Letter Health Consultation

WEDRON GROUNDWATER CONTAMINATION SITE

WEDRON, ILLINOIS

EPA FACILITY ID: ILN00051067

JUNE 12, 2014

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

WEDRON GROUNDWATER CONTAMINATION SITE

WEDRON, ILLINOIS

EPA FACILITY ID: ILN00051067

Prepared By:

Agency for Toxic Substances and Disease Registry (ATSDR)
Division of Community Health Investigations
Central Branch

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

June 6, 2014

Steven Faryan
Emergency Response Branch
Superfund Division
U.S. EPA Region 5
77 West Jackson Boulevard (SE-5J)
Chicago, IL 60604

Dear Mr. Faryan:

In October 2013, the U.S. EPA Region 5 asked the ATSDR to review sub-slab and indoor air sampling results from three residences in Wedron, IL, to evaluate the potential for exposure to benzene and other gasoline-related compounds through vapor intrusion. Benzene and other gasoline constituents were first identified in Wedron residential wells in 1982, in response to resident complaints of gasoline-type odors in water from their private wells. No source of contamination was identified at the time, and two new deep wells were installed as a remedy for seven affected residences. Investigations conducted by the Illinois EPA (IEPA) and U.S. EPA Region 5 Superfund Emergency Response program in 2011-2012, in response to additional resident complaints of gasoline odors in household water, found high levels of benzene, toluene, ethylbenzene, xylenes (BTEX), and other volatile organic compounds (VOCs) in residential wells and in soil. Levels of VOCs exceeding one or more health-based comparison values (CVs) were detected in eight of 46 wells sampled, affecting nine households. The levels of benzene and other compounds detected in soil samples at multiple locations also exceeded health-based criteria. These locations are suspected to be the source area of the groundwater plume, and are still under investigation by EPA Region 5 Superfund Emergency Response program and the IEPA.

In October 2013, U.S. EPA Region 5 completed the installation of new wells for the nine affected households to provide a permanent source of clean water for drinking and household use. The new wells were connected to a deeper aquifer, which has been evaluated and is free from BTEX/VOC contamination. U.S. EPA projects that many of the residences whose wells are not currently contaminated may be impacted in the future, based on proximity to the plume of groundwater contamination. The installation of new wells serving the nine homes has eliminated exposure of the residents through drinking water. However, given the high levels of BTEX compounds detected in soil adjacent to possible source areas and in shallow groundwater, ATSDR recommended evaluating the potential for vapor intrusion into the interior of residences overlying the plume. In response to these concerns, U.S. EPA Region 5 evaluated sub-slab and indoor air samples from three homes adjacent to the area where the highest soil concentrations of BTEX compounds were detected.

Environmental Data

In June 2013, U.S. EPA Region 5 and IEPA collected soil gas and soil samples from areas suspected to be possible sources of contamination, and on public right-of-ways adjacent to residences. One or more BTEX compound concentrations exceeded the Illinois EPA Tier 1 Soil Remediation Objectives (SRO) (Class 1 Migration to Groundwater) for Residential Properties, Tiered Approach to Correction Action Objectives (TACO) at several locations. The TACO criteria are chronic health-based screening levels. The highest concentrations of BTEX compounds in soil and soil gas were detected at locations where underground storage tanks have either been removed or may still be situated, and in industrial areas away from residences.

To address concerns about potential vapor intrusion of benzene and other compounds, U.S. EPA Region 5 collected sub-slab and indoor air samples from three residences adjacent to the areas where soil and soil gas VOC concentrations exceeded Illinois screening levels. Indoor air concentrations of benzene and other VOCs of interest were mostly below chronic health-based comparison values (Table 1). However, the indoor air concentration of benzene in residence three exceeded the ATSDR's Cancer Risk Evaluation Guideline of 0.13 $\mu g/m^3$, and in residence two exceeded the U.S. EPA's Regional Screening Level for ethylbenzene of 0.97 $\mu g/m^3$, both based on 10^{-6} cancer risk. While these exceedances are not expected to be associated with health effects, it is important to conduct additional vapor intrusion sampling to verify seasonal variability of VOC migration into indoor air. U.S. EPA Region 5 policy for vapor intrusion evaluation is to apply a 10^{-5} cancer risk level for making remedial decisions (U.S. EPA Region 5, Superfund Division, Vapor Intrusion Guidebook, October 2010). None of the measured sub-slab or indoor air concentrations exceeded ATSDR's acute environmental media evaluation guidelines (e.g. benzene=29 $\mu g/m^3$; ethylbenzene=22,000 $\mu g/m^3$; toluene=3,800 $\mu g/m^3$; xylenes=8,700 $\mu g/m^3$; trimethylbenzenes = not available).

Table 1: Comparison values and sampling results ($\mu g/m^3$) for chemicals of concern evaluated in sub-slab and indoor air samples, Wedron, Illinois, 2013. Data Source: U.S. EPA Region 5.

	Comparison Value		Residence 1		Residence 2		Residence 3	
Chemical	Subslab[1]	Indoor Air	Subslab	Indoor Air	Subslab	Indoor Air	Subslab	Indoor Air
Benzene	13	0.13[2]	2.4	ND	4.5	ND	4.2	**2.3**
Ethylbenzene	97	0.97[3]	5.2	ND	9.1	**1.8**	3.1	ND
Toluene	3,000	300[4]	9.9	1.6	15	6.7	10	4.6
Total Xylenes	1,000	100[5]	12	ND	24	7.7	9.2	ND
1,2,4-Trimethylbenzene	73	7.3[6]	ND[8]	ND	4.8	ND	2.3	ND
1,3,5-Trimethylbenzene	NA	NA[7]	ND	ND	1.6	ND	ND	ND

[1] A ten-fold factor is applied to the indoor air comparison value to obtain the sub-slab comparison value.
[2] ATSDR: Cancer Risk Evaluation Guideline, based on 10^{-6} cancer risk
[3] USEPA: Regional Screening Level, based on 10^{-6} cancer risk.
[4] ATSDR: Chronic Environmental Media Evaluation Guideline (non-cancer).
[5] USEPA: Reference Concentration (non-cancer).
[6] USEPA: Regional Screening Level (non-cancer).
[7] NA= Not available. No residential air comparison value is available.
[8] ND= Non-detect (below the laboratory detection limit).

Conclusions

1) The action of the U.S. EPA Region 5 Superfund Emergency Response Program to initially supply bottled water and eventually install replacement wells has eliminated the current public health threat for drinking water for the affected residences.

2) The results of the vapor intrusion sampling do not suggest immediate health threats from exposure to residents near the suspected source areas. Although both the sub-slab and indoor air concentrations fall below ATSDR acute environmental media evaluation guidelines, some are within the range of concern for chronic exposure and additional monitoring is warranted. Additional data are needed to verify levels of potential exposure.

3) Uncertainty about the boundaries of the contaminated groundwater plume supports the need for future plume characterization and residential well monitoring in Wedron, and for monitoring the potential for vapor intrusion at other locations.

Recommendations

ATSDR recommends:

1) Additional sampling at all three residences in order to further characterize indoor air concentrations of benzene and other VOCs. ATSDR is willing to review future sampling plans and data.

2) Monitoring residential wells in Wedron to a) verify that the deeper aquifer is not impacted by contamination, and b) identify shallow residential wells that could be affected by contamination in the future.

3) Performing soil gas and vapor intrusion sampling in areas where contaminated soil and groundwater is detected in the future.

Please do not hesitate to contact me at (312) 353-4766 if you have any questions regarding this letter, or if you require additional assistance.

Sincerely,

_____

Claudine M. Samanic, MSPH, PhD
Environmental Health Scientist
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Central Branch, Region 5

CC:
Samuel Borries, Branch Chief, USEPA-R5 Emergency Response/Branch 2

Mike Ribordy, Section Chief, USEPA-R5 Emergency Response/Branch 2/Section 3
Jacqueline Clark, USEPA Office of Regional Council
Tom Kenney, USEPA Office of Regional Council
Mark Johnson, ATSDR/ DCHI/CB
Rick Gillig, ATSDR/ DCHI/CB
Tina Forrester, ATSDR/ DCHI/OD
Kathy Marshall, Illinois Dept. of Public Health