

ACETONE (C₃H₆O)

Chemical Abstracts Service (CAS) Number: 67-64-1

General Information

Acetone is a colorless liquid with a distinct smell and taste. It is a manufactured chemical that is also found naturally in the environment. Industrial processes contribute more acetone to the environment than natural processes. Exposure to acetone via inhalation in humans results in irritation of the nose, throat, trachea, and lungs. Exposure of animals to much higher concentrations of acetone than those reported in humans has resulted in respiratory effects including pulmonary congestion, edema, and hemorrhage of the lungs. There is no evidence of increased cancer risk from exposure to acetone.

Sources

- Acetone is used to make plastic, fibers, drugs, and other chemicals. It is also used to dissolve other substances.
- Acetone is present in vehicle exhaust, tobacco smoke, and landfill sites.
- Acetone occurs naturally in plants, trees, volcanic gases, forest fires, and as a product of the breakdown of body fat.

Indiana Emissions

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

Measured Concentration Trends

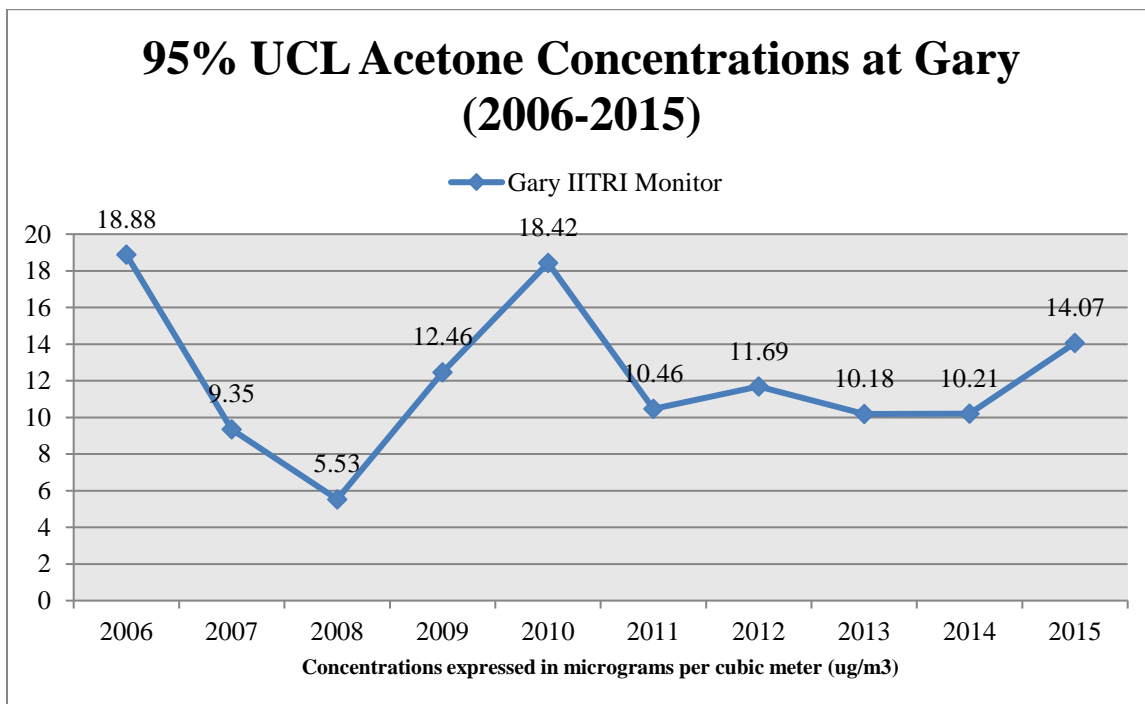
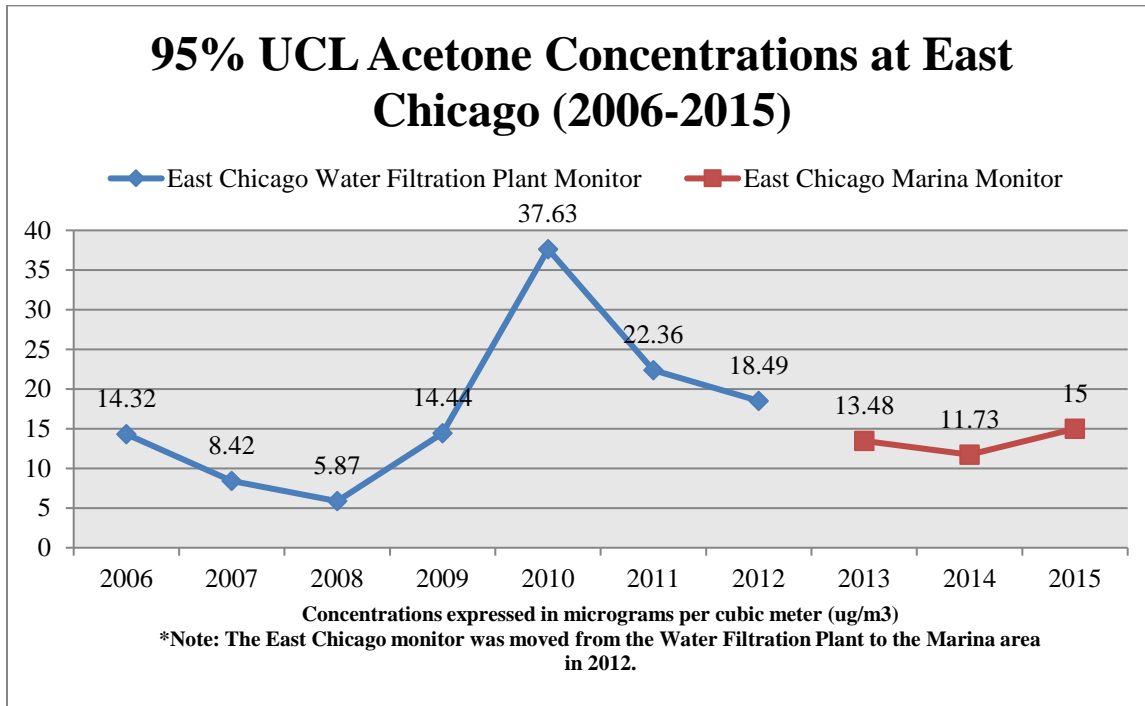
Ambient air monitoring data most accurately represents a limited area near the monitor location. All monitors for air toxics sample every sixth day. The monitoring locations by themselves are not sufficient to accurately characterize air toxic concentrations throughout the entire state, however, results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

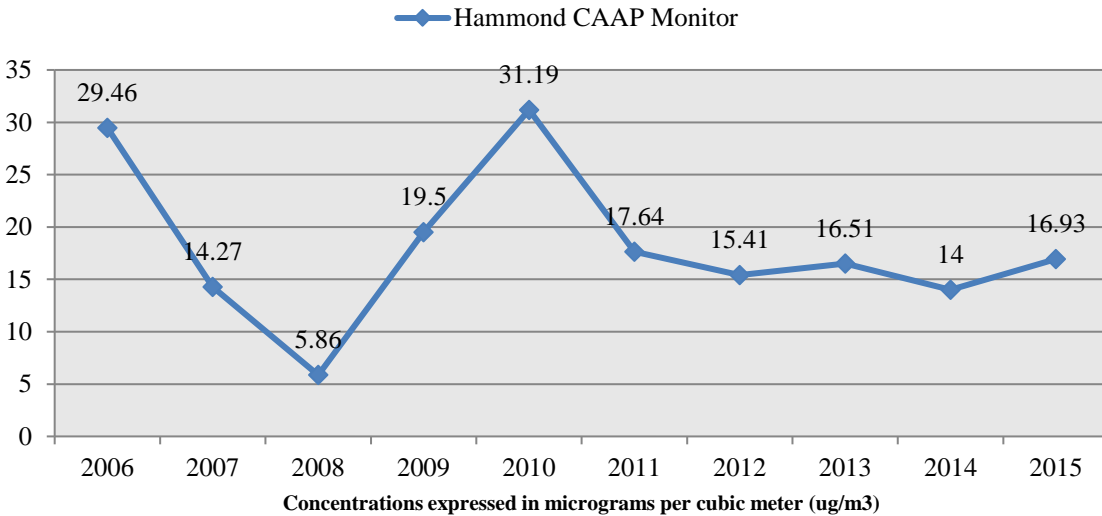
To learn more about the current monitoring locations, please visit IDEM's Air Toxics Monitor Siting webpage at: <http://www.in.gov/idem/toxic/2337.htm>

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

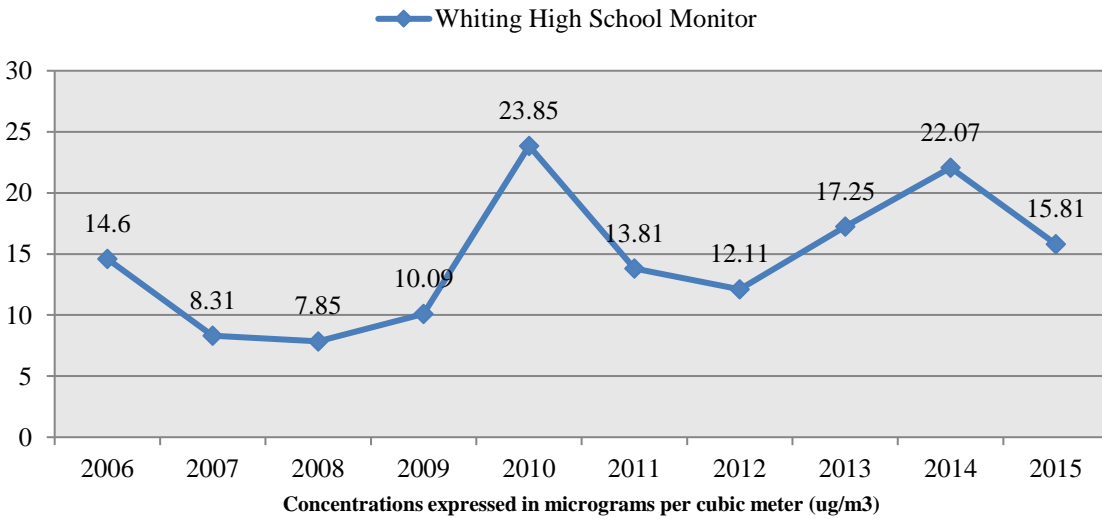
statewide detection rate of acetone for the monitors analyzed from 2006-2015 was 99.1%. Trend graphs for each of these monitors are provided below.



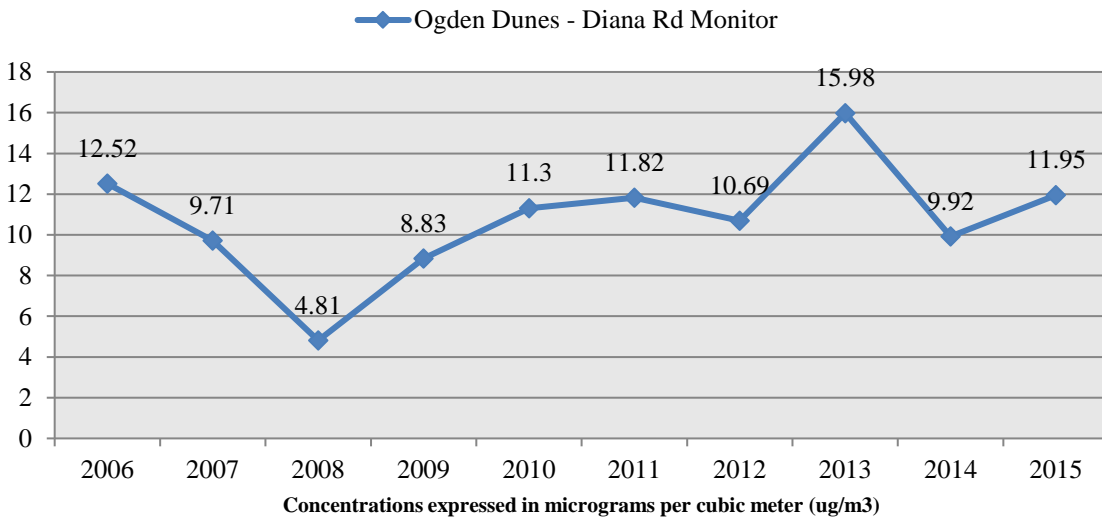
95% UCL Acetone Concentrations at Hammond (2006-2015)



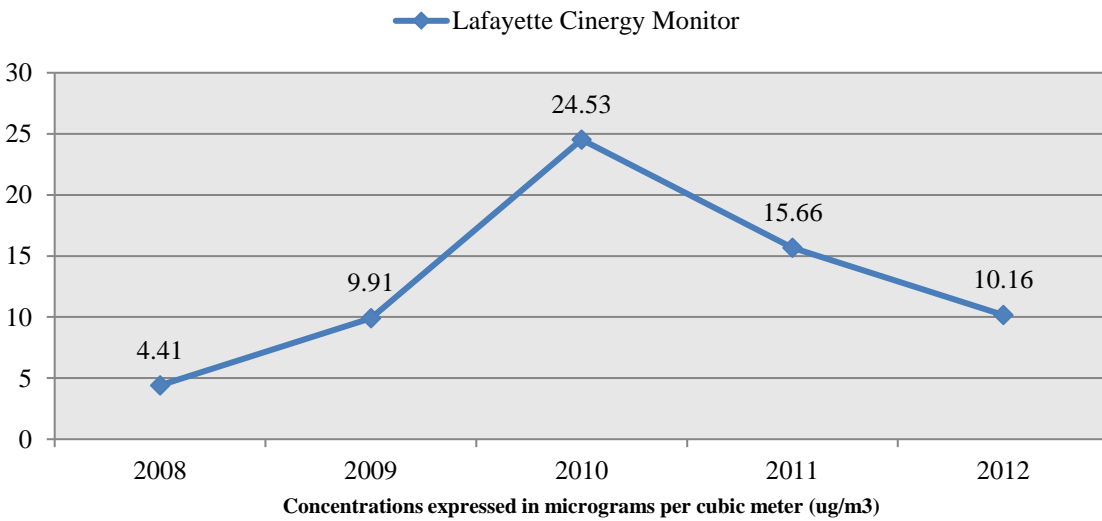
95% UCL Acetone Concentrations at Whiting (2006-2015)



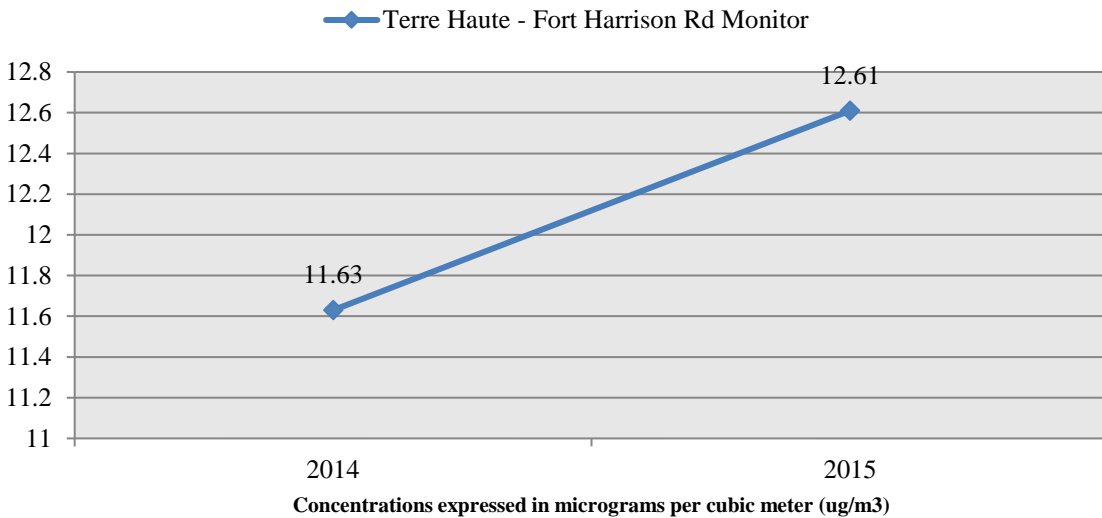
95% UCL Acetone Concentrations at Ogden Dunes (2006-2015)



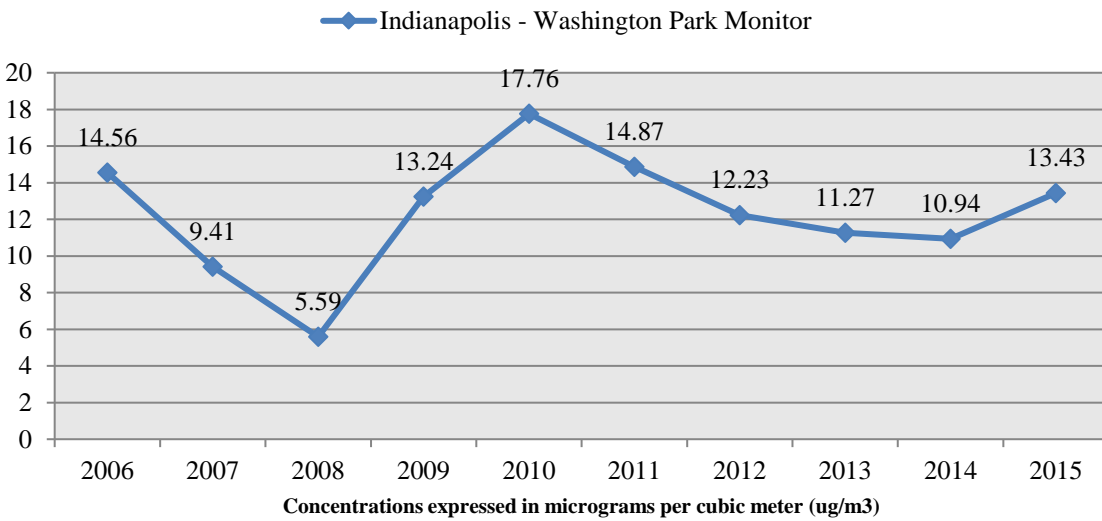
95% UCL Acetone Concentrations at Lafayette (2008-2012)



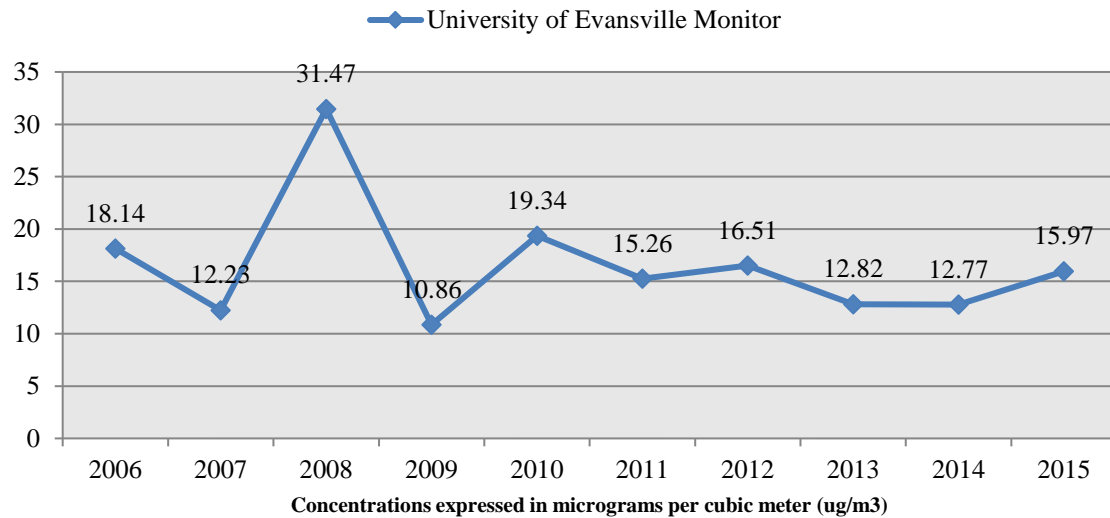
95% UCL Acetone Concentrations at Terre Haute (2014-2015)



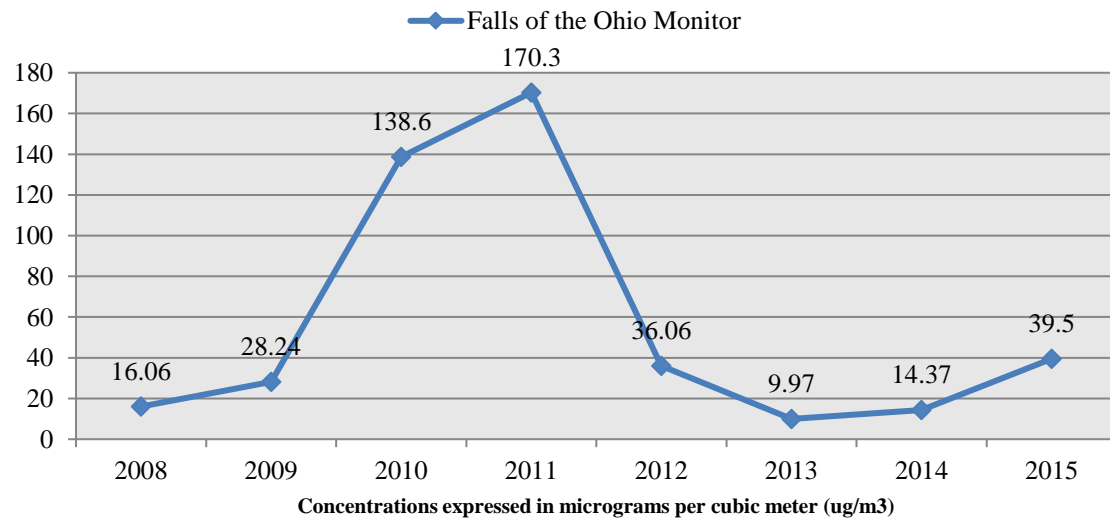
95% UCL Acetone Concentrations at Indianapolis (2006-2015)



95% UCL Acetone Concentrations at Evansville (2006-2015)



95% UCL Acetone Concentrations at Clarksville (2008-2015)



The analysis of monitoring data from 2006 to 2015 indicates that concentrations of acetone spiked for most monitors at varying times during the period of 2008-2011 and have declined since. The one exception is Ogden Dunes, which recorded its highest concentration during 2013. The highest concentrations in the state were recorded during 2010 and 2011 at the Clarksville monitor. Readings at this monitor have since declined significantly, although Clarksville did record the highest concentration in the state during 2015. The highest single reading for any

monitor was 858.16 recorded at Clarksville on 9/23/2010. This reading is still well below the Reference Concentration of 31000.00. 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 acetone 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 well below 1.0 at all monitors, which indicates that the measured concentrations of acetone do not present a risk for non-cancer health effects.

Table 1. Acetone 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	16.87	31000.00	0.0005
East Chicago Marina	2013-2015	12.58	31000.00	0.0004
Gary IITRI	2006-2015	10.93	31000.00	0.0004
Hammond CAAP	2006-2015	16.27	31000.00	0.0005
Whiting High School	2006-2015	13.30	31000.00	0.0004
Ogden Dunes – Diana Rd	2006-2015	9.85	31000.00	0.0003
Lafayette Cinergy	2008-2012	11.52	31000.00	0.0004
Terre Haute – Fort Harrison Rd	2014-2015	11.76	31000.00	0.0004
Indianapolis – Washington Park	2006-2015	11.24	31000.00	0.0004
University of Evansville	2006-2015	15.02	31000.00	0.0005
Clarksville – Falls of the Ohio	2008-2015	55.53	31000.00	0.0018

* Reference Concentration Source: Agency for Toxic Substances and Disease Registry

Cancer Risk

There is no evidence of increased cancer risk from exposure to acetone.