

## **HEPTANE (C<sub>7</sub>H<sub>16</sub>)**

Chemical Abstracts Service (CAS) Number: 142-82-5

### **General Information**

Heptane is a colorless liquid with a mild, gasoline-like odor. Inhaling heptane can irritate the eyes, nose and throat. Acute (short-term) exposure to heptane can cause headache, lightheadedness, dizziness, lack of coordination and loss of consciousness. Loss of appetite and/or nausea may occur. Chronic (long-term) exposure to heptane may affect the nervous system. Heptane is not classifiable as to its potential to cause cancer.

### **Sources**

- Heptane is used as an industrial solvent and in petroleum refining processes.
- Heptane is also a component of gasoline and other petroleum-based fuels.

### **Indiana Emissions**

Heptane emissions totals are not available from the National Emission Inventory (NEI) for the 2014 calendar year.

### **Measured Concentration Trends**

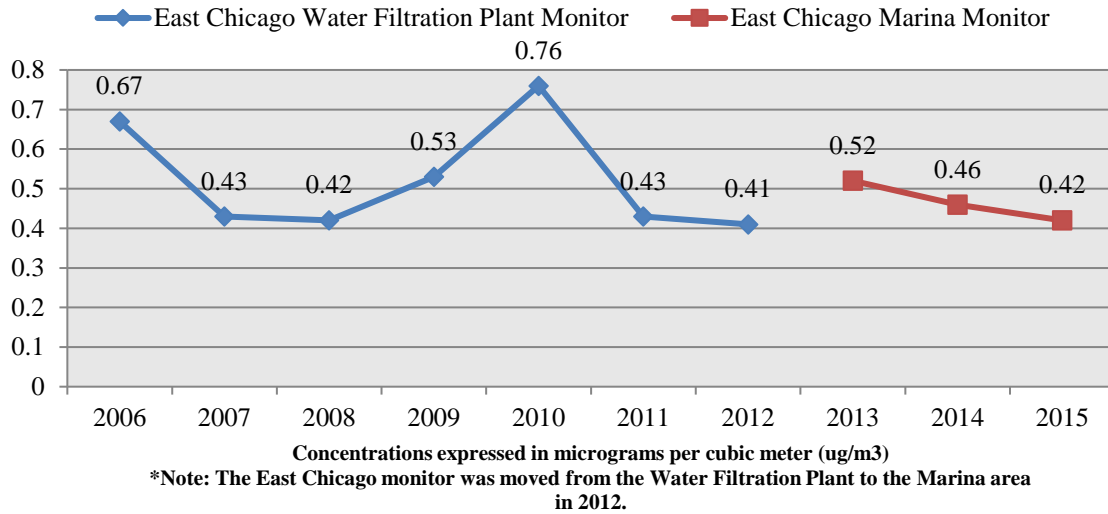
Ambient air monitoring data most accurately represents a limited area near the monitor location. All monitors for air toxics sample every sixth day. The monitoring locations by themselves are not sufficient to accurately characterize air toxic concentrations throughout the entire state, however, results from the monitors will provide exposure concentrations with a great deal of confidence at the monitoring locations.

The ambient air monitoring results were analyzed using U.S. EPA recommended statistical methods. IDEM evaluated the data so that a 95% upper confidence limit of the mean (UCL) could be determined. A 95% UCL represents a value which one can be 95% confident that the true mean of the population is below that value.

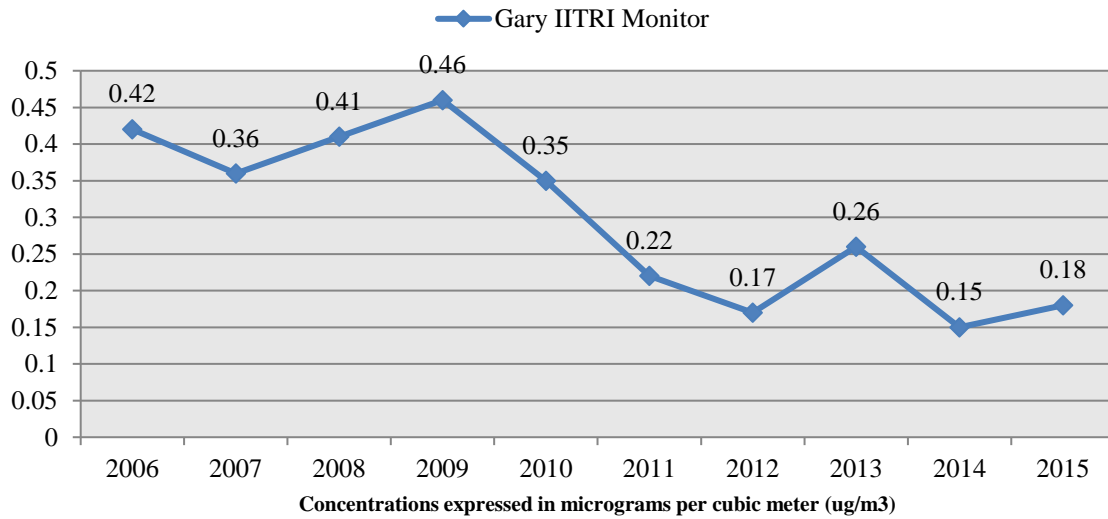
To learn more about the current monitoring locations, please visit IDEM's Air Toxics Monitor Siting webpage at: <http://www.in.gov/idem/toxic/2337.htm>

Data analysis was performed for each monitor that operated for a significant portion of the analysis period. This analysis determined the detection rate, which is defined as the percentage of valid samples taken statewide that had a quantifiable concentration of the pollutant. The statewide detection rate of heptane for the monitors analyzed from 2006-2015 was 86.0%. Trend graphs for each of these monitors are provided below.

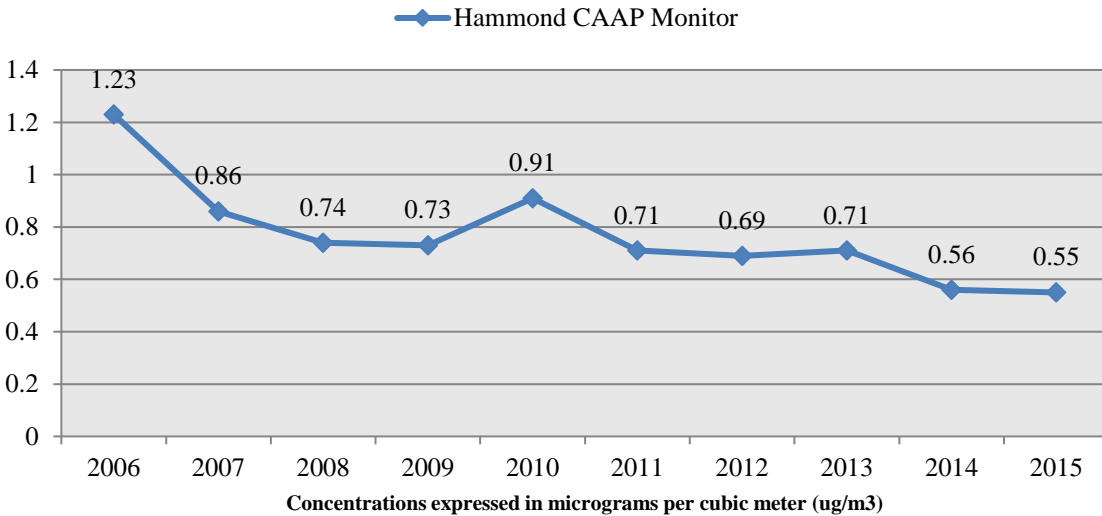
## 95% UCL Heptane Concentrations at East Chicago (2006-2015)



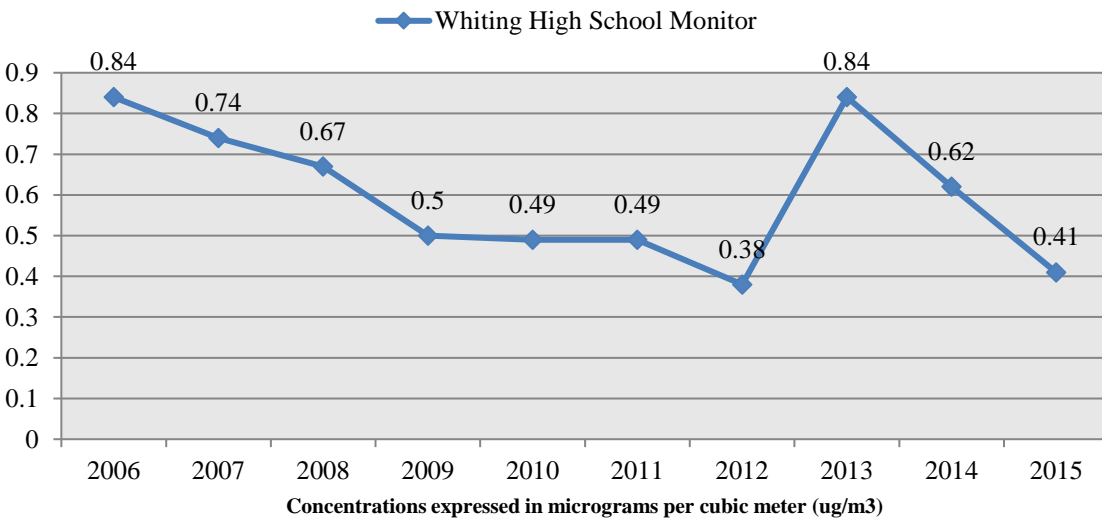
## 95% UCL Heptane Concentrations at Gary (2006-2015)



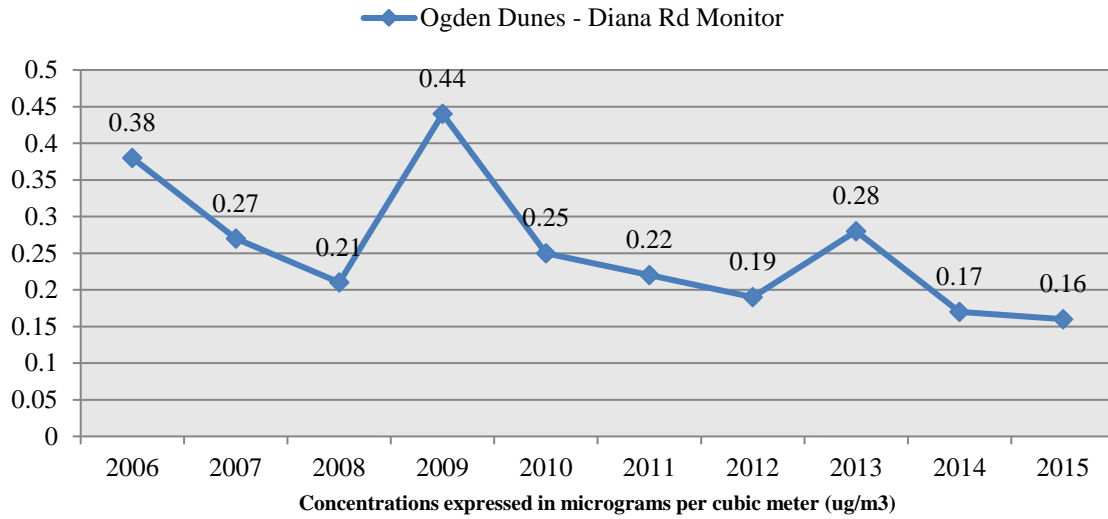
## 95% UCL Heptane Concentrations at Hammond (2006-2015)



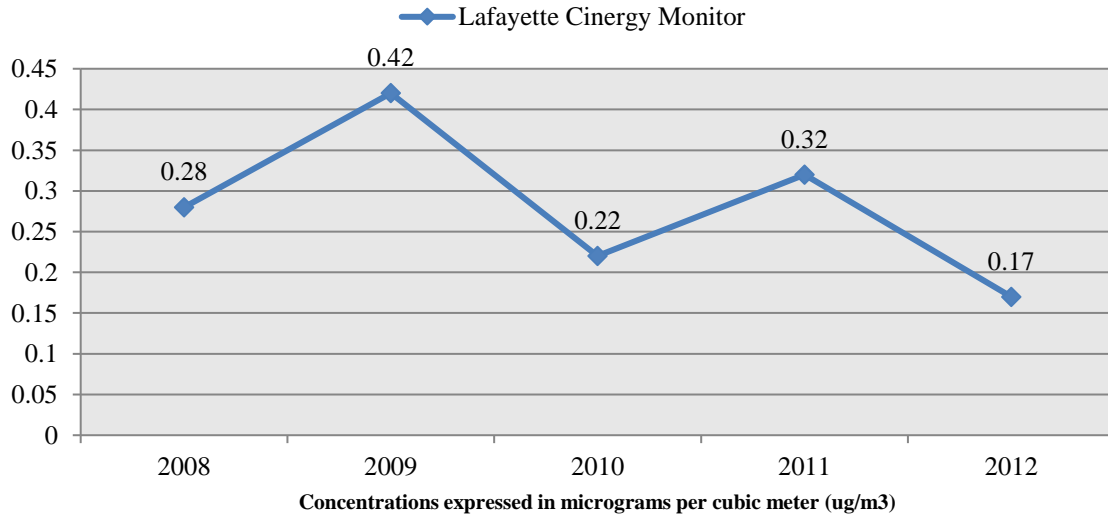
## 95% UCL Heptane Concentrations at Whiting (2006-2015)



## 95% UCL Heptane Concentrations at Ogden Dunes (2006-2015)

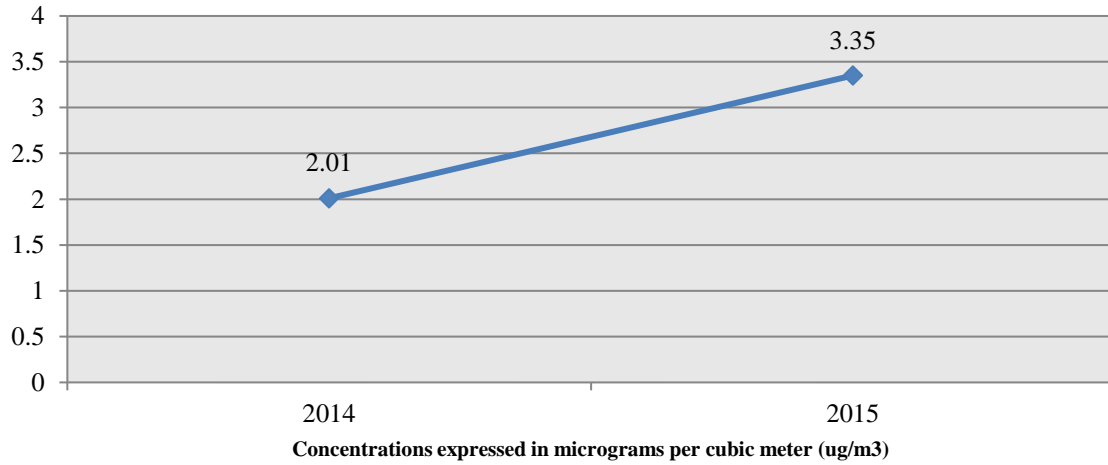


## 95% UCL Heptane Concentrations at Lafayette (2008-2012)



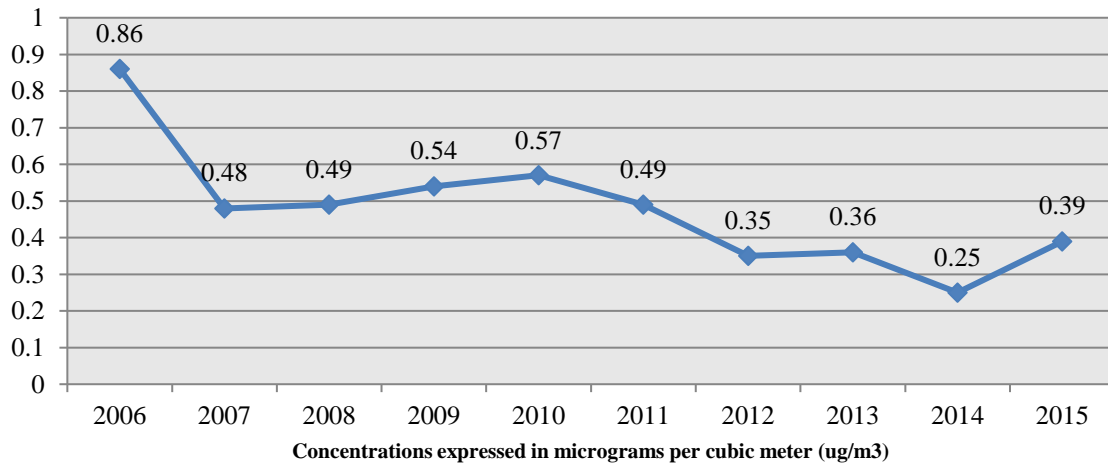
## 95% UCL Heptane Concentrations at Terre Haute (2014-2015)

◆ Terre Haute - Fort Harrison Rd Monitor

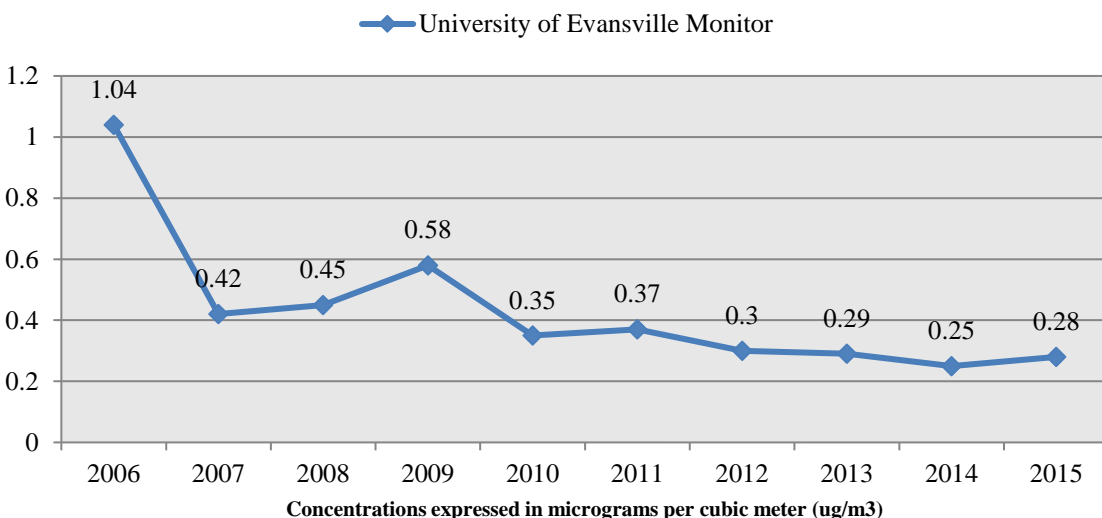


## 95% UCL Heptane Concentrations at Indianapolis (2006-2015)

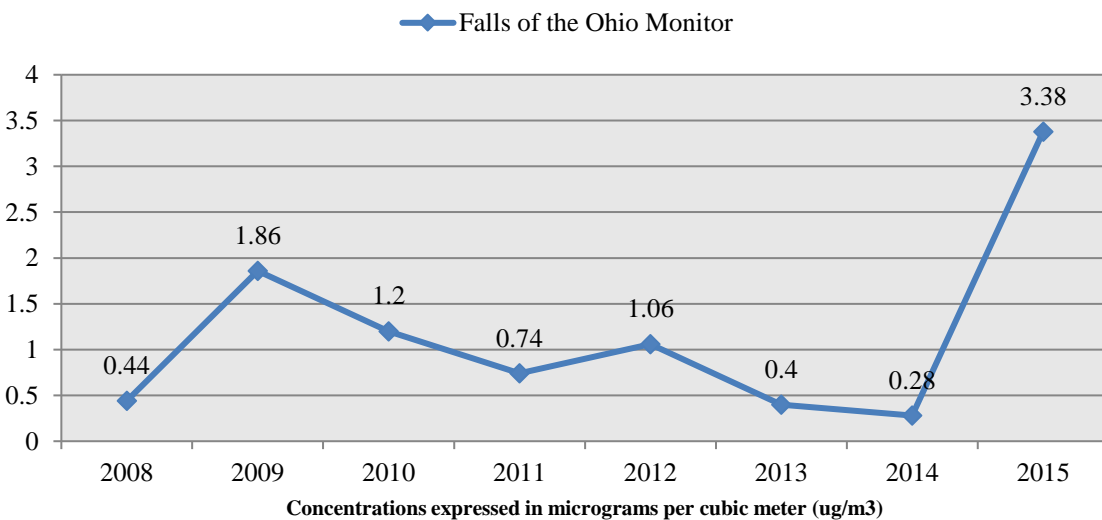
◆ Indianapolis - Washington Park Monitor



## 95% UCL Heptane Concentrations at Evansville (2006-2015)



## 95% UCL Heptane Concentrations at Clarksville (2008-2015)



The analysis of monitoring data from 2006 to 2015 indicates that concentration patterns of heptane have declined or held steady at most monitors around the state. Terre Haute appears to have some of the highest concentrations, but the sample size at this monitor is limited. The most notable exception to the pattern observation is at Clarksville, where measured concentrations spiked during 2015. The 95% UCL value for this year was heavily influenced by a string of unusually high readings during February and March. All other readings for the year were below

the levels observed in February and March. The largest single reading was 25.50 ug/m<sup>3</sup> at Terre Haute on 9/15/2015. This reading is still well below the reference concentrations for heptane. More information about the reference concentration can be found in the hazard quotient section below.

### Hazard Quotient

IDEM evaluates chronic (lifetime) non-cancer hazard assuming a threshold for each pollutant at which a health effect can be observed. That is, it assumes safe exposure to the pollutant up to a certain level before it is possible to experience a health effect from breathing the pollutant. IDEM uses health protective assumptions by taking into account people who might be more sensitive to the pollutants. The hazard quotient is a ratio that divides the measured concentration of a pollutant by the reference concentration (RfC). A hazard quotient under 1.0 is commonly recognized to be below the health-protective level. Hazard quotients over 1.0 indicate that further investigation may be necessary and does not necessarily mean that health effects are expected. Given the many health-protective assumptions used in the evaluation, most non-cancer hazards over 1.0 are still unlikely to be associated with observable adverse health effects.

The average concentration of heptane was evaluated for each air pollutant monitor over the span of this study. The results for each monitor are displayed in the table below. The calculated hazard quotient is below 1.0 at all monitors, which indicates that the measured concentrations of heptane do not present a risk for non-cancer health effects.

**Table 1. Heptane Hazard Quotients** (concentrations expressed in micrograms per cubic meter)

Monitor	Years	Average Concentration	Reference Concentration (RfC)*	Hazard Quotient
East Chicago Water Filtration Plant	2006-2012	0.48	1900.00	0.0003
East Chicago Marina	2013-2015	0.44	1900.00	0.0002
Gary IITRI	2006-2015	0.28	1900.00	0.0001
Hammond CAAP	2006-2015	0.68	1900.00	0.0004
Whiting High School	2006-2015	0.54	1900.00	0.0003
Ogden Dunes – Diana Rd	2006-2015	0.24	1900.00	0.0001
Lafayette Cinergy	2008-2012	0.26	1900.00	0.0001
Terre Haute – Fort Harrison Rd	2014-2015	2.51	1900.00	0.0013
Indianapolis – Washington Park	2006-2015	0.42	1900.00	0.0002

University of Evansville	2006-2015	0.37	1900.00	0.0002
Clarksville – Falls of the Ohio	2008-2015	0.98	1900.00	0.0005

\* Reference Concentration Source: American Council of Governmental Industrial Hygienists (ACGIH)

### **Cancer Risk**

Heptane is not classifiable as to its potential to cause cancer.