

US EPA ARCHIVE DOCUMENT

EPA Report  
Results of Odor Screening in Chanute, KS  
April 20, 2012

In response to community reports of episodic odors, the Environmental Protection Agency (EPA) and the Kansas Department of Health and Environment (KDHE) designed an odor monitoring campaign to sample and identify potential odor causing volatile organic compounds (VOCs) when odors were reported by the public to the KDHE spill line. In addition to the odor sampling, the EPA and KDHE are conducting ambient particulate monitoring, which is on-going<sup>1</sup> and will be discussed in a separate report.

**Executive Summary**

Analysis of all seven odor samples shows that VOCs are present in the samples at similar types and amounts. (see Table 1, Data Results) While similar to the levels found in other U.S. communities<sup>2</sup>, toluene was the VOC found at the highest concentration in the samples (see attached Figure 1) As a follow-up to the results of the data collected, an evaluation of sources of toluene emissions within the Chanute area was performed and the results of that evaluation are presented in this report. Our conclusion is the VOCs identified in the air sampling conducted from August 2011 to March 2012 are consistent with the amounts commonly found in urban outdoor air in the U.S.<sup>2</sup> However, an industrial source of toluene was identified and investigated, and found to be exceeding its emission limits for toluene. EPA and KDHE are working with the facility to reduce toluene emissions.

**Description of Odor Samples Collected**

From August 5, 2011, to March 2, 2102, KDHE staff collected seven odor samples and two background air samples in Chanute, Kansas, to investigate citizen complaints of odors in the area. The short duration, or “grab,” outdoor air samples were used to gather information about the presence or absence of chemicals possibly causing the odors and to determine their concentration. Table 1 summarizes the samples collected and the corresponding weather conditions on that date.

**Table 1. Sample Summary**

Date	Location	Wind Direction	Wind Speed (mph)	Temp (°F)	Humidity (%)
8/5/2011	Intersection of Ash & Forest	ESE	5	79	74
8/6/2011	Parking Lot N of 1625 S Santa Fe	ENE	2-3	83	70
8/26/2011	Intersection of Hwys 169 & 39	E	0 - 3	64	84
9/7/2011	4 <sup>th</sup> & Santa Fe	NNW	2-5	66	49

<sup>1</sup> For a complete description of the proposed environmental screening in Chanute, KS, the reader is referred to the “Chanute Air Monitoring Proposal” published on the EPA Region 7’s webpage <http://www.epa.gov/region07/air/quality/chanute.htm>.

<sup>2</sup> <http://www.atsdr.cdc.gov/ToxProfiles/TP.asp?id=161&tid=29#bookmark08>

Date	Location	Wind Direction	Wind Speed (mph)	Temp (°F)	Humidity (%)
9/14/2011	150' W of Intersection of Hwys 169 and 39	NE	5 - 10	62	70
9/28/2011	75' N of Oak St on Plummer	E	0 - 2	60	80
11/14/2011	Lincoln & 39 Hwy	SW	10	63	32
12/4/2011	SE Corner Ash & Forest	NNE	2	32	32
3/2/2012	6 <sup>th</sup> St, between Central & Malcolm	NNE	10 -15	51	45

Air sampling in Chanute began with the collection of two background air samples. The purpose of the background samples was to measure the types and amounts of the chemicals found in the outdoor air in Chanute on days when no odor was present and when there were no known industrial releases in the area. The samples were obtained in two different locations. The first location was at the southeast corner of Ash and Forest Streets and the second was at the parking lot north of 1625 South Santa Fe. These two samples were taken one day apart at similar times of the day and under similar meteorological conditions. The first background sample was taken on August 5<sup>th</sup> between 9:50 and 9:54 AM. The winds were at 5 mph from the east-southeast with a temperature of 79 degrees. The second background sample was taken on August 6<sup>th</sup> between 9:57 AM and 10:00 AM. The winds were relatively calm at 2 to 3 mph out of the east-northeast. Similar to the previous day, the temperature was 83 degrees.

A total of seven air samples were collected immediately following odor complaints received from the community. Two of these samples were collected on days with winds predominantly from the east. These samples were taken about one month apart, one on August 26<sup>th</sup> and the other on September 28<sup>th</sup>. The meteorological conditions were nearly identical on these two days with near calm winds and temperatures in the low sixties. Both of the complaints received on these days indicated that the odor could be detected at the intersection of Highways 169 and 39. The August sample was taken at the northeast corner of the Highways 169 and 39 intersection, but the KDHE staff tasked with collecting the sample did not detect an odor during sample collection. The September sample was acquired on Plummer Street, 75 feet north of the Oak Street intersection. The KDHE staff drove east and south from the intersection of Highways 169 and 39, the location where the odor was reported, and collected the sample at the nearest site where they were able to detect a slight odor.

Another two samples were collected on September 14<sup>th</sup> and December 4<sup>th</sup> when the wind was from the northeast. The September 14<sup>th</sup> sample was taken in response to an odor complaint received that morning. The complaint indicated that the odor was just west of the intersection of Highways 169 and 39. The sample was taken where the complaint indicated the odor was located; however, the KDHE staff did not detect any odor at the time of sampling. The winds that day were 5 to 10 mph from the northeast and the temperature was 62 degrees. These meteorological conditions were similar to that recorded on August 26<sup>th</sup> and September 28<sup>th</sup>,

except that winds were easterly, and the complaints received on September 14<sup>th</sup> and December 4<sup>th</sup> indicated that the odor was in the same general area as reported for the August 26<sup>th</sup> and September 28<sup>th</sup> samples. The December 4<sup>th</sup> sample was taken in response to a complaint indicating that there was a dark plume being emitted from the Ash Grove facility and blowing south over Chanute. The sample was taken at the same location as the first background sample. Neither the KDHE staff nor the person filing the complaint indicated an odor; however, the KDHE staff confirmed the observation of a dark plume being emitted from the Ash Grove facility. The winds were near calm, at 2 mph from the north-northeast, and the temperature was 32 degrees.

On September 7<sup>th</sup>, a complaint was received indicating an odor near the rail yard west of the intersection of 4<sup>th</sup> and Santa Fe Streets. The winds that day were out of the north-northwest at relatively calm speeds of 2 to 5 mph. The temperature of 66 degrees that day was similar to that of the temperatures on the previously mentioned days on which odor complaints were received. The sample was taken west of the intersection of 4<sup>th</sup> and Santa Fe, and the KDHE staff detected a slight petroleum odor. The person filing the complaint had indicated the possibility of the odor coming from the rail yard. The railcars that could be observed from the sampling site were unit train-type coal hopper cars and cement hopper cars.

A complaint was received on November 14<sup>th</sup> when winds were from the southwest and the temperature was 63 degrees, which is similar to that of the days on which other odor complaints were received. The complaint indicated the odor was located near the Chanute Post Office, so the sample was collected at the intersection of Elm Street and Lincoln Street across from the post office, which is a fairly high traffic location. The KDHE staff detected a slight odor like that of burning rubber.

On March 2, 2012, a complaint was received regarding odors noted between 5<sup>th</sup> and 6<sup>th</sup> Streets, and between Central and Malcolm Streets. KDHE staff did not detect odors at these locations, but collected a sample on 6<sup>th</sup> Street between Central and Malcolm. On this date, winds were 10 to 15 mph from the north-northeast, the temperature was 51 degrees, and the humidity was 45%. The complainant noted that the odors on this date had left a "metallic taste" in his mouth all day.

There were two dates on which complaints received but no samples taken. On August 15<sup>th</sup> a complainant alleged that there was material from the Ash Grove facility's stack on a driveway. The driveway was inspected and both the KDHE staff and the homeowner agreed that the material looked like red clay. Because it was agreed between KDHE and the homeowner (who was not the complainant) that the material was likely clay, and not material from Ash Grove, no sample was taken at this location. On August 29<sup>th</sup> an odor was reported near the intersection of Highways 169 and 39. No sample was taken in response to this complaint because by the time KDHE staff had arrived at the scene of the report, no odor was detected, and three of seven air samples previously collected were in the vicinity of this location. The winds on this day were from the south.

Four of eight verified complaints received were on days with easterly winds and the odor was noted in the vicinity of the intersection of Highways 169 and 39. All of the days on which

odor complaints were received had temperatures in the low to mid-sixties. Four of the seven odor complaints came from the western edge of Chanute with only two complaints from the eastern side of the city. Both of the complaints of odors reported on the eastern side of the city occurred when the wind had a westerly component.

### **Evaluation of Analytical Results**

The outdoor air samples collected were based upon odor complaints reported to the KDHE spill line. Table 2 (attached) contains the analytical results for the odor samples. The samples were of a short duration in order to sample the reported odor to obtain information regarding the presence or absence of VOCs during odor events. The chemical with the highest amount detected was toluene. Toluene was detected in the odor samples collected on August 26 and September 28, 2011, at concentrations of 5.14 and 27.6 parts-per-billion by volume (ppbv). The winds were out of the east on these dates, the meteorological conditions were similar, and the complainants in both cases stated that the odors were detected in the vicinity of the intersection of Highways 169 and 39. The largest source of toluene release to the environment is from the production, transport, and use of gasoline, which contains about 5 – 7 % toluene by weight<sup>2</sup>. Toluene is also used in paints, lacquers, inks, adhesives, rubber, and cleaning agents. The primary industrial sources of toluene include oil refineries, the chemical industry, rubber manufacturers, the pharmaceutical industry and manufacturers of paints, varnishes and lacquers. It is also emitted in metal degreasing and printing. Some toluene is found in vehicle exhaust.

Other VOCs detected in the samples at levels greater than the amounts found in the background samples include: carbon disulfide, found at 0.011 ppbv; methyl ethyl ketone (MEK), found at 1.11 ppbv; methyl isobutyl ketone (MIK), found at 0.094 ppbv; tetrachloroethylene (PCE), found at 0.026 ppbv; and trichloroethylene (TCE), found at 0.178 ppbv. All of these chemicals are common solvents used in industrial processes or commercial and household products. MEK is used in the welding of plastics. MIK is a common solvent for lacquers and certain polymers and resins. PCE is a common solvent used in drycleaning, but also may be found in a few consumer products used for spot removal, automotive parts degreasing and in paint strippers. TCE is also a common industrial solvent with many uses from the extraction of caffeine from coffee to metal parts degreasing. Both PCE and TCE may be produced as a by-product of automobile emissions in the environment. Carbon disulfide is a common grain fumigant and is used in insecticides. All of these VOCs were detected in amounts found in urban outdoor air.

While the level of toluene in the Chanute air samples is similar to the levels found in other U.S. communities<sup>2</sup>, EPA investigated possible industrial sources of toluene emissions in Chanute. Based on information reported by facilities to KDHE, Hi-Lo (Hi-Lo) Industries and HBD/Thermoid, Inc. (HBD) are the largest sources of toluene emissions in the Chanute area. In 2010, the Hi-Lo facility reported the release of 2.76 tons per year (tpy) of toluene to the Kansas Emissions Inventory, while HBD reported 14.72 tpy and Ash Grove Cement reported 0.01 tpy.

## Toluene Emissions Inventory – Chanute, Kan.

\* Data taken from the 2010 Kansas Emissions Inventory and the EPA Toxic Release Inventory

Facility Name	Unit	Process	Poll Name	2010 Emissions (tons) KEI	2010 Emissions (tons) TRI
HI-LO INDUSTRIES, INC.	001	1.00	XYLENE	2.98	
HI-LO INDUSTRIES, INC.	001	1.00	TOLUENE	2.76	
HBD/Thermoid, Inc.	002	2.00	TOLUENE	13.08	38.26
HBD/Thermoid, Inc.	003	1.00	TOLUENE	1.28	
HBD/Thermoid, Inc.	003	2.00	TOLUENE	0.36	
ASH GROVE CEMENT COMPANY	002	23.00	BENZENE	0.00	
ASH GROVE CEMENT COMPANY	002	23.00	TOLUENE	0.01	<0.10
ASH GROVE CEMENT COMPANY	002	23.00	XYLENE	0.03	

EPA conducted a Full Compliance Evaluation of Hi-Lo Industries on December 15, 2011. No violations of toluene emission limits were identified during the inspection of Hi-Lo.

HBD was also inspected and a Finding of Violation (FOV) was issued to HBD on January 11, 2012, for exceeding permitted toluene air emission limits. EPA and KDHE are working with HBD to address those findings.

Ash Grove Cement is inspected for compliance with air regulations approximately four times per year by KDHE. The most recent KDHE inspection of Ash Grove Cement was conducted on January, 27, 2012. No violations were identified by the inspector during the most recent inspection.

### **Conclusion**

The objective of the odor monitoring campaign in Chanute was to identify potential odor causing VOCs as soon as possible after they were reported by the public. Two background and seven complaint samples were collected and analyzed over a nine month period. Toluene was the VOC with the highest concentration in the samples (see Figure 1, attached). Given that the VOCs identified in the air sampling conducted from August 2011 to March 2012 have been found to be consistent with the amounts commonly found in urban outdoor air in the U.S. <sup>2</sup>, the intent of the odor screening study has been met and this study completed.

Attachment