

METHYL n-BUTYL KETONE (C₆H₁₂O)

Chemical Abstracts Service (CAS) Number: 591-78-6

General Information

Methyl n-butyl ketone is a colorless liquid with an acetone-like odor. It dissolves very easily in water, and can evaporate easily into the air as a vapor. It can affect you when inhaled and may be absorbed through the skin. Acute (short-term) exposure to methyl n-butyl ketone may irritate the nose and throat and cause headache, dizziness, lightheadedness, and passing out. Chronic (long-term) exposure to methyl n-butyl ketone can cause drying and cracking of the skin with redness and rash. No information is available on the cancer risk of exposure to methyl n-butyl ketone.

Sources

- Methyl n-butyl ketone was used in the past in paint and paint thinner, to make other chemical substances, and to dissolve oils and waxes. It is no longer made or used in the United States because it has harmful health effects.
- It is formed as a waste product resulting from industrial activities such as making wood pulp and producing gas from coal, and in oil shale operations.

Indiana Emissions

No emissions of methyl n-butyl ketone were recorded from the National Emission Inventory (NEI) for the 2014 calendar year.

Measured Concentration Trends

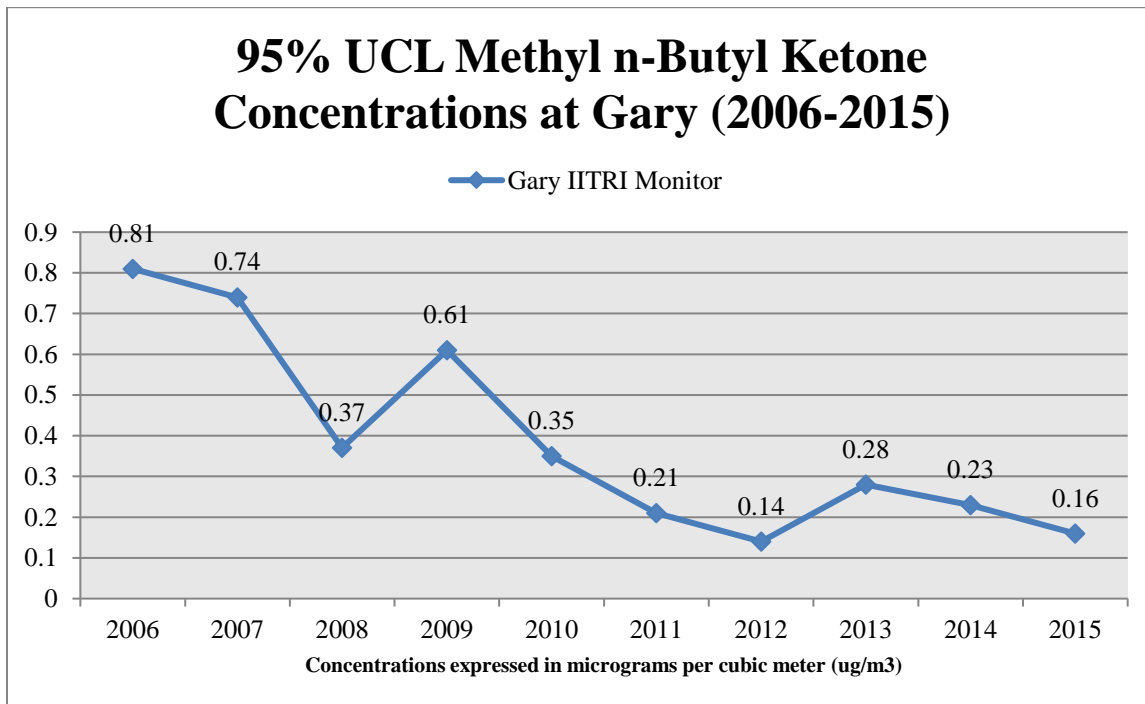
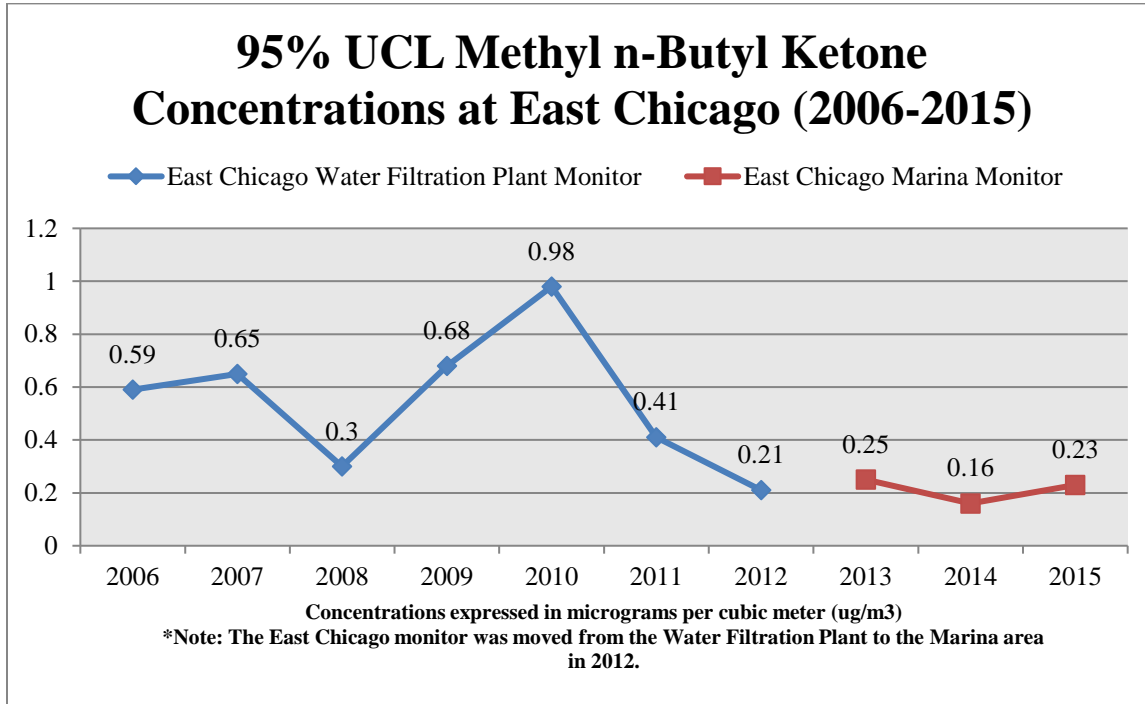
Ambient air monitoring data most accurately represents a limited area near the monitor location. All monitors for air toxics sample every sixth day. The monitoring locations by themselves are not sufficient to accurately characterize air toxic concentrations throughout the entire state, however, results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

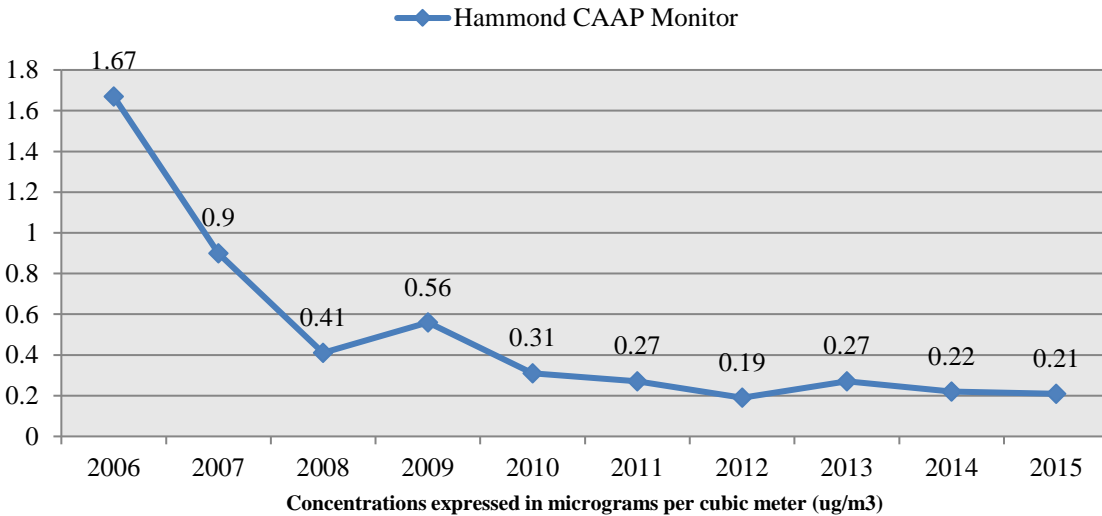
To learn more about the current monitoring locations, please visit IDEM's Air Toxics Monitor Siting webpage at: <http://www.in.gov/idem/toxic/2337.htm>

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

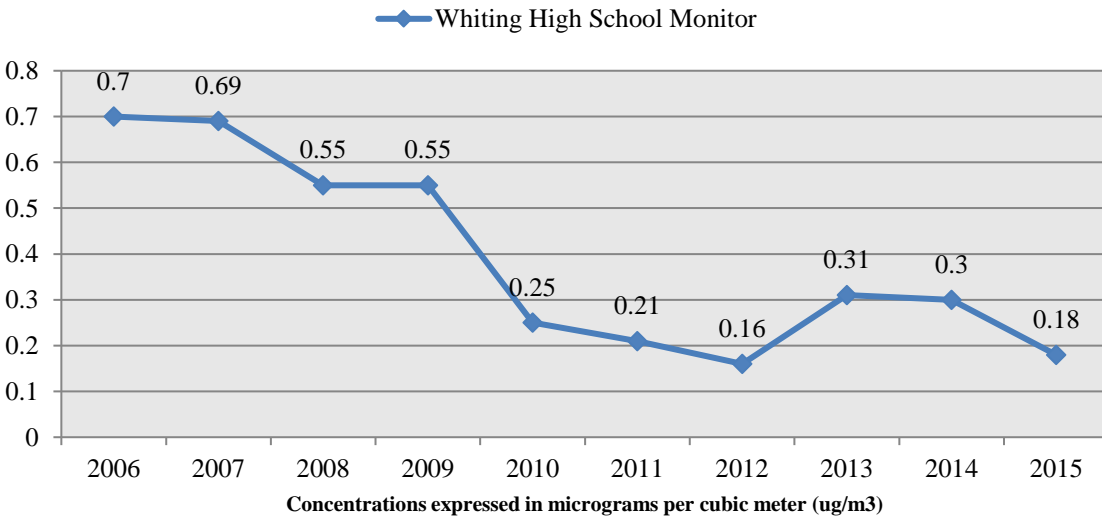
statewide detection rate of methyl n-butyl ketone for the monitors analyzed from 2006-2015 was 75.1%. Trend graphs for each of these monitors are provided below.



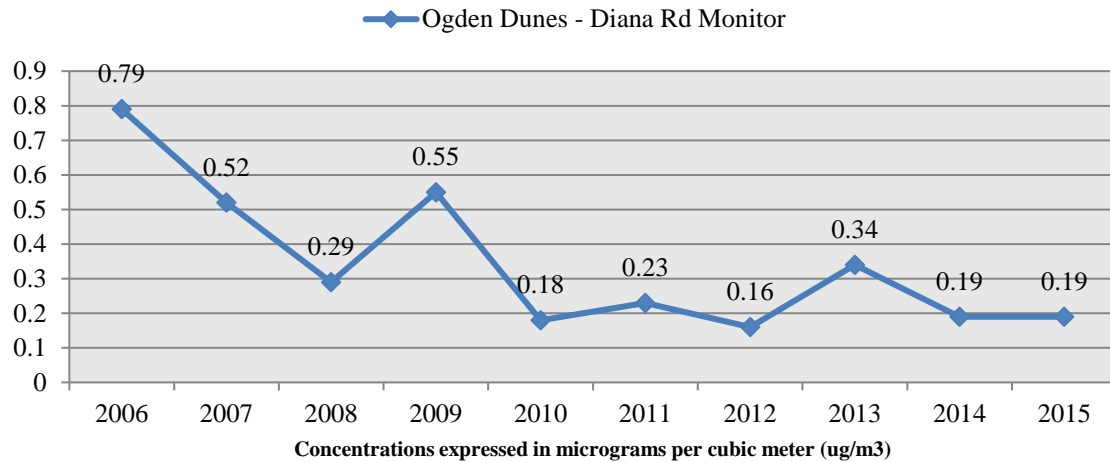
95% UCL Methyl n-Butyl Ketone Concentrations at Hammond (2006-2015)



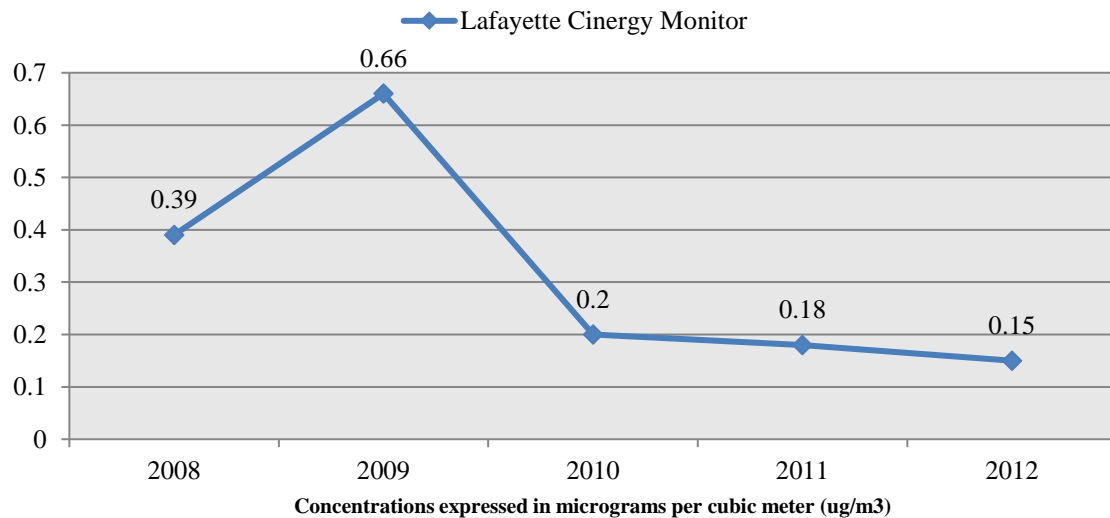
95% UCL Methyl n-Butyl Ketone Concentrations at Whiting (2006-2015)



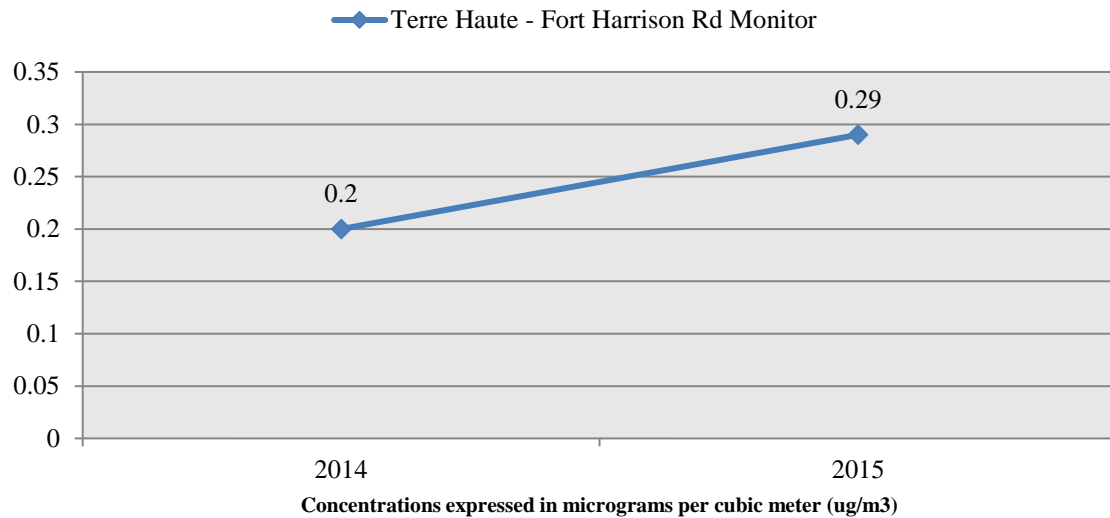
95% UCL Methyl n-Butyl Ketone Concentrations at Ogden Dunes (2006-2015)



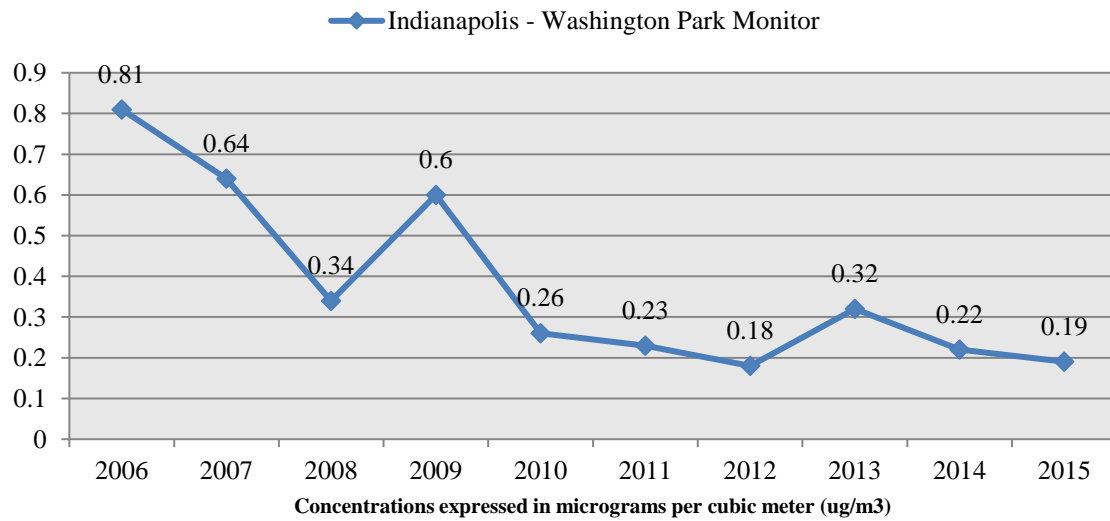
95% UCL Methyl n-Butyl Ketone Concentrations at Lafayette (2008-2012)



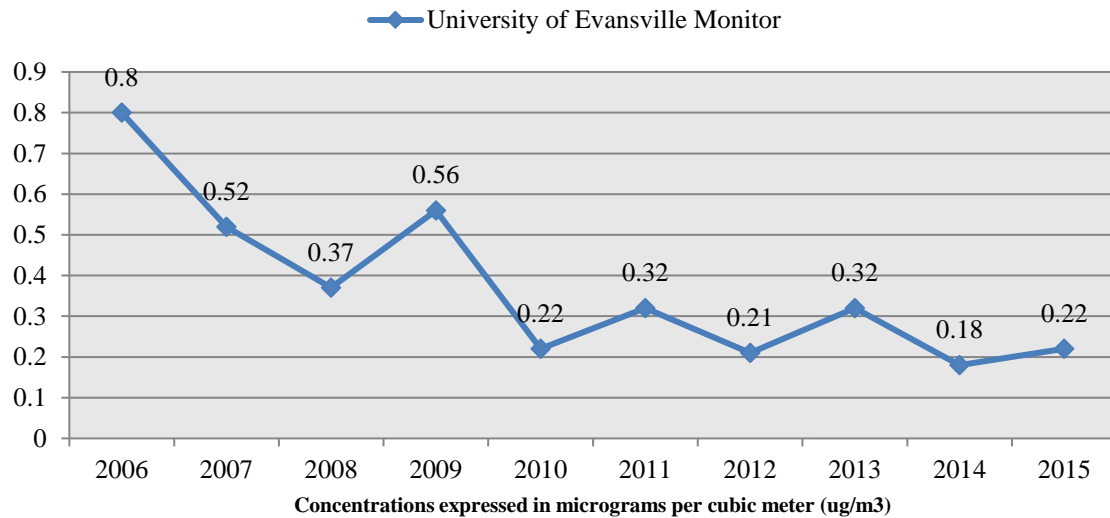
95% UCL Methyl n-Butyl Ketone Concentrations at Terre Haute (2014-2015)



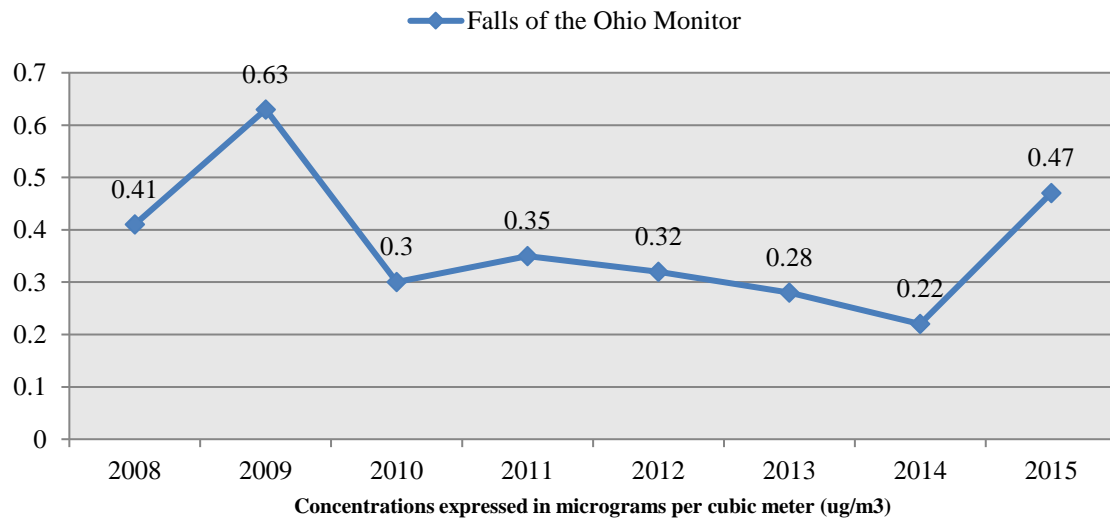
95% UCL Methyl n-Butyl Ketone Concentrations at Indianapolis (2006-2015)



95% UCL Methyl n-Butyl Ketone Concentrations at Evansville (2006-2015)



95% UCL Methyl n-Butyl Ketone Concentrations at Clarksville (2008-2015)



The analysis of monitoring data from 2006 to 2015 indicates that concentrations of methyl n-butyl ketone have generally declined throughout the state. The one exception is an increase in 2015 at Clarksville. The calculated concentration in this case was heavily skewed by an unusually high reading of 2.71 recorded on 8/16/2015. This reading appears to be an outlier in the data, and no pattern of consistently high readings could be found in the full 2015 data set.

The high reading of 2.71 is also well below the Reference Concentration of 57.00. 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 methyl n-butyl ketone 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 methyl n-butyl ketone do not present a risk for non-cancer health effects.

Table 1. Methyl n-Butyl Ketone 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	0.53	57.00	0.0093
East Chicago Marina	2013-2015	0.20	57.00	0.0035
Gary IITRI	2006-2015	0.36	57.00	0.0063
Hammond CAAP	2006-2015	0.46	57.00	0.0081
Whiting High School	2006-2015	0.36	57.00	0.0063
Ogden Dunes – Diana Rd	2006-2015	0.31	57.00	0.0054
Lafayette Cinergy	2008-2012	0.30	57.00	0.0052
Terre Haute – Fort Harrison Rd	2014-2015	0.24	57.00	0.0042
Indianapolis – Washington Park	2006-2015	0.34	57.00	0.0060
University of Evansville	2006-2015	0.32	57.00	0.0056
Clarksville – Falls of the Ohio	2008-2015	0.33	57.00	0.0058

* Reference Concentration Source: IDEM Office of Land Quality

Cancer Risk

There is no evidence at this time of increased cancer risk from exposure to methyl n-butyl ketone.