



MERCURY ASSESSMENT

SOP #19000-020

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Area: SCEP

Document Owner: Environment, Health and Safety Manager

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SCOPE AND PURPOSE:

To assess the exposure or likelihood of exposure of a worker to Mercury at the St. Clair Ethanol Plant.

HEALTH HAZARDS:

Mercury may have toxic effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes. The primary route of exposure is inhalation or absorption.

A time-weighted average exposure value of 0.025ppm has been prescribed for mercury in Ontario.

IDENTIFICATION OF MATERIALS:

Sources of mercury at the St. Clair Ethanol Plant include:

1. Mercury Thermometers in the Laboratory
2. Fluorescent Lighting – Tubes

PROCESS DESCRIPTION:

1. Mercury Thermometers

Multiple mercury thermometers are used in the laboratory fume hoods, when analyzing 200 proof ethanol. The volume of the mercury inside of the thermometers is approximately 2 mL. One mercury thermometer is in use at a time.

2. Fluorescent lighting – Tubes

Mercury-containing fluorescent tubes are used in many buildings throughout the entire facility. They are changed by SCEP's in-house electrician. Used tubes are housed in plastic bin and are picked up by a recycling company for removal from the site. The quantity of mercury inside the largest fluorescent lighting tube used on-site is 9 mg.

POTENTIAL FOR EXPOSURE:

1. Mercury Thermometers

Under normal conditions, workers do not come into contact with the mercury that is contained within thermometers. Laboratory Technicians may be exposed to mercury upon breakage of a mercury-containing thermometer. The potential routes of exposure include both inhalation and skin absorption.

2. Fluorescent lighting – Tubes

Under normal conditions, workers do not come into contact with the mercury that is contained within fluorescent light tubes. Electrical personal may be exposed to mercury upon breakage of a new tube, at which time exposure via inhalation is possible.

EXPOSURE CONTROL:

1. Mercury Thermometers

Work & Hygiene Practices -

- Material Safety Data Sheets (MSDS's) are available to all workers.

- No food or drink is allowed in the lab (where potential exposure to mercury exists).
- Mercury-containing thermometers are stored and handled carefully by Laboratory Technicians.

Personal Protective Equipment -

- Laboratory Technicians wear FR coveralls/pants and shirt, gloves and safety glasses while performing analysis related tasks including handling mercury thermometers.

2. Fluorescent lighting – Tubes

Engineering Controls -

- We use fluorescent light tubes that are shatter resistant

Work and Hygiene Practices -

- Material Safety Data Sheets (MSDS's) are available to all workers
- Fluorescent light tubes are stored in the original packaging until needed.
- Both new and used tubes are handled carefully when transporting and replacing them.
- Only personnel who are trained in Energy Isolation are permitted to change lights.
- • Tubes are changed only when other personnel are not present in the immediate area.
- A Mercury Spill Kit is brought to the jobsite when bulb change outs occur.

Personal Protective Equipment -

- Safety glasses and work gloves are worn while replacing fluorescent light tubes.

TRAINING:

All workers, contractors, subcontractors, etc. are informed during site orientation that there is mercury on-site.

St. Clair Ethanol employees receive site-specific designated substance awareness training which includes information regarding on-site sources of mercury exposure, measures and procedures to control exposure and the requirements outlined in the mercury control program.

STORAGE & TRANSPORTATION:

1. Mercury Thermometers

Thermometers are stored in a plastic centrifuge tube located inside the fume hood when not in use. Extra thermometers are kept in their protective case during storage and transportation to the Laboratory, and remain in their protective cases until they need to be put into service. All mercury thermometers onsite are kept track in the laboratory's inventory, as per the laboratory [equipment inventory \(excel\) file.scope procedure SOP-1700-00-7](#).

2. Fluorescent lighting – Tubes

Fluorescent light tubes are stored in the mezzanine area in the maintenance shop, in their original protective packaging. Each tube remains within the protective packaging until needed for installation. Once the replacement is complete, the used tube that is removed is then placed in a protective package for transportation to the recycling location on-site where it is stored until it is picked up by an external contractor for removal from the site.

EMERGENCIES:

If a fluorescent light tube is broken, the area should be vacated and ventilated to allow dissipation of mercury vapour prior to re-entry.

Any releases of liquid mercury and/or mercuric iodide must be cleaned up immediately using the contents of the mercury spill kits, which are maintained in the following locations:

- Laboratory – Red Case above the fridge
- Maintenance Shop – Red Case on shelf by electrical office

A procedure for safe and thorough clean-up is included in each spill kit. This procedure prescribes the use of nitrile gloves and goggles. A half-face piece air-purifying respirator equipped with mercury vapour cartridges must also be worn when cleaning up a spill indoors unless the material is inside a fume hood.

The spill area should be vacated of all people who are not directly involved in the clean-up until the clean-up is complete.

Contaminated materials are to be placed in appropriate waste disposal containers and shipped to a registered waste receiver in accordance with Ontario Regulation 347.

CONCLUSION:

1. Mercury Thermometers

Based on the expected frequency and the small volume of mercury involved, a worker’s health would not likely be affected by a breakage of a mercury thermometer even upon failure of the controls that are in place.

2. Fluorescent lighting – Tubes

Based on the expected frequency and the small volume of mercury involved, a worker’s health would not likely be affected by a breakage of mercury-containing fluorescent tube.

Since worker health is not likely to be affected, a control program is not required. In order to ensure maintenance of existing mercury specific controls a mercury control standard is necessary.

REFERENCES TO RELATED DOCUMENTS:

Ontario Regulation 490/09, “Designated Substances”

END OF PROCEDURE

REVISIONS			
No.	Date (mm/dd/yyyy)	Author	Description
0	01/11/2016	J. Eldridge	Created
<u>1</u>	<u>01/18/2017</u>	<u>J.Eldridge</u>	<u>Updated work practice for fluorescent lighting and lab inventory doc</u>