

Letter Health Consultation

STACKYARD HOLLOW SITE

WHEELING, WEST VIRGINIA

JUNE 5, 2015

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR TOLL FREE at
1-800-CDC-INFO

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

LETTER HEALTH CONSULTATION

STACKYARD HOLLOW SITE

WHEELING, WEST VIRGINIA

Prepared By:

U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Eastern Branch Headquarters



Agency for Toxic Substances and
Disease Registry, Region 3
1650 Arch Street, 3HS00
Philadelphia, PA 19103

OSC Deborah Lindsey
U.S. Environmental Protection Agency Region 3
Wheeling Operations Office
303 Methodist Building
11th and Chapline Streets
Mail Code: 3HS32
Wheeling, WV 26003

June 5, 2015

Dear OSC Lindsey:

On January 5, 2015, you requested that the Agency for Toxic Substances and Disease Registry (ATSDR) complete a health consultation evaluating residential indoor air data collected during and after emergency response activities at the Stackyard Hollow site in Wheeling, WV. This site consists of a four-unit apartment building constructed "slab-on-grade" and situated atop an abandoned gas/oil production wellhead. The apartment building is currently occupied by adults in three apartment units. The wellhead is located in the unoccupied first floor apartment unit. This letter health consult assesses the public safety risk from the detection of flammable vapors inside the residential apartment building at this site.

Given the current temporary nature of well vapor control measures taken at this site and the ongoing indoor air detections of volatile organic compounds (VOCs) and lower explosive limit (LEL) readings during intermittent air monitoring by EPA, ATSDR concludes that the intermittent detection of flammable gasses inside the building represents a **public health hazard**.

- Based on the information available, ATSDR recommends that the involved agencies work with the property owner to have residents vacate the residential property at this site as soon as possible.
- Until a permanent remedy is in place, ATSDR recommends continued regular monitoring of indoor air for VOCs and LEL ensure the safety of the property and properties around the building.
- Further, based on limited information received about previous similar problems in the neighborhood (i.e. other improperly abandoned and historical venting oil/gas production wells), further discussions about characterization of this risk in the area by state and local authorities is recommended.

A subsequent letter health consultation will provide ATSDR's public health review of the 24-hour indoor air sampling results collected at this site by EPA in November 2014. ATSDR appreciates and acknowledges the work the U.S. Environmental Protection Agency (EPA) and state and local agencies have already completed to date at this site, which have reduced apartment occupants' exposures to contaminants at this location.

Background and Statement of Issues

In June 2014, West Virginia Department of Environmental Protection (WVDEP) responded to a report of odors inside an apartment building and an oil sheen in a nearby culvert. After the building owner drilled a hole in the building's slab to further explore the source of odors in his building, the abandoned well began "bubbling up liquids and venting gasses" into an unoccupied 1st floor apartment in the fall of 2014. WVDEP requested EPA removal program assistance in evaluating and mitigating this concern. EPA and WVDEP confirmed the presence of strong odors and conducted field monitoring with handheld instruments that detected VOCs and flammable gasses (by LEL meter) inside the first floor unit with the oil and gas wellhead. VOCs were also detected on the upper floor.

The environmental agencies worked with oil and gas field experts from the state and the building owner to install temporary engineering controls that exhaust oil/gas well vapors to outside the building above the roofline (via wellhead cap and vent pipe). The threat of explosion from the build-up of flammable gasses inside the apartment building was reduced, but not eliminated. Post-mitigation intermittent monitoring indicates vapors/gasses are still occasionally present inside the first floor unit in the area immediately adjacent to the wellhead that are at times at levels of safety concern. Since October 2014, flammable gases have only been monitored and detected in the unit with the wellhead.

Air monitoring for total VOCs and a lower explosive limit (LEL) atmosphere

During the initial response in September 2014, WVDEP and EPA both conducted air monitoring for total VOCs and LEL with hand-held instruments inside the apartment building. These air monitoring data indicated an immediate safety hazard was present due to the buildup of flammable gasses inside the unit with the wellhead (as determined by LEL meter). Hand-held instrument monitoring also indicated the presence of total VOCs. The hand-held monitors used at this site are useful in identifying immediate safety hazards and the qualitative presence of chemicals in air, but are insufficient for quantitatively assessing the toxic risks of the individual chemicals making up the total VOCs reading. The two attached tables provide the results from the handheld monitoring conducted at two to five day intervals inside the unit with the wellhead and outside the subject building between September 2014 and May 2015. Over approximately 70 days of handheld monitoring (approximately 50 of which included monitoring at the wellhead), there were detectable levels of flammable gases on the LEL meter 21 times in the area immediately adjacent to the base of the wellhead. Following any LEL detections, EPA took immediate steps to reduce the presence of flammable gases until all readings returned to zero each time. There were no LEL detections in any of the other monitoring locations after September 29, 2014.

In September 2014, the environmental agencies worked with oil and gas field experts from the state and the building owner to cover the oil and gas well and install ventilation to remove flammable vapors from the building. The VOC and LEL indoor air levels decreased after taking these initial steps. Intermittent field air monitoring by EPA between September 2014 and April 2015 indicate that total VOCs are still present inside the unit with the wellhead. VOCs have been detected on each

monitoring round, ranging from non-detect to 266 parts per million (ppm) at the wellhead, even with temporary ventilation in place. Post-mitigation LEL levels, while fluctuating, have remained below 8% of the LEL (10-15% of the LEL is the level where immediate response actions or evacuation are recommended) in all locations with two exceptions. On two occasions, monitoring directly next to the wellhead recorded readings in excess of 15 percent of the LEL (March 31, 2015 at 15% and April 13, 2015 at 17%). The detection of VOCs and flammable gasses inside the building continues to be recorded by hand-held instruments and have on two occasions approached levels where additional mitigation or evacuation is recommended. Following detections of LEL in excess of 15% in April, the EPA took additional measures to address these detections near the wellhead. On April 21, 2015, the EPA re-set the vent stack and re-packed the seal around the wellhead. EPA notes that these actions improved the seal between the wellhead and vent stack and air monitoring since that time shows no detectable levels of flammable gasses by LEL monitoring.

VOCs continue to be released into the unit with the wellhead, even after installing a temporary cap venting the gasses from the wellhead to outdoors. The risks have not been eliminated and the potential for fire/explosion and chemical exposures remain.

Conclusions

Given the current temporary nature of the engineering control measures taken at this site and the ongoing indoor air LEL and total VOC readings, ATSDR concludes that the intermittent detection of flammable gasses inside the building represents a **public health hazard**. The apartments should not be occupied.

ATSDR concurs with EPA efforts to achieve a permanent solution that both eliminates exposures to the gasses being produced by the well and the potential explosion risk from vapor accumulation inside this building.

Recommendations

Based on the information available, ATSDR recommends that the involved agencies work with the property owner to have residents vacate the building as soon as possible. Until a permanent remedy is in place, ATSDR recommends continued regular monitoring of indoor air for VOCs and LEL ensure the safety of the property and properties around the building.

ATSDR recommends that indoor air test results show that the permanent remedy is protective prior to building reoccupancy. ATSDR is available to review any post-remedy air sampling approach(es) in concert with state and local health authorities and provide public health feedback on the results.

Further, based on limited information received about previous similar problems in the neighborhood (i.e. other improperly abandoned and historical venting oil/gas production wells), further discussions about characterization of this risk in the area by state and local authorities is recommended.

We will provide a health evaluation of the 24-hour indoor air sampling for VOCs in a subsequent letter health consultation. If you have additional questions or need further clarification on our conclusions or recommendations, please do not hesitate to contact me.

Sincerely,



Robert Helverson
Environmental Health Scientist
ATSDR Region 3 Representative
Philadelphia, PA
(215) 814-3139 (Office)
gfu6@cdc.gov



Lynn Wilder
Associate Director for Science
Division of Community Health Investigations
ATSDR
Atlanta, GA

cc: Fran Burns, EPA R3 Western Branch Chief, Hazardous Site Cleanup Division
Michael Towle, EPA R3 On-Scene Coordinator, Hazardous Site Cleanup Division
Howard Gamble, Wheeling-Ohio County Health Department
Lock Johnson, Wheeling-Ohio County Health Department
Tony Turner, WV Bureau for Public Health
Dr. Sharon Williams-Fleetwood, ATSDR DCHI Eastern Branch Chief

Attachment

EPA Air Monitoring Summary Tables For Stackyard Hollow Site

Air Monitoring Summary at the Stackyard Hollow Site

Min Max	Location 1 Exterior Outside Unit A Door Closed Breathing Level		Location 2 Exterior Unit C & D Entrance Rear of Apartment Breathing Level		Location 3 Exterior Rear of Apartment Roof Level ~ 6 ft Under Vent		Location 4 Exterior Rear of Apartment 1st Floor Window Behind Unit A		Location 5 Exterior Rear of Apartment 1st Floor Corner Behind Unit B	
	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC
	0	0	0	0	0%	0	0%	0	0	0
DATE	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC
9/12/14			2%	1.5 ppm			85%	1.3		
9/13/14							0	0.5		
9/15/14	0	2.1	0	0.9	0	2.1 - 8.9	0	12.7 - 14.3		
9/16/14	0	0.1 ppm	0	0.2	0	1.5	0	2.7	0	1.1
9/17/14	0	0	0	0	0	0	0	0	0	0
9/18/14	0	0	0	0	3%	0	0	0.2	0	0
9/19/14	0	0	0	0	3%	0	0	0	0	0
9/22/14	0	0	0	0	0	0	0	0	0	0
9/24/14	0	0	0	0.2	1 - 2%	0.1	0	0.2	0	0.6
9/25/14	0	0	0	0	0	0	0	2.3	0	0.6
9/26/14	0	0	0	0	0	0	3%	3	0	0
9/29/14	0	0	0	0	3%	0	0	0	0	0
10/1/14	0	0	0	0	0	0	0	0.2	0	0
10/3/14	0	0	0	0	0	0	0	0	0	0
10/6/2014	0	0	0	0	0	0	0	0	0	0
10/8/2014	0	0	0	0	0	0	0	0	0	0
10/10/2014	0	0	0	0	0	0	0	0	0	0
10/13/2014	0	0	0	0	0	0	0	0	0	0
10/16/14	0	0	0	0	0	0	0	0	0	0
10/20/2014	0	0.1	0	0	0	0	0	0	0	0
10/23/2014	0	0	0	0	0	0	0	0	0	0
10/27/2014	0	0	0	0	0	0	0	0	0	0
10/29/2014	0	0	0	0	0	0	0	0	0	0
10/31/2014	0	0	0	0	0	0	0	0	0	0
11/3/2014	0	0	0	0	0	0	0	0	0	0
11/13/2014	0	0	0	0	0	0	0	0.2	0	0
11/17/2014	0	0.1	0	0	0	0	0	0.1	0	0.1
11/20/2014	0	0	0	0.1	0	0	0	0.1	0	0
11/24/2014	0	0	0	0	0	0	0	0	0	0
11/26/2014	0	0	0	0	0	0	0	0	0	0
12/1/2014	0	0	0	0	0	0	0	0	0	0
12/4/2014	0	0	0	0	0	0	0	0	0	0
12/8/2014	0	0	0	0	0	0	0	0	0	0
12/11/2014	0	0	0	0	0	0	0	0	0	0
12/15/2014	0	0	0	0	0	0	0	0	0	0
12/18/2014	0	0	0	0	0	0	0	0	0	0
12/22/2014	0	0	0	0	0	0	0	0	0	0
12/27/2014	0	0	0	0	0	0	0	0	0	0
12/30/2014	0	0	0	0	0	0	0	0	0	0
1/2/2015	0	0	0	0	0	0	0	0	0	0
1/5/2015	0	0	0	0	0	0	0	0.1	0	0.1
1/8/2015	0	0	not monitored		not monitored		0	0	0	0
1/12/2015	0	0	0	0	0	0	0	0	0	0
1/15/2015	0	0	0	0	0	0	0	0	0	0
1/20/2015	0	0	0	0	0	0	0	0	0	0
1/22/2015	0	0	0	0	0	0	0	0	0	0
1/26/2015	0	0	0	0	0	0	0	0	0	0
1/30/2015	0	0	0	0	0	0	0	0	0	0
2/3/2015	0	0	0	0	0	0	0	0	0	0
2/9/2015	0	0	0	0	0	0	0	0	0	0
2/11/2015	0	0	0	0	0	0	0	0	0	0
2/18/2015	0	0	not monitored		not monitored		0	0	0	0
2/26/2015	0	0	not monitored		not monitored		0	0.2	0	0
3/2/2015	0	0	0	0	0	0	0	0	0	0
3/6/2015	0	0	0	0	0	0	0	0	0	0
3/9/2015	0	0	0	0	0	0	not monitored		0	0
3/12/2015	0	0.1	0	0.2	0	0	0	0.7	0	0.2
3/16/2015	0	0	0	0	0	0	not monitored		0	0
3/20/2015	0	0	0	0.3	0	0	0	0.5	0	0.1
3/24/2015	0	0	0	0	0	0	0	0.2	0	0.1
3/31/2015	0	0	not monitored		not monitored		not monitored		0	0.1
4/2/2015	0	0	0	0	0	0	not monitored		0	0.1
4/7/2015	0	0	0	0	0	0	0	0	0	0
4/10/2015	0	0	0	0	0	0	0	0.1	0	0
4/13/2015	0	0	0	0.1	0	0	0	0.2	0	0.2
4/15/2015	0	0	not monitored		not monitored		0	0.1	0	0.1
4/16/2015	0	0	0	0	0	0	0	0	0	0
4/20/2015	0	0	0	0	0	0	0	0	0	0
4/21/2015	0	0	0	0	0	0	0	0.2	0	0
4/23/2015	0	0	0	0	0	0	0	0	0	0.2
4/27/2015	0	<0.5	0	<0.5	0	<0.5	0	<0.5	0	<0.5
4/29/2015	0	0	0	0	0	0	0	0	0	0
5/1/2015	0	0	0	0	0	0	0	0	0	0
5/4/2015	0	<0.2	0	<0.2	0	<0.2	0	<0.2	0	<0.2
5/7/2015	0	<0.2	0	<0.2	0	<0.2	0	<0.2	0	<0.2
5/14/2015	0	0	0	0	0	0	0	0	0	0
5/18/2015	0	<0.5	0	<0.5	0	<0.5	0	<0.5	0	<0.5

not part of monitoring program for those dates

Air Monitoring Summary at the Stackyard Hollow Site

Min Max	Location 6 Interior Front Room Breathing Level		Location 7 Interior Back Room Well Head Area Breathing Level		Location 8 Interior Utility Closet near Hot Water Heater		Location 9 Well Head Base Left Side		Location 10 Well Head Base Right Side	
	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC
	0	0	0	0	0	0	0	2.1	0	1.6
	2	4.4	2	10.5	0	3.7	8	266	17	145
DATE	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC	LEL	VOC
9/12/14			2%	1.7						
9/13/14			4%	8						
9/15/14	0	4.2	0	20	0	12.9				
9/16/14	not monitored		0	2.2	0	12.9				
9/17/14	0	1.5	0	5	0	0				
9/18/14	0	0.4	0	3.1	0	0.7				
9/19/14	0	0.6	0	1.8	0	0.7				
9/22/14	0	4.2	0	10.5	0	3.7				
9/24/14	0	0.4	0	2.5	0	0.5				
9/25/14	0	3.3 - 4.4	0	10	0	2.7				
9/26/14	2	0.4	2	3.1	0	0.1				
9/29/14	0	0	2	2.4	0	0				
10/1/14	0	0	0	6	0	0.1				
10/3/14	0	0.1	0	0.4	0	0.1				
10/6/2014	0	0	0	0.1	0	0				
10/8/2014	0	0.1	0	0.4	0	0.1				
10/10/2014	0	0	0	0.4	0	0				
10/13/2014	0	0	0	0	0	0				
10/16/14	0	0	0	0.3	0	0				
10/20/2014	0	0.1	0	0.3	0	0.1				
10/23/2014	0	0	0	0.4	0	0	0	17.5	0	2.2
10/27/2014	0	0	0	0	0	0	3	45.1	0	22.4
10/29/2014	0	0.1	0	0.6	0	0.1	3	20.6	0	4.6
10/31/2014	0	0	0	0	0	0				
11/3/2014	0	0	0	2.4	0	0	0	17.2	0	13.5
11/13/2014	0	0.7	0	1.2	0	0.7	0	2.1	0	1.6
11/17/2014	0	0.3	0	0.4	0	0.3	0	2.6	0	1.9
11/20/2014	0	1.3	0	1.6	0	1.2	0	28.2	0	21.1
11/24/2014	0	1.1	0	1.1	not monitored		8	266	8	145
11/26/2014	0	1.5	0	1.9	0	1	0	19.9	0	20.6
12/1/2014	0	2	0	2.1	0	1.8	0	34.3	5	79.4
12/4/2014	0	3.2	0	7	0	0.9	3	54	0	7
12/8/2014	0	2	0	6	0	6	3	58	not monitored	
12/11/2014	0	1.5	0	2	0	1.8	0	19	not monitored	
12/15/2014	0	2	0	4	0	1.4	3	33	not monitored	
12/18/2014	0	1.1	0	1.3	0	1	3	10.6	3	11.4
12/22/2014	0	2.4	0	3	0	2	0	33		
12/27/2014	0	1.5	0	1.6	0	1.4	4	28.8	2	22.4
12/30/2014	0	1.3	0	1.8	0	1.6	5	35.8	3	28.1
1/2/2015	0	1.6	0	2.1	0	1.5	3	12	2	17.9
1/5/2015	0	1.4	0	1.4	0	1	0	9.7	0	5.9
1/8/2015	0	1.2	0	1.2	0	1	0	9.6	0	5.9
1/12/2015	0	1.3	0	3.8	0	1.6	0	5.9	0	6.7
1/15/2015	0	0.6	0	1.5	0	0.6	0	4.4	4	3.6
1/20/2015	0	0.8	0	1.7	0	1.2	0	13.8	0	13.6
1/22/2015	0	0.7	0	2.5	0	0.5	0	9.7	0	11.8
1/26/2015	0	0.9	0	1.1	0	0.3	0	12.6	0	6
1/30/2015	0	0.4	0	1.3	0	0.6	0	14.4	0	3.2
2/3/2015	0	0.7	0	1.2	0	0.7	0	14.4	0	3.5
2/9/2015	0	1	0	2.5	0	1	0	25.1	0	15.9
2/11/2015	0	0.7	0	1.5	0	1	0	15.2	0	11
2/18/2015	0	0.8	0	1.2	0	0.8	0	17.7	0	5.7
2/26/2015	0	0.5	0	1.5	0	0.5	0	37.7	0	10.5
3/2/2015	0	0.5	0	1.2	0	0.7	0	50.2	0	15.6
3/6/2015	0	0.2	0	1.4	0	0.2	0	8.1	0	3.8
3/9/2015	0	0.5	0	1.2	0	0.7	0	39.5	0	32.7
3/12/2015	0	1.5	0	1.2	0	2	3	43	0	39.3
3/16/2015	0	1.1	0	1.5	0	0.8	4	52.3	8	58.3
3/20/2015	0	0.8	0	3.5	0	1.1	0	16.7	0	16.7
3/24/2015	0	0.4	0	1.2	0	1	0	16.7	0	12.4
3/31/2015	0	0	0	1.2	0	0.8	not monitored		15	17.6
4/2/2015	0	0.1	0	0.4	0	0.1	5	42.2	3	22.9
4/7/2015	0	0	0	0.4	0	0	6	53.1	4	15.8
4/10/2015	0	0.7	0	0.7	0	0.8	1	12	0	3.2
4/13/2015	0	0.4	0	0.6	0	0.3	3	12.8	17	34
4/15/2015	0	0.2	0	0.8	0	0.2	0	17.2	0	5.8
4/16/2015	0	0	0	0	0	0	3	27.1	5	36.2
4/20/2015	0	0	0	0	0	0	0	9.6	0	14
4/21/2015	0	1.1	0	1.1	not monitored		3	39.5	0	6.6
4/23/2015	0	1	0	1.5	0	1	0	40.7	0	10.5
4/27/2015	0	<0.5	0	0.6	0	<0.5	0	13.3	0	2.6
4/29/2015	0	0	0	0.4	0	0	0	32.32	0	14.5
5/1/2015	0	0	0	0.1	0	0	0	4.7	0	12
5/4/2015	0	<0.2	0	0.5	0	<0.2	0	25.7	0	36.3
5/7/2015	0	<0.2	0	0.5	0	<0.2	0	18.5	0	13.2
5/14/2015	0	0	0	0.2	0	0	0	15.8	0	11.7
5/18/2015	0	<0.5	0	0.5	0	<0.5	0	27	0	24.8

Greetings,

You are receiving a document from the Agency for Toxic Substances and Disease Registry (ATSDR). We are very interested in your opinions about the document you received. We ask that you please take a moment now to complete the following ten question survey. You can access the survey by clicking on the link below.

Completing the survey should take less than 5 minutes of your time. If possible, please provide your responses within the next two weeks. All information that you provide will remain confidential.

The responses to the survey will help ATSDR determine if we are providing useful and meaningful information to you. ATSDR greatly appreciates your assistance as it is vital to our ability to provide optimal public health information.

<https://www.surveymonkey.com/r/ATSDRDocumentSatisfaction>

LCDR Donna K. Chaney, MBAHCM
U.S. Public Health Service
4770 Buford Highway N.E. MS-F59
Atlanta, GA 30341-3717
(W) 770.488.0713
(F) 770.488.1542



