



## **BENZENE ASSESSMENT**

**SOP #19000-018**

*Issue Date: March 2016*

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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 benzene at the St. Clair Ethanol Plant.

### **HEALTH HAZARDS:**

Benzene may have toxic effects on all major body systems; nervous, digestive, immune etc. The primary route of exposure is through inhalation.

A time-weighted average exposure value of 0.5ppm has been prescribed for benzene in Ontario.

### **IDENTIFICATION OF MATERIALS:**

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

1. Tank Farm- Gasoline Storage Tanks and Marketing Tanks
2. North Grains Receiving Area Gasoline Storage Tank

### **PROCESS DESCRIPTION:**

1. Tank Farm- Gasoline Storage Tanks and Marketing Tanks

Benzene is a component of the gasoline stored on site in the following Denaturant tanks TF-8414 & TF-8424. The gasoline is received in tanker trucks and transferred to dedicated storage (TF-8414 & TF-8424). It is then blended into Ethanol via piping to a concentration of 1.2% target (range from 1 to 4 % ) and stored in the site marketing tanks TF – 8422, TF – 8433 & TF - 8444. Delivery of product to denaturant tanks occurs twice a week, approx. 58 m3 per delivery gets transferred into storage tanks.

2. North Grains Receiving Area Gasoline Storage Tank

Benzene is a component of the gasoline stored on site for gasoline driven equipment. In a year up to three deliveries of unleaded gasoline are made and would total an annual amount of 450L, or 150 L per delivery.

3. Lab Sampling, Analysis and Return to Process

Benzene is a component of the denatured ethanol sampled daily at the facility as denatured ethanol contains 1 to 4% gasoline. Sampling of denatured Ethanol occurs daily and approximately 2 liter samples are transported from the marketing tanks to the lab for analysis, storage and return to process. Storage occurs in a 5 gallon grounded flame resistant container with a spring loaded auto close lid. The waste denatured ethanol is returned to process via a funnel located at the Ethanol Loadout approximately twice per month.

### **POTENTIAL FOR EXPOSURE:**

1. Tank Farm- Gasoline Storage Tanks and Marketing Tanks

Under normal conditions, workers do not come into contact with the benzene that is contained within the denaturant tanks. Shift supervisors and lead hands may be exposed to low amounts of benzene upon the loading

and unloading of the gasoline truck via pumps during hose connects and disconnect, as well as during sampling activities associated with the denatured Ethanol tanks (which contain 1-4% gasoline content). The potential routes of exposure may include inhalation and absorption.

2. North Grains Receiving Area Gasoline Storage Tank – Under normal conditions, workers do not come into contact with the benzene that is contained within the storage tank. Workers may be exposed to low amounts of benzene while transferring gasoline from storage tank to equipment requiring gasoline for operation. The potential routes of exposure may include inhalation and absorption.
3. Lab Sampling, Analysis and Waste – Workers may be exposed to very low concentrations of benzene while conducting sampling and analysis of the site marketing tanks, as well as while returning denatured ethanol to process via the funnel located in Ethanol loadout. The potential routes of exposure include inhalation and adsorption.

## EXPOSURE CONTROL:

1. Tank Farm- Gasoline Storage Tanks

### *Work & Hygiene Practices -*

- Material Safety Data Sheets (MSDSs) are available to all workers.
- No food or drink is allowed in area
- Personnel are present must wash hands thoroughly prior to eating, drinking, smoking
- Contaminated clothing must be removed and washed
- Workers will position themselves upwind of the discharge point

### *Personal Protective Equipment -*

- Employees wear FR coveralls/pants and shirt, gloves and safety glasses while supervising the loading and unloading of gasoline.

2. North Grains Receiving Area Gasoline Storage Tank

### *Work & Hygiene Practices -*

- Material Safety Data Sheets (MSDSs) are available to all workers.
- No food or drink is allowed in area
- Personnel are present must wash hands thoroughly prior to eating, drinking, smoking
- Contaminated clothing must be removed and washed
- Workers will position themselves upwind of the discharge point

### *Personal Protective Equipment -*

- Employees wear FR coveralls/pants and shirt, gloves and safety glasses while re-fueling vehicles.

3. Lab Sampling Analysis and Return to Process

### *Work & Hygiene Practices -*

- Material Safety Data Sheets (MSDSs) are available to all workers.
- No food or drink is allowed in area
- Personnel are present must wash hands thoroughly prior to eating, drinking, smoking
- Contaminated clothing must be removed and washed
- Workers will position themselves upwind of the discharge point when sampling and returning denatured ethanol to/from the process
- Workers will utilize the fumehood whenever practicable when conducting denatured ethanol sampling

### *Personal Protective Equipment -*

- Employees wear FR coveralls/pants and shirt, gloves and safety glasses while sampling and returning denatured ethanol to the process



**TRAINING:**

All workers, contractors, subcontractors, etc. are informed, during site orientation/onboarding of the designated substances on site. Sources of exposure, measures and procedures to control are also reviewed.

**STORAGE & TRANSPORTATION:**

Vendors come to site and directly transfer the product into storage tanks, while site personnel oversee the process. 2 liters samples of denatured ethanol (approximately 1 to 4% gasoline) are transported daily via sample jars, and approximately twice per month the 5 gallon flame resistant container is transported to Ethanol load out to return the waste denatured ethanol to process .

**EMERGENCIES:**

If gasoline is spilled, area should be contained, absorbent material placed on spill and EH&S department to be contacted. EH&S will steward proper disposal through the outbound materials procedure.

**CONCLUSION:**

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

Since worker health is not likely to be affected, a control program is not required.

**REFERENCES TO RELATED DOCUMENTS:**

*Ontario Regulation 490/09, “Designated Substances”*

**END OF PROCEDURE**

<b>REVISIONS</b>			
<b>No.</b>	<b>Date (mm/dd/yyyy)</b>	<b>Author</b>	<b>Description</b>
0	03/28/2016	J. Eldridge	Created