

Letter Health Consultation

FORMER WURTSMITH AIR FORCE BASE

OSCODA, MICHIGAN

EPA FACILITY ID: MI5570024278

Prepared by
Michigan Department of Health and Human Services

OCTOBER 18, 2023

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Office of Capacity Development and Applied
Prevention Science
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.

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LETTER HEALTH CONSULTATION

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STATE OF MICHIGAN

DEPARTMENT OF HEALTH AND HUMAN SERVICES

LANSING

GRETCHEN WHITMER
GOVERNOR

ELIZABETH HERTEL
DIRECTOR

October 2023

Mr. Steve Willis
Department of the Air Force
Program Manager/BRAC Environmental Coordinator
Air Force Civil Engineer Center (AFCEC/CIBC)

Dear Mr. Willis:

Through a cooperative agreement (CDC-RFA-TS-23-001), the Michigan Department of Health and Human Services (MDHHS) is working with the federal Agency for Toxic Substances and Disease Registry (ATSDR) to address public health issues at the Former Wurtsmith Air Force Base (WAFB) site in Oscoda, Michigan. Based on review of the soil gas results, MDHHS is concerned that soil gas contamination may enter the indoor air of certain site buildings through vapor intrusion and pose a health hazard to building occupants. Therefore, MDHHS is issuing this letter health consultation to recommend indoor air samples to be collected from certain buildings as soon as possible to ensure the health of the occupants is safeguarded.

MDHHS's Division of Environmental Health - Toxicology and Assessment Section evaluated four rounds of soil gas sampling data collected from the former base between May 2020 and February 2021. The data were collected by the United States Air Force (USAF) as part of its vapor intrusion investigation due to the historical presence of volatile organic compounds (VOCs) at Former WAFB. The soil gas samples showed high levels of contaminants, one more than 140 times higher than its health-protective screening level, near several commercial buildings that are currently occupied.

Based on our evaluation, MDHHS concludes soil gas results indicate a potential for indoor air to be contaminated by certain VOCs and requires indoor air samples to determine whether this exposure pathway for VOCs is complete, leading to an increased risk of harm to people's health in buildings 25, 43, 5067, and 5068. This conclusion is based on the following:

- In soil gas within 100 feet of buildings 25, 43, 5067, and 5068, VOCs levels were above ATSDR's soil vapor intrusion (SVI) sub-slab and near-source (exterior) soil gas comparison values (CVs) and Michigan's non-residential Media Specific Screening Levels (MSSLs) and time-sensitive MSSLs (TSMSSLs). This

exceedance of soil gas screening levels may indicate that sub-slab and indoor air concentrations could exceed health-protective screening levels in these buildings.

- The data needed to make a health determination are not available. MDHHS recommends that the USAF complete concurrent, seasonal indoor air and sub-slab soil gas sampling at these properties to determine whether vapor intrusion could increase the risk of harm to people's health, including both workers and visitors. Seasonal (collected during both hot and cold weather) indoor air samples are required to make health determinations.

The remainder of this letter provides information supporting the above conclusion and recommendations.

Background

The Former WAFB is in Oscoda, Iosco County, Michigan, approximately 170 miles north of Detroit. The 5,221-acre site is located less than one mile from Lake Huron. It is bound by Van Etten Lake to the north and east, the Oscoda and Au Sable communities to the east and south, the Huron National Forest to the south, and the Alpena State Forest to the west. A variety of hazardous substances (e.g., fuels, solvents, and pesticides) have been handled, stored, and disposed of at the Former WAFB. Some of these materials were released to the environment, resulting in soil, groundwater, sediment, and surface water contamination at a number of locations. Contaminants from some of these areas have migrated beyond the base's boundaries.

Contaminants were first discovered at the Former WAFB in October 1977 when an on-base resident complained that the base's drinking water supply had peculiar tastes and odors. In response to this complaint, a tap water sample was collected from an on-base housing unit, and trichloroethylene (TCE) was detected. This discovery prompted several environmental investigations, and it soon became evident that a groundwater plume had formed under the base and was impacting on-base water supply wells. In the years to follow, the Former WAFB discovered that other environmental media (i.e., surface water, sediment, and soil) were impacted by VOCs as well as semi-volatile organic compounds (SVOCs). A total of 58 areas with potential contamination were evaluated at the Former WAFB under the Installation Restoration Program (IRP). At some of these areas, contamination was significant enough to warrant immediate cleanup activities. The site was proposed for the U.S. Environmental Protection Agency's National Priorities List in January 1994.

Several of the Former WAFB's main water supply wells were taken offline when contaminants were detected in the tap water at on-base housing areas in 1977. Today, the majority of on-base and off-base facilities, residences, and camps receive their drinking water from the Huron Shores Regional Utility Authority, which utilizes a surface water source and meets all federal and state drinking water quality standards. A few of Former WAFB's water supply wells are still in service and are being monitored by local authorities.

In addition to concerns about drinking water contamination, there are also concerns that people could be exposed to VOCs through vapor intrusion. In 2020, the USAF started quarterly sampling and performed sub-slab and soil gas sampling to determine whether VOC contamination could increase the risk of harm to people's health. This work included soil gas sampling at the following areas of VOC contamination at Former WAFB:

- (1) TCE and fuel spill near SAC Nose Doc and Operation Apron (Area SS008)
- (2) TCE spill northeast of building 43 (Area SS021)

The USAF performed soil gas sampling at Areas SS008 and SS021 in May, August, and November 2020, and in February 2021. Soil gas samples were collected from a depth of 5 feet below ground surface. See Figures 1 and 2 for sample locations and results.

Discussion

MDHHS compared the May 2020 through February 2021 soil gas data to both ATSDR SVI CVs and Michigan Department of Environment, Great Lakes, and Energy (EGLE)/MDHHS nonresidential MSSSLs and TSMSSSLs¹. MDHHS uses MSSSLs to identify soil gas concentrations that could potentially pose a vapor intrusion risk in nearby buildings. TSMSSSLs represent a greater level of risk and are used to identify conditions that may require more prompt investigation into nearby buildings. ATSDR SVI CVs, which assume 24-hour continuous exposure over a lifetime, are a conservative screening tool; however, they are not directly applicable to this site because they do not account for the reduced time that employees or visitors may spend in a nonresidential setting. The recommended actions are based on the EGLE/MDHHS nonresidential MSSSLs and TSMSSSLs.

Several VOCs were detected above MSSSLs or TSMSSSLs near buildings 25, 43, 5067, and 5068, including TCE; tetrachloroethylene (PCE); chloroform; cis-1,2-dichloroethylene (cis-1,2-DCE); and 1,1-dichloroethane (1,1-DCA). The buildings of concern are currently being used, but details of occupancy, building use, and current use of chemicals were not made available to MDHHS in spite of multiple efforts that were taken to obtain this information. Several of these detected chemicals are carcinogens (see Table 1 for information regarding cancer classifications). In addition to being a carcinogen, TCE also has the potential to cause fetal heart defects if a building occupant is pregnant while exposed to high levels of TCE in indoor air (Makris *et al.*, 2016).

¹ MSSSLs are based on a target cancer risk of one in 100,000 or a hazard quotient of one. TSMSSSLs are based on a target cancer risk of one in 10,000 or a hazard quotient of three.

Table 1. U.S. EPA and National Toxicology Program (NTP) cancer classifications for site contaminants of concern

Chemical	EPA Classification	NTP Classification
TCE	Carcinogenic to humans	Known human carcinogen
PCE	Likely to be carcinogenic to humans	Reasonably anticipated to be a carcinogen
Chloroform	Likely to be carcinogenic to humans	Reasonably anticipated to be a carcinogen
cis-1,2-DCE	Inadequate information to assess carcinogenic potential	Reasonably anticipated to be a carcinogen
1,1-DCA	Possible human carcinogen (no human, limited animal studies)	NA

The results of the May 2020 through February 2021 soil gas sampling conducted by the USAF at Areas SS008 and SS021 are summarized in Table 2, Table 3, and below:

- At Area SS008, there were exceedances of the MSSLs/TSMSSLs at two of the three sample locations (SS008-SG08 and SS008-SG09) which are located directly adjacent to building 5067 and within 100 feet of building 5068 (see Figure 1). Elevated levels of TCE; cis-1,2-DCE; and 1,1-DCA were detected in all four rounds of sampling.
- At Area SS021, there were exceedances of the MSSLs/TSMSSLs at all six sample locations during at least one sampling event. TCE, PCE, and/or chloroform were detected above the MSSLs/TSMSSLs at these locations, which are all within 100 feet of buildings 25 and 43 (see Figure 2).
- These sample locations are also near building 7009; however, as determined by EGLE, this building is not enclosed by four permanent walls so is not considered to be potentially affected by vapor intrusion.

Conclusion

MDHHS Division of Environmental Health - Toxicology and Assessment Section has reviewed the available information and found that the data needed to make a health determination are not available. Without the necessary data, MDHHS cannot currently assess whether vapor intrusion could increase the risk of harm to people's health in buildings 25, 43, 5067, and 5068.

This conclusion is based on soil gas data that demonstrates that there is soil gas contamination in close proximity to these buildings. However, there are data gaps, such as a lack of indoor air samples, that must be filled in order to determine whether vapor intrusion poses a health hazard to building occupants. The fact that several of the soil gas samples collected near these buildings exceed the TSMSSLs underscores the importance of filling these data gaps in a timely manner.

On March 3 and April 28, 2021, EGLE requested that the USAF collect sub-slab samples from buildings where nearby soil gas sample results exceed nonresidential Site-Specific Volatilization to Indoor Air Criteria (SSVIAC), which are equal to the nonresidential MSSLs. This work has not yet been performed.

Recommendations

Based on available information, MDHHS recommends that the USAF:

- Complete concurrent, seasonal indoor air and sub-slab soil gas sampling in buildings 25, 43, 5067, and 5068 to determine whether vapor intrusion may pose a health hazard to building occupants. Seasonal indoor air samples (collected during both hot and cold weather) are required to make health determinations. It may be necessary to conduct multiple rounds of sampling throughout the year to adequately characterize indoor air quality under worst-case, closed-building operating conditions.
- Provide MDHHS with a workplan and timeline for conducting indoor air and sub-slab soil gas sampling to review.
- Provide MDHHS with indoor air and sub-slab soil gas sampling data as soon as it is available.
- Provide MDHHS with building occupancy information.
- Inform occupants of the potentially affected buildings about the soil gas results.

MDHHS recommends the owners of buildings 25, 43, 5067, and 5068 inform people entering these buildings that a vapor intrusion investigation is being conducted due to elevated VOCs in the ground near the buildings. MDHHS will work with the Michigan Occupational Safety and Health Administration to respond to questions from occupants about what this investigation means and how it could affect their health. This action should be taken as soon as possible.

MDHHS will continue to be available to review and assist with the development of sub-slab and indoor air sampling plans. MDHHS is also available to develop and distribute health education materials, as needed. This letter health consultation may be updated based on additional information. If you have any questions or concerns, please contact MDHHS - Toxicology and Assessment Section at 1-800-648-6942.

Sincerely,

Puneet Vij, Ph.D.
Toxicologist
Toxicology and Assessment Section
Division of Environmental Health
Michigan Department of Health and Human Services

cc: Dan Medina, USAF
Brian Lynch, USAF
Kalan Briggs, EGLE
John Bradley, EGLE
Beth Place, EGLE
Amy Handley, EGLE

Andrea Keatley, MDHHS
Marcus Wasilevich, MDHHS
Denise M. Bryan, DHD2

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<https://doi.org/10.1016/j.reprotox.2016.08.014>

Table 2. Soil gas data (in micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) collected on four different dates from Area SS008 (TCE and fuel spill near SAC Nose Doc and Operation Apron), compared to ATSDR SVI sub-slab and near-source (exterior) soil gas CVs, nonresidential MSSSLs and TSMSSSLs. Sample SS008-SG08 is 26 ft from the building 5067 and 54 ft from building 5068. Sample SS008-SG09 is within 5 ft from building 5067.

Site Area SS008 – Building 5067 and 5068

Date	Sample ID	TCE	cis-1,2- DCE	1,1-DCA
5/27/2020	SS008-SG08	6,970 ^{***}	10,800 ^{***}	3,240 ^{**}
	SS008-SG09	39.5 [*]	159	53.3
8/24/2020	SS008-SG08	15,300 ^{***}	13,900 ^{***}	3,640 ^{**}
	SS008-SG09	4,170 ^{***}	4,280 ^{***}	1,240
11/10/2020	SS008-SG08	18,600 ^{***}	26,700 ^{***}	6,570 ^{**}
	SS008-SG09	3,090 ^{***}	5,190 ^{***}	1,350
2/16/2021	SS008-SG08	9,110 ^{***}	16,800 ^{***}	6,930 ^{**}
	SS008-SG09	369 ^{**}	1,100 ^{**}	453
-	ATSDR CV	7	NA	NA
	MSSSL	130	820	2,500
	TSMSSSL	400	2,500	25,000

* exceeds ATSDR CVs if available

** exceeds ATSDR CVs, MSSSLs if available

*** exceeds ATSDR CVs, MSSSLs and TSMSSSLs if available

Table 3. Soil gas data (in micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) collected on four different dates from Area SS021 (TCE spill northeast of building 43), compared to ATSDR SVI sub-slab and near-source (exterior) soil gas CVs, nonresidential MSSLs and TSMSSLs. Samples SS021-SG01, SG-02, and SG-05 are within 5 ft from building 43, and sample SS021-SG04 is 21 ft from the same building. Sample SS021-SG03 is within 5 ft and SG04 is within 21 ft from building 25.

Site Area SS021 – Building 43 and 25

Date	Sample ID	TCE	PCE	Chloroform
5/13/2020	SS021-SG01	125 [*]	142 [*]	13.7 [*]
-	SS021-SG02	341 ^{**}	69.3	3.79 [*]
-	SS021-SG03	31.7 [*]	37.1	152 [*]
-	SS021-SG04	34.5 [*]	74.7	103 [*]
-	SS021-SG05	52.8 [*]	20.6	3.02 [*]
-	SS021-SG06	1,070 ^{***}	2,050 [*]	30.1 [*]
8/26/2020	SS021-SG01	349 ^{**}	612 [*]	24.7 [*]
-	SS021-SG02	809 ^{***}	343 [*]	2.34 [*]
-	SS021-SG03	193 ^{**}	270 [*]	447 ^{**}
-	SS021-SG04	168 ^{**}	519 [*]	294 ^{**}
-	SS021-SG05	185 ^{**}	157 [*]	9 [*]
-	SS021-SG06	1,440 ^{***}	3,380 ^{***}	75.4 [*]
11/9/2020	SS021-SG01	205 ^{**}	463 [*]	18.5 [*]
-	SS021-SG02	458 ^{***}	110	6.62 [*]
-	SS021-SG03	67.5 [*]	118	197 ^{**}
-	SS021-SG04	64.3 [*]	192 [*]	149 [*]
-	SS021-SG05	62.2 [*]	50.3	5.74 [*]
-	SS021-SG06	2,710 ^{***}	7,060 ^{***}	42.5 [*]
2/15/2021	SS021-SG01	98.6 [*]	166 [*]	15.3 [*]
-	SS021-SG02	309 ^{**}	49.5	5.6 [*]
-	SS021-SG03	16.4 [*]	18.7	100 [*]
-	SS021-SG04	19.7 [*]	39.6	84.7 [*]
-	SS021-SG05	39.4 [*]	19.2	ND
-	SS021-SG06	1,020 ^{***}	2,560 [*]	27.9 [*]
-	ATSDR CV	7	130	1.4
-	MSSL	130	2,700	170
-	TSMSSL	400	2,700	1,700

* exceeds ATSDR CVs if available

** exceeds ATSDR CVs, MSSLs if available

*** exceeds ATSDR CVs, MSSLs and TSMSSLs if available

Figure 1: Soil gas (in micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) data from Area SS008.

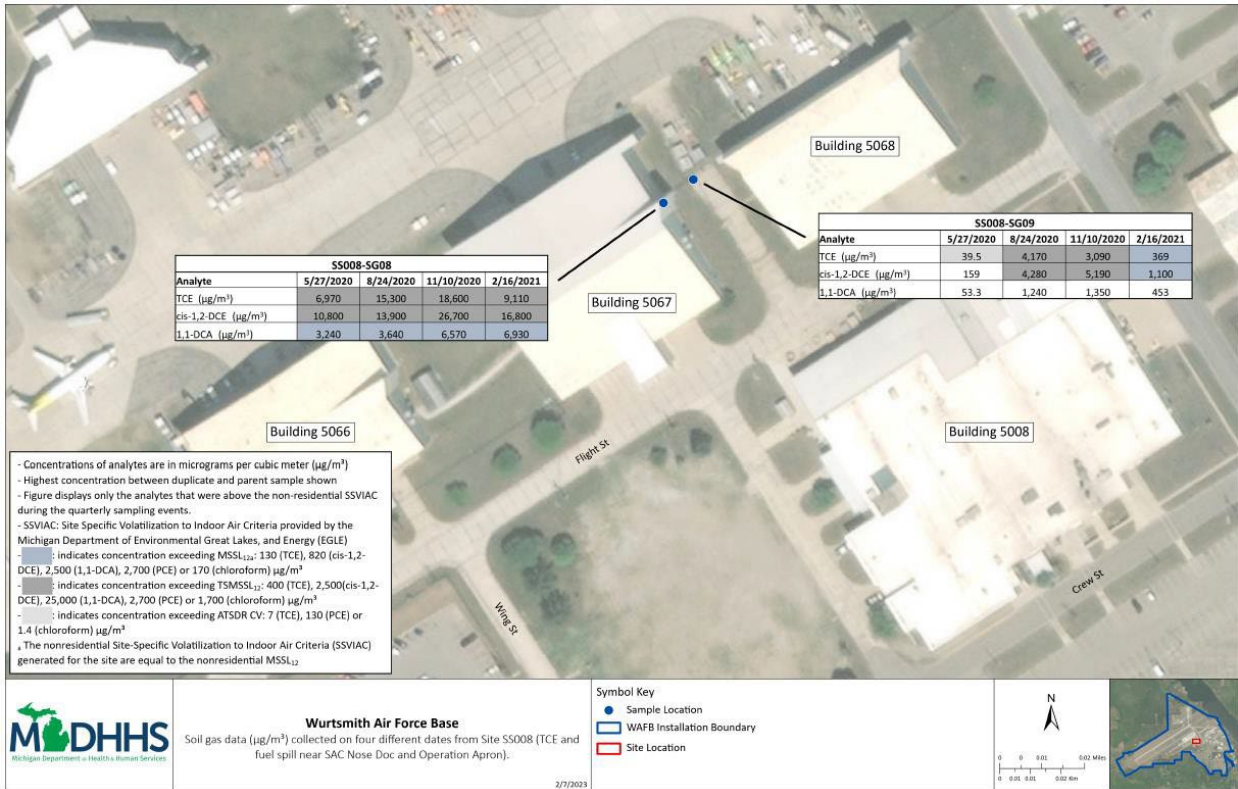
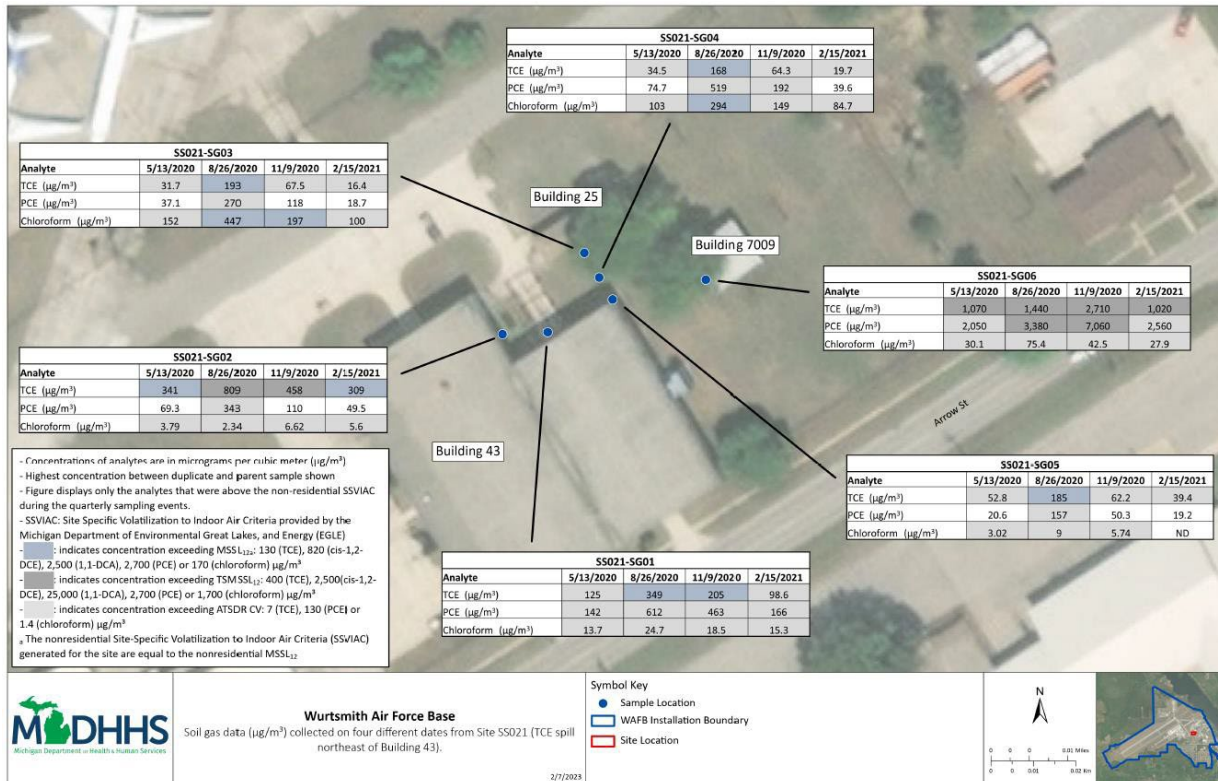


Figure 2: Soil gas data (in micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) from Area SS021.



Report Preparation

The Michigan Department of Health and Human Services (MDHHS) prepared this Letter Health Consultation for the Former Wurtsmith Air Force Base (WAFB) site, located in Oscoda, Iosco County, Michigan under a cooperative agreement CDC-RFA-TS-23-001 with the federal Agency for Toxic Substances and Disease Registry (ATSDR). The MDHHS evaluated data of known quality using approved methods, policies, and procedures existing at the date of publication. ATSDR reviewed this document and concurs with its findings based on the information presented by the MDHHS.

Author

Puneet Vij, PhD
Toxicologist
Environmental Assessment and ATSDR Unit
Toxicology and Response Section
Division of Environmental Health
Michigan Department of Health and Human Services

State Reviewers

Andrea Keatley, MPH CPH
Unit Manager
Environmental Assessment and ATSDR Unit
Toxicology and Response Section
Division of Environmental Health
Michigan Department of Health and Human Services

Jacob Carrick, MS
Toxicologist
Environmental Assessment and ATSDR Unit
Toxicology and Response Section
Division of Environmental Health
Michigan Department of Health and Human Services

Jennifer Gray, PhD, DABT
Senior Toxicologist
Division of Environmental Health
Michigan Department of Health and Human Services

ATSDR Cooperative Agreement Coordinator and Technical Project Officer

Audra Henry, MS
Program Services Section Chief
Office of Capacity Development and Applied Prevention Science (OCDAPS)
Agency for Toxic Substances and Disease Registry (ATSDR)
Centers for Disease Control and Prevention (CDC)

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Christopher Fletcher, MSEH, REHS/RS
Commander, USPHS
Technical Project Officer
Office of Capacity Development and Applied Prevention Science (OCDAPS)
Agency for Toxic Substances and Disease Registry (ATSDR)
Centers for Disease Control and Prevention (CDC)

ATSDR Regional Director

Motria Caudill, PhD
Environmental Health Scientist, Region 5
Office of Community Health and Hazard Assessment (OCHHA)
Agency for Toxic Substances and Disease Registry (ATSDR)
Centers for Disease Control and Prevention (CDC)