6 - FUME HOOD 1 – MERCURY ACCESS

Title: Fume Hood 1 – Mercury Access **Doc. No.** 2015-MMTS-6

Approval Signatures and Date

Prepared/Reviewed by:		Date: 3/12/15
Approved by:	Burton Packard	Date: 3/11/15
Approved by:		Date:
Approved by:	GAmunson	Date: 3/11/15

	Initial Release		Annual Review/No Revision Required		Annual Review/Update (see history below)

***NOTE:** This document will be reviewed at least annually to ensure its suitability.*

Revision History

Rev. No.	Change description	Author
1	Change description Crosswalk Between NDEP CAPP Review Comments (dated 2014-12-09, 2015-01-30 and 2015-02-26) and Mercury Storage and Transfer Program Document Contents March 10, 2015	Burton Packard and Renee Rodriguez

***NOTE**: Hard copies of this document may not be the current version. Refer to the "IAmTheKey" to verify the current version.*

Reference Documents

Document number	Document title
Procedure 2015-MMTS-7	Fume Hood 2 – Mercury Transfer
Procedure 2015-MMTS-10	Waste Management
Procedure 2015-MMTS-20	Mercury Medical Surveillance

PURPOSE
This procedure describes the steps and procedures that deal with flask handling, includingflask plug removal and drilling operations (if required) under the fume hood.

6.1 SCOPE

This procedure covers preparing flasks for transferring mercury, i.e., the removal of plugs and drilling flasks if required.

***NOTE**: Flask handling activities that relate to transferring mercury under the fume hood are covered in Procedure 2015-MMTS-7, "Fume Hood 2 – Mercury Transfer."*

6.2 OPERATIONS

***NOTE**: This procedure should be followed in concert with procedures 2015-MMTS-10, "Waste Management") and 2015-MMTS-7, "Fume Hood 2 – Mercury Transfer."*

The six-pack trays containing flasks are moved into Fume Hood 1, where the flask plugs are loosened using the overhead electric impact wrench. A flask with plug that cannot be removed must have a hole drilled into it using the drill press in Fume Hood 1.

***NOTE**: Flask handling operations in Fume Hood 2 that deal specifically with mercury transfers and flask disposal are covered in 2015-MMTS-9, "Fume Hood 2 – Mercury Transfer."*

6.3.1 Required Equipment and Supplies (PPE as specified on page XI of the Executive Summary under General Safety and Health)

The following equipment is needed by those performing work in Fume Hood 1:

- Flask clamp
- Mill cutter (9/16" diam.) and flask holding fixture

***NOTE**: The recommended mill cutter is Kwik Cut C/T Hole Saw, UZ® Engineered Products, Part No. 121937.*

- Drill bit stop (9/16" diam.)

***NOTE**: The drill stop may be needed if a cutting tool other than the Kwik Cut C/T Hole Saw is used; otherwise it is not required.*

- Foil tape – sticky on one side
- Magnetic rod (to collect drill chips)

6.3.2 System Startup and Shutdown

- Startup

- Prior to beginning operations, the Facility Manager (or designee) starts the ventilation system by following the steps given in §25.3.1. Following ventilation system startup, the Facility Manager (or designee) examines the face velocity flow meters on the fume hoods to verify that the face velocity is ≥ 100 ft/min. The face velocity flow meters on each fume hood automatically alarm at less than 100 ft/min.

- Prior to daily operation, the operators will inspect the equipment for damage and check fume hood airflow.

For periods when the fume hood will be left unattended, the operator closes all fume hood doors, including both side doors.

At the conclusion of daily operations

- The operator checks for any equipment operation issues and inspects equipment for mercury contamination/sludge, reporting results to the Facility Manager.
- Operator checks that fume hood doors are completely closed, including both side doors.
- The operator cleans up any waste materials, including gauze, cheesecloth or equivalent and tape, and packages those materials in a slider zip polyethylene bag along with any contaminated cleaning supplies, and moves that(those) bag(s) in an empty tray back through the fume hood door and the conveyor system to the hazardous waste drum in the pallet/drum handling area.

6.3.3 Plug Loosening

- The Flask Handling Area worker moves six-pack trays into the first of two fume hoods, Fume Hood 1 (see Section 8.10, Attachment 1). The trays are positioned so that flask plugs can be removed using the impact wrench (see Section 6.4, Attachment 6.2). The worker engages at least two tray "down-locks" so that the tray cannot move on the roller conveyer table and then installs a flask clamp (see Section 6.4, Attachment 6.3) to prevent flask rotation.
- The operator wraps the neck of the flask with gauze cloth, cheesecloth or equivalent to avoid "flying" plugs and to collect any mercury droplets that may be present.
- The worker engages the overhead impact wrench and loosens the plug. The plug remains in the flask finger tight.

After all flasks in a six-pack tray have had their plugs loosened, the Flask Handling Area worker disengages the flask clamp and flask tray down-locks and moves the tray to the next open location toward Fume Hood 2 (into Fume Hood 2 if possible).

6.3.4 Off Normal Event – Flask Drilling

- Flasks with plugs that cannot be loosened using the impact wrench require a 9/16-inch drilled hole in the shoulder area of the flask to permit mercury to be siphoned from the flask. The problem flask is removed from the six-pack tray using the overhead electric

hoist, and placed in the adjustable flask holding fixture (see Section 6.4, Attachment 6.4) that positions the flask shoulder perpendicular to the drill bit, and rigidly holds the flask. After removing the problem flask, the six-pack tray is moved to the next work position (into Fume Hood 2 if possible).

- The Flask Handling Area worker applies foil tape around the top of the flask to retain chips (see Section 6.4, Attachment 6.5); locks the flask in a position perpendicular to the drill axis, locks the flask holding fixture into position, and proceeds to drill into the flask, just through the shoulder. Before drilling, a 9/16-inch drill stop set to 1 inch should be installed on the mill cutter bit to prevent it from extending down into liquid mercury (see note about the drill stop in Section 6.3.1). After drilling is completed, the flask (still mounted in the drilling fixture) is moved to Fume Hood 2 for mercury transfer.
- After the hole is drilled, the worker carefully removes the foil tape and loose chips. The worker also collects loose drilling chips with a magnetic rod.
- Using gauze pads, cheesecloth or equivalent the worker wipes up the remaining chips; wipes the drill bit and the rod; and places used gauze, metal tape and chips into the hazardous waste accumulation bag for transfer to the hazardous waste drum at the end of the workday.
- Stores the magnetic rod in its storage container within the fume hood.

6.3 ATTACHMENTS

General Arrangement of Work Stations (Attachment 6.1)

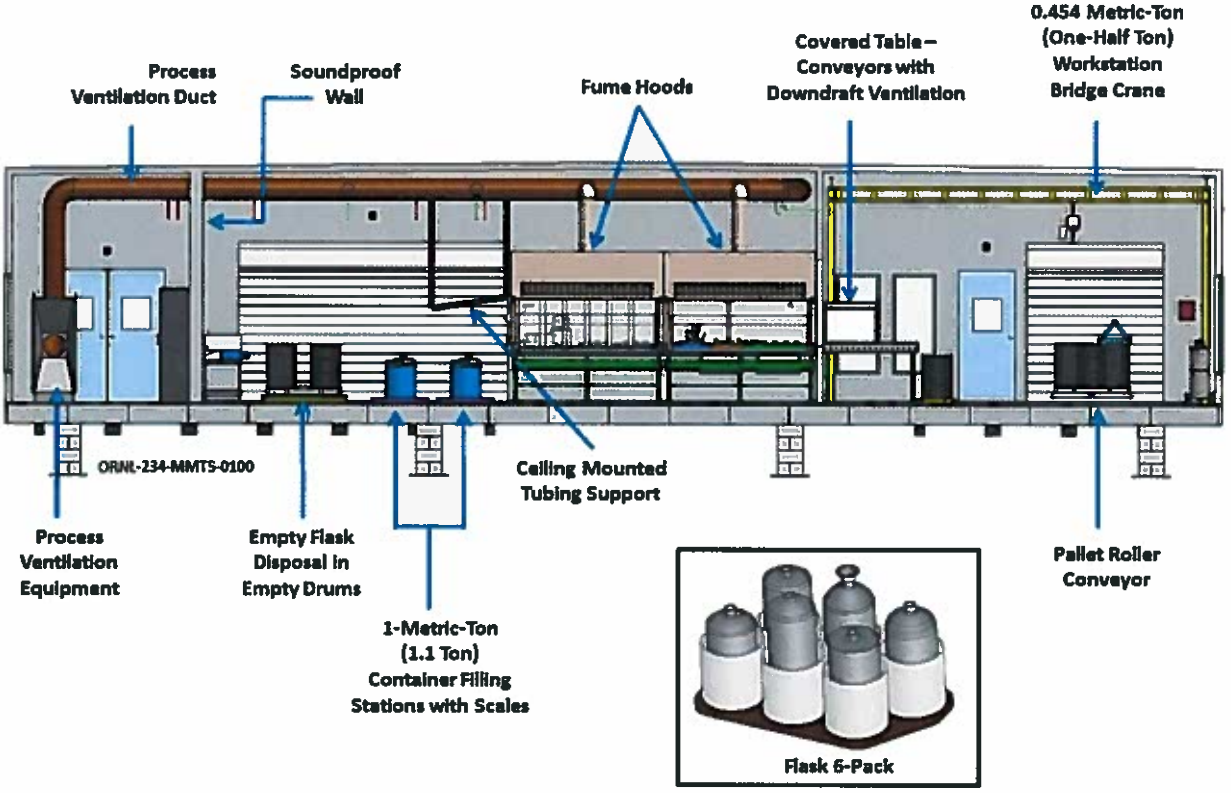
Fume Hood 1 (Attachment 6.2)

Flask Clamp for Trays (Attachment 6.3)

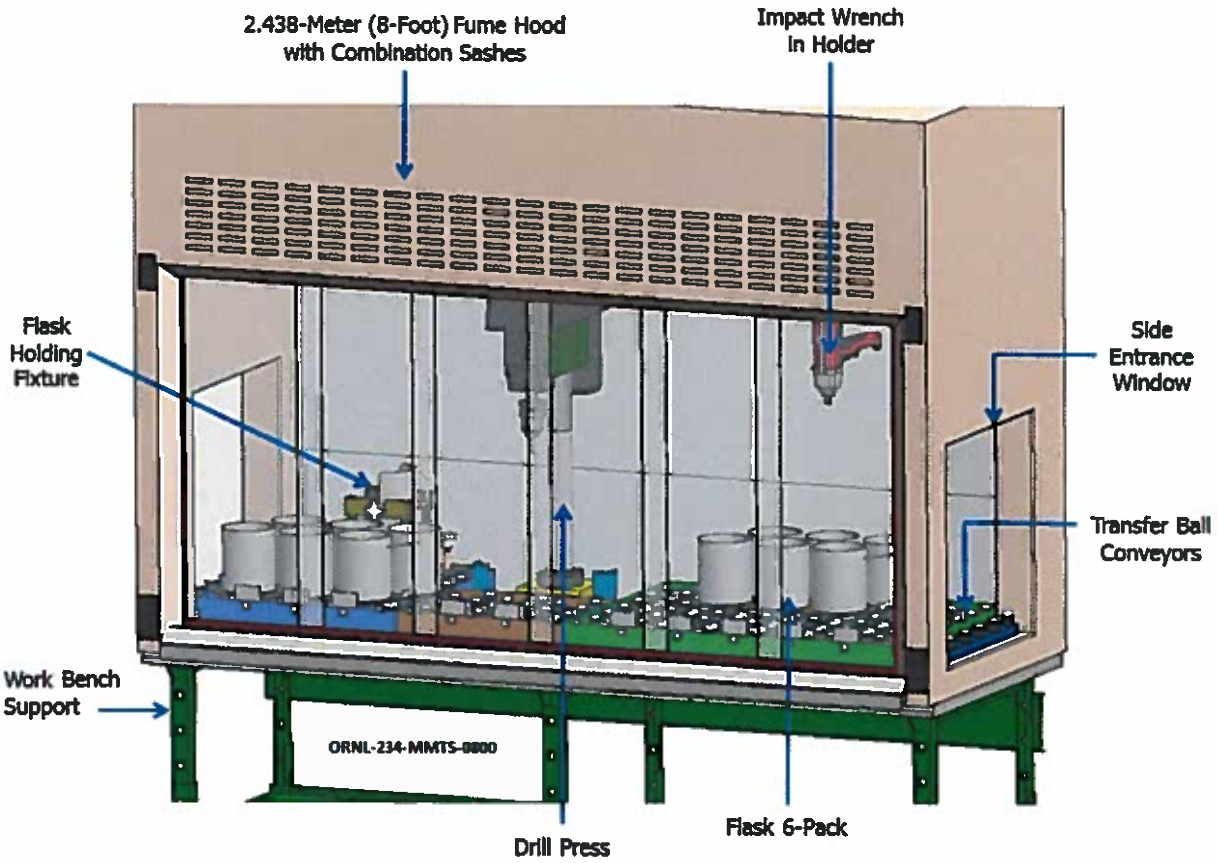
Flask Holding Fixture for Drilling (Attachment 6.4)

Photo of a Flask with Foil Tape (Attachment 6.5)

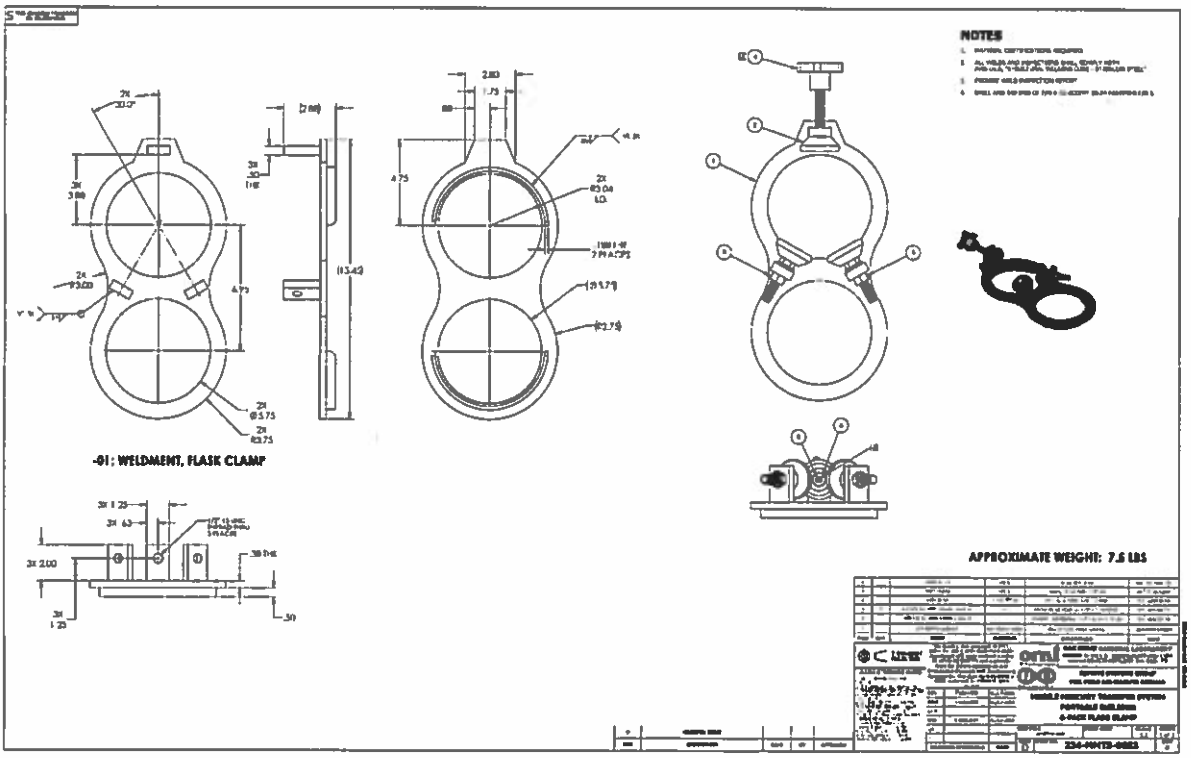
ATTACHMENT 6.1. General Arrangement of Work Stations



ATTACHMENT 6.2. Fume Hood 1

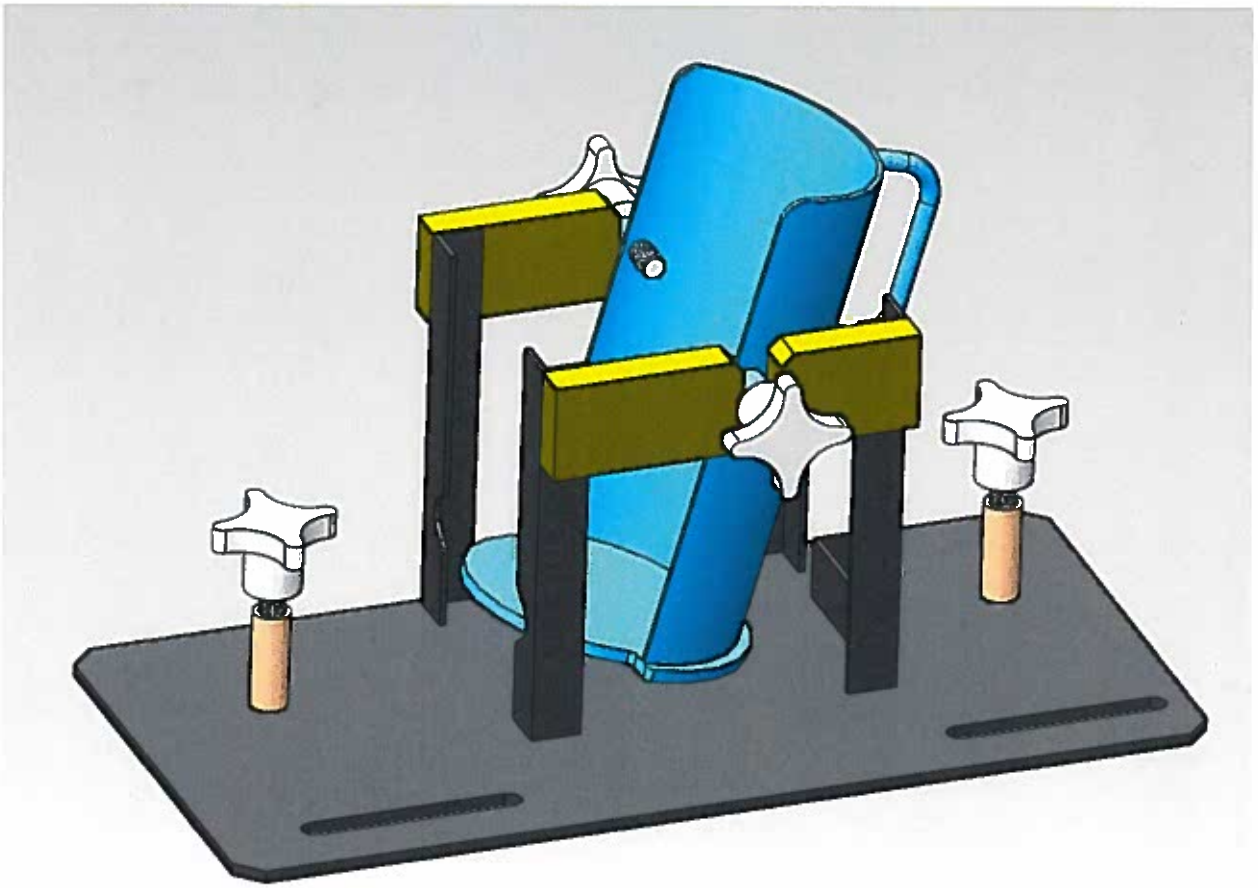


ATTACHMENT 6.3. Flask Clamp for Tray



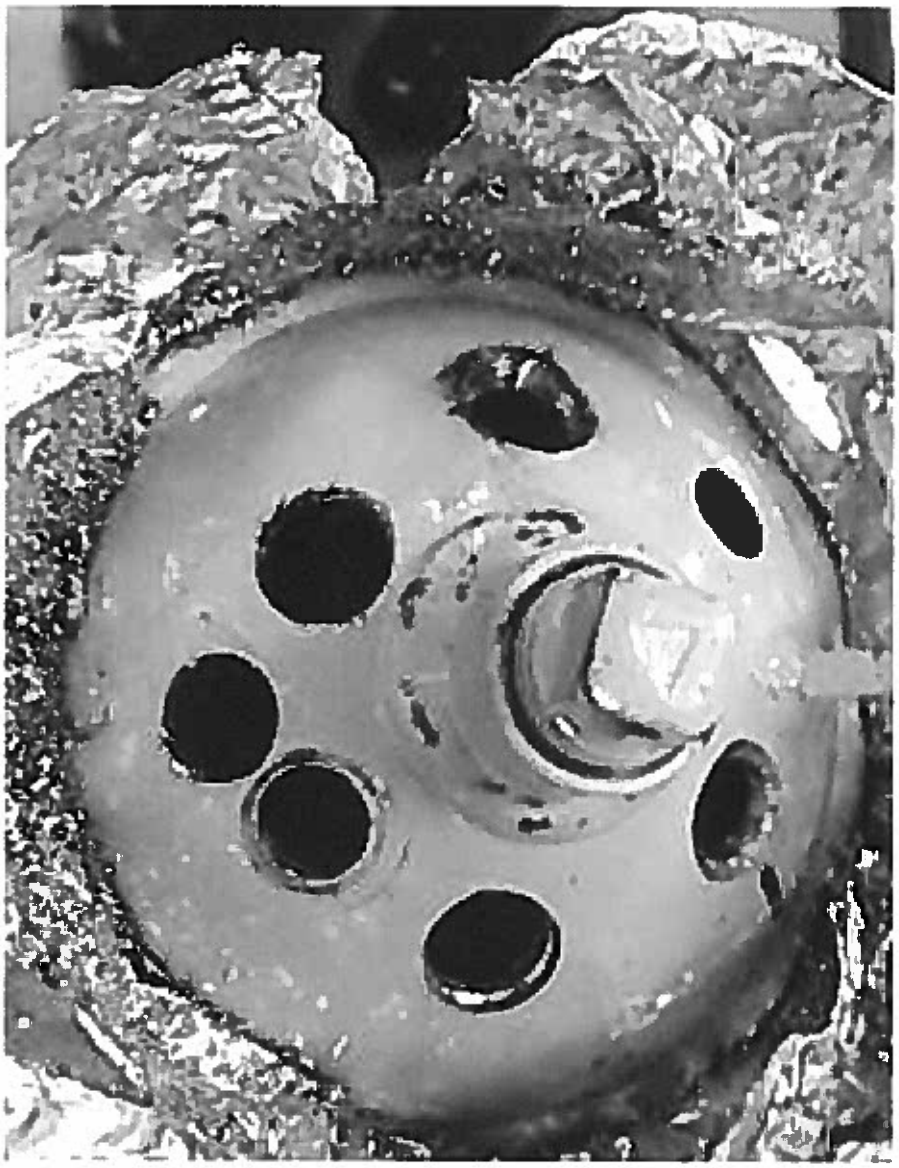
When the impact wrench is used for plug loosening, the clamping collar is employed to firmly hold flasks in their respective trays.

ATTACHMENT 6.4. Flask Holding Fixture for Drilling



While firmly holding the flask, the flask holding fixture adjusts the position of a flask for perpendicular drilling using the drill press.

ATTACHMENT 6.5. Photo of a Flask with Foil Tape



A collar of aluminum foil tape, sticky on one side, placed around a flask before drilling captures most of the drilling chips.