to use.

## 9.0 Annual Review of Document

9.1 This procedure will be reviewed on an annual basis to ensure that the information stated complies with both the equipment used on site and with the manufacturer's operation manual.

## 10.0 Exhibits | Referenced Documents

10.1 Operation Manual for the Jerome 431-X Mercury Vapor Analyzer | Rev: March 2005.

10.2 Daily Air Monitoring Logs

- HS-02007-F1, *AERC Allentown Facility Daily Air Monitoring Log*
- HS-02007-F2, *AERC Hayward Facility Daily Air Monitoring Log*
- HS-02007-F3, *AERC Ashland Facility Daily Air Monitoring Log*

- HS-02007-F4, *AERC West Melbourne Facility Daily Air Monitoring Log*

10.3 HS-02007-F5, *AERC Jerome Meter Function Test Log Sheet*

10.4 Facility Jerome Meter Notebook – A copy of this procedure, the site specific log sheet and referenced Operations Manual are available at each location within a the Jerome Meter Vapor Analyzer Log Book. This book

## 11.0 Change Record

| Rev | Date | Responsible Person | Description of Change |
|---|---|---|---|
| A | 4-17-01 | William Bogari | Initial Release of Document |
| B | 3-01-09 | Jane Rodgers \| Health, Safety & Environmental Coordinator | Conversion to New Formatting and Overhaul of Previously Released Components. |
| C | 4-14-09 | Jeff Smith \| Director of Regulatory Affairs | Inclusion of details on Functional Testing requirements and preventive maintenance, including reference to new form HS-02007-F5. |
| D | 9-01-10 | Jeff Smith \| Director of Regulatory Affairs | Update Section 6.0 detailing updated Cal/OSHA PEL. Updated associated daily log form (HS-02007-F2) for Hayward facility. |

## 12.0 Approvals

Approved:

**TITLE:** *Director of Regulatory Affairs* **Jeffery Smith** 9/1/10 **Date**

## 13.0 Distribution

13.1 Electronic Copies to be sent to all universal waste recycling location Facility Managers.

Date: _____ | _____ | _____
MM DD YY

Print Name 1st Shift: _____ Print Name 2nd Shift: _____ Print Name 3rd Shift: _____

| Operators Initials | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| **Air Monitoring Locations** | | 2:00 | 4:00 | 6:00 | 8:00 | 10:00 | 12:00 | 14:00 | 16:00 | 18:00 | 20:00 | 22:00 | 0:00 |
| W0 | Outside Front Office | | | | | | | | | | | | |
| W3 | Office | | | | | | | | | | | | |
| W6 | Break Room | | | | | | | | | | | | |
| W7 | Reception Area | | | | | | | | | | | | |
| W14 | Warehouse (Storage) | | | | | | | | | | | | |
| W15 | Loading Dock | | | | | | | | | | | | |
| W17 | Loading Dock | | | | | | | | | | | | |
| W19 | Storage Room | | | | | | | | | | | | |
| W22 | Storage Room | | | | | | | | | | | | |
| W27 | HID Processing Area | | | | | | | | | | | | |
| W28 | Storage Room | | | | | | | | | | | | |
| W29 | Processing Area | | | | | | | | | | | | |
| W30 | Shared Office | | | | | | | | | | | | |
| W31 | Storage Room | | | | | | | | | | | | |
| W32 | Donning/Doffing Area | | | | | | | | | | | | |
| W34 | West Warehouse | | | | | | | | | | | | |
| W35 | Outside Warehouse | | | | | | | | | | | | |
| W36 | AERC Break room | | | | | | | | | | | | |

| **Comment on any reading over 0.025mg/m3 and explain actions taken to reduce readings.** | N/A = Not Applicable | N/O = Not Operating |
|---|---|---|
| COMMENTS: | | |
| | | |
| | | |

NOTE: PER MANUFACTURERS INSTRUCTIONS - THE SENSITIVITY OF THE AIR MONITORING INSTRUMENT FOR DETECTION OF MERCURY VAPOR IS 0.003MG/M3+20% UP TO 0.025MG/M3. THEREFORE READINGS BELOW 0.003MG/M3 ARE RECORDED AS "<0.003".

FORWARD THIS MONITORING LOG TO THE PRODUCTION MANAGER FOLLOWING EACH SHIFT. THE MANAGER IS REQUIRED TO IMMEDIATELY INVESTIGATE ANY UNUSUAL VALUES, REVIEW/SIGN AND FORWARD THE LOG TO THE OPERATIONS ASSISTANT BY 12:00 FOR THE SHIFT ENDING AT 6:00.

NAME OF SUPERVISOR REVIEWING DOCUMENT: _____ SIGNATURE: _____ DATE OF REVIEW: _____