



# VOC's in Missoula's Air

## What are they?

# Toluene

- Sources:
  - Occurs naturally in crude oil
  - Produced in process of making crude oil and coke from coal
  - Used in making paints, paint thinners, lacquers, fingernail polish remover, adhesives, and rubber
- Dangers:
  - Affects the nervous system

# Tetrachloromethane

- Sources:
  - Found in fire extinguishers, solvents for fats & greases, household dry – cleaning fluids
  - Production of freon for refrigerants
- Dangers:
  - Poisonous
  - Known carcinogen

# Ethylbenzene

- Sources:
  - Found naturally in coal and tar
  - Also found in manufactured inks, insecticides, paints, and petroleum
- Dangers:
  - When exposed to high levels – dizziness, throat & eye irritation, tightening of the chest

# Benzene

- Sources:
  - Production of drugs, plastics, gasoline, synthetic rubber and dyes
- Dangers:
  - Known carcinogen
  - Causes drowsiness, dizziness, rapid heart rate, tremors, confusion, unconsciousness and death

# 1,2,4 - Trimethylbenzene

- Sources:
  - Paints and paint thinners
  - Scatter rugs, bathmats
  - Sheet vinyl flooring
  - Wood office furniture
- Dangers:
  - Cardiovascular toxicants
  - Respiratory toxicants
  - Neurotoxicants

# Isopropyl Benzene

- AKA: Cumene
- Sources:
  - Used in petroleum products
  - Paint thinners, lacquers, enamels, high octane fuels
  - Production of phenol, acetone, and acetophenone
- Dangers:
  - Headaches, dizziness, drowsiness, incoordination, and unconsciousness
  - Skin and eye irritant
  - No information is available on chronic health affects to humans

# 1,4-Dimethylbenzene

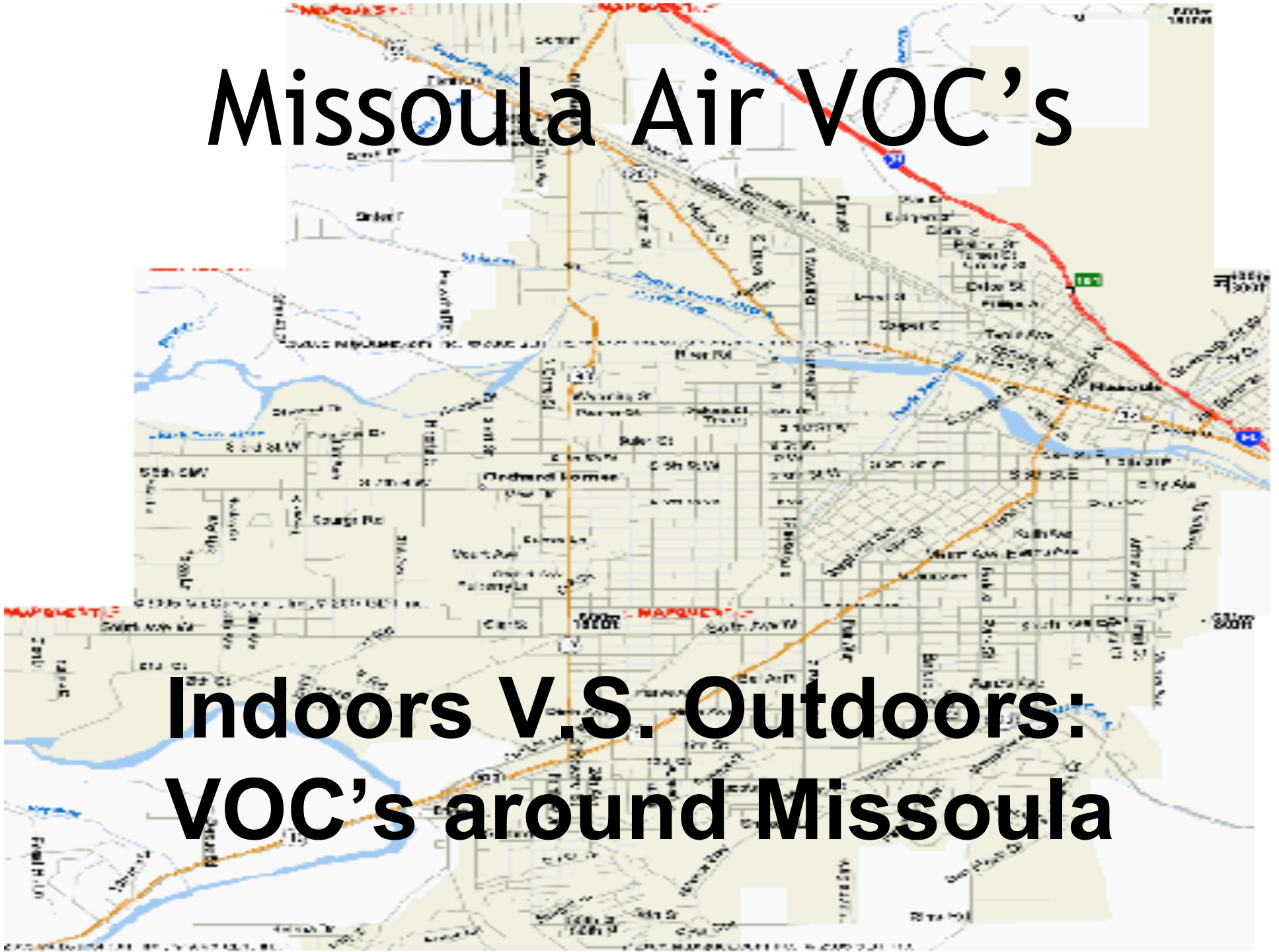
- AKA: p-xylene
- Sources:
  - Primarily from fugitive emissions and exhaust connected with its use in gasoline
  - Industrial sources include emissions from petroleum refining and its use as a solvent and chemical intermediate.
- Dangers:
  - Irritation to eyes, nose, and throat
  - May cause severe breathing difficulty

# 1,2 - Dimethylbenzene

- AKA: o-xylene
- Sources:
  - Primarily from fugitive emissions and exhaust connected with its use in gasoline
  - Industrial sources include emissions from petroleum refining, coal tar and coal gas distillation and from its use as a solvent.
- Dangers:
  - Irritation to eyes, nose, and throat
  - May cause severe breathing difficulty

# Missoula Air VOC's

**Indoors V.S. Outdoors:  
VOC's around Missoula**



# **Project Goals:**

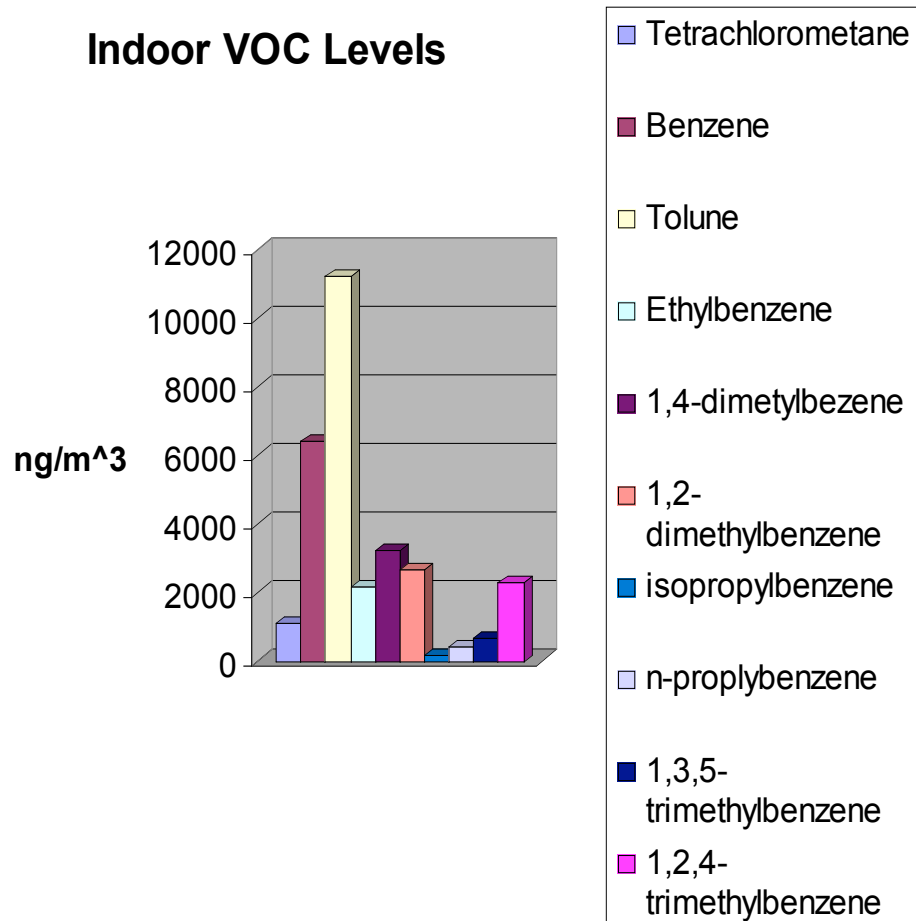
**We worked to compare the amounts of volatile organic compounds in the air between indoor and outdoor environments.**

# **Hypothesis:**

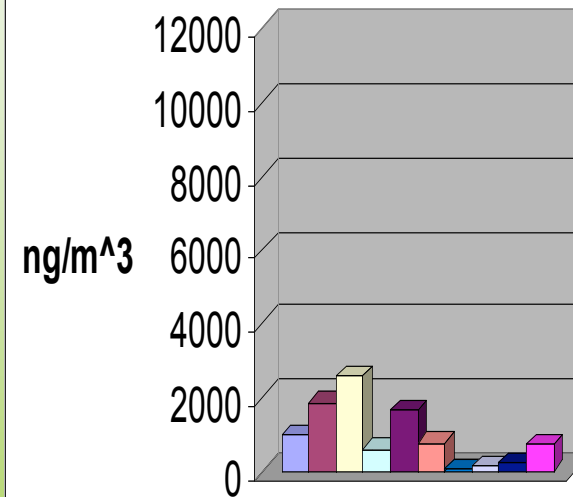
**We believe that the amount of VOC's in the air determines much on weather when outside, while how enclosed an area is and how much fresh air is being circulated through that area affects the indoor areas.**

# What we found:

## Indoor VOC Levels



## Outdoor VOC Levels



# Analyzing the Data

**On average air levels indoors can be as much as four times as hazardous as outdoor air**

# **How to avoid these air hazards within the home**

- 1. Have good air circulation**
- 2. Air purifiers**
- 3. Keep toxic chemicals outside**