

Health Consultation

Evaluation of Private Domestic Well Sampling Data
Near Operable Unit 03

RIVERFRONT
(a/k/a NEW HAVEN PUBLIC WATER SUPPLY LINE)

NEW HAVEN, FRANKLIN COUNTY, MISSOURI

EPA FACILITY ID: MOD981720246

SEPTEMBER 30, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
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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HEALTH CONSULTATION

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Prepared by:

Missouri Department of Health and Senior Services
Division of Environmental Health and Communicable Disease Prevention
Section for Environmental Public Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Statement of Issues and Background

Statement of Issues

The US Environmental Protection Agency (EPA) Region VII requested that the Missouri Department of Health and Senior Services (DHSS), in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR), complete this health consultation to evaluate sampling results of four private domestic water wells located in the vicinity of Operable Unit 3 (OU3) of the Riverfront Superfund site in New Haven, Missouri. DHSS and ATSDR staff reviewed analytical results from those wells to determine if contaminants, such as volatile organic compounds (VOCs) and other possible chemicals may have migrated from OU3 to the private domestic wells and are present at a level of health concern.

Background

The Riverfront OU3 site is the New Haven old city dump, located in the southeastern part of New Haven, Franklin County, Missouri, along the north side of State Highway 100 (See Figure 1). The dump consists of a steep ravine where wastes were dumped, filling the upper end of the ravine. The surface of the dump covers about 1.5 acres. The surface has an approximate width of about 320 feet, extending to about 200 feet along the ravine. The surface of the dump is level and consists of gravel, dirt, and small amounts of weathered asphalt and concrete. The dump ranges from about 5 feet to 35 feet above the original land surface, with the open face of the dump sloping steeply to the ravine floor. The area surrounding the dump is wooded and undeveloped, except for an industry to the east and some residences located at a distance from the dump (1). See Figure 2 for a site map of OU3.

From the mid 1950s until 1974 the dump was used to dispose of household, industrial, and demolition waste, although no official records exist to document materials disposed of in the dump. However, local citizens and former employees of local industries have stated that hundreds of drums of industrial wastes, such as unused dyes, flammable solvents, waterproofing compounds, and waste fabrics from the manufacture of tents by a local industry, were disposed of at the dump. Community members stated that flammable materials were routinely burned in a pit at the site. Since the city purchased the dump in approximately 1972, the dump has been used to dispose of demolition debris from utility excavations and road maintenance, such as concrete, asphalt rubble, dirt, gravel, and yard wastes (1).

Water sampling by the Missouri Department of Natural Resources (MDNR) in 1986 had detected tetrachloroethylene (PCE) above the EPA's Maximum Contaminant Level (MCL) in one of the city's two public wells (No. 1 and 2). The MCL is the highest level of a contaminant the EPA allows in public drinking water. Uncontaminated water was provided to the New Haven public water system when the city drilled two new public wells (No. 3 in 1988 and No. 4 in 1994). The dump was considered as a possible source of the PCE contamination that had affected

the city of New Haven's old public wells (No. 1 and 2). PCE was suspected of having been used by some industries in the New Haven area for degreasing purposes and disposed of at the dump. To determine the source of the PCE contamination in the public wells, a Focused Remedial Investigation (RI) of Operable Units OU1 and OU3 was conducted. The sampling of private domestic wells located nearest to the dump was also completed to determine if these wells were being affected by the landfill (1).

PCE is a volatile organic compound (VOC) that evaporates easily in air, but remains in soil and groundwater without much decomposition. Since it is heavier than water it can easily travel through soil and into the groundwater. PCE is a synthetic chemical that is widely used for drying cleaning, metal degreasing, starting material for making other chemicals, and in some consumer products (2).

Shallow groundwater flow in the bedrock at OU3 is toward the northeast and east. The depth to groundwater in a monitoring well located at OU3 is about 92 to 98 feet below the land surface. However, perched water (water that has pooled above impervious layers in the ground) was found during drilling at the site at less than 50 feet. In addition, karst formations (e.g., caves, sinkholes, gaining and losing streams, and fractured rock structures) are found in this area. Therefore, it is very difficult to determine the source and flow pathways of any contaminants, which may be migrating off-site from the dump (1).

Because of the unique geology at the site, the four closest private domestic wells (closest approximately 500 feet) located on the east, south, and west sides of the dumpsite were tested to determine if contaminants had migrated off-site into the wells at unsafe levels. No private wells are located on the north side of the dump at this time (See Figure 2). The United States Geological Survey (USGS) had collected potable water samples as part of the RI from February 2000 through January 2001 and to be more specific to the OU3 site, conducted a follow-up sampling of the four closest private wells in April 2003. Samples were analyzed for VOCs, inorganic constituents (mineral-based compounds such as metal, nitrates, etc.), and physical properties (1, 3).

Discussion

USGS collected groundwater samples from a private well west of the dumpsite in February 2000 and from a well east of the dumpsite in January 2001. The samples were analyzed for PCE, trichloroethylene (TCE), specific conductance, and dissolved oxygen. No PCE or TCE was detected in the samples. Specific conductance and dissolved oxygen levels were consistent with other well water samples from the area (1).

In a follow-up sampling event on April 16, 2003, USGS and ATSDR staff collected water samples from four private wells located closest to the dumpsite on the east, south, and west sides. The samples were analyzed for VOCs, inorganic constituents, and physical properties. Methylene chloride (also called dichloromethane) was detected in two wells, one to the west and

one to the east of the dump. Methylene chloride was also detected in the field blank, but it may be a laboratory contaminant. Naphthalene was detected in a well located to the south of the dump (3). The maximum detected level of methylene chloride (dichloromethane) was compared to EPA's Maximum Contaminant Level (MCL) and was found to be below its MCL. The MCL is the highest level of a contaminant that EPA allows in public drinking water and are used in this health consultation only for comparison purposes. Because naphthalene does not have an MCL, the detected level was compared to EPA's Lifetime Health Advisory level and found to be below that standard (4). The Lifetime Health Advisory is the concentration of a chemical in drinking water that is not expected to cause any noncarcinogenic effects for a lifetime of exposure. No other VOCs were detected in the samples.

The following metals were detected in all four wells sampled: barium, iron, strontium, and zinc. Additionally, copper was detected in three of the wells, but it was undetectable in the well located to the east of the dumpsite. Metal levels were compared to EPA's MCLs, Lifetime Health Advisory, or Secondary Drinking Water Regulations. The Secondary Drinking Water Regulations establish standards for the taste and appearance of water (4). Water that exceeds secondary standards will not normally cause adverse health effects in people. All metals present in the samples were at levels lower than their appropriate standard. Therefore, the metals present in the drinking water do not pose a public health hazard at this time.

Child Health Considerations

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination in their environment. Children are at greater risk than adults from certain kinds of exposures to hazardous substances because they drink more water, eat more food, and breathe more air than adults per kilogram of body weight, and they have a larger skin surface in proportion to their body volume. They also play outdoors and are more likely to come in contact with soil than adults. In addition, children may get contaminated dirt on their hands, and they may ingest some of the dirt if they do not properly wash their hands before eating. They are also shorter than adults and thus are more exposed to dust, soil, and vapors because they are closer to the ground. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

DHSS and ATSDR evaluated the likelihood for children to be exposed to contaminants that may migrate into private wells located in the vicinity of the Riverfront OU3 Site. All VOCs and inorganic constituents were lower than applicable health screening values, and therefore children should be able to safely drink and use this water.

Conclusions:

No public health hazard exists for persons presently using potable water from the private wells tested. The levels of VOCs, and inorganics (including metals) in all the well water samples analyzed were lower than health screening values; therefore, the water is acceptable as a private water source. The category of No Public Health Hazard is used for sites for which data indicate that no current or past exposure or no potential for exposure exists and therefore that there is no health hazard.

Recommendations:

If the dump at OU3 is found to be affecting groundwater, EPA should implement a long-term private well monitoring program to ensure that contaminants do not migrate through groundwater to private wells located in the vicinity of OU3.

Public Health Action Plan

The Public Health Action Plan (PHAP) for the OU3 portion of the Riverfront site contains a description of actions to be taken by DHSS, ATSDR, and other stakeholders. The purpose of the PHAP is to ensure that this health consultation not only identifies public health hazards, but that it also provides an action plan to mitigate and prevent adverse human health hazards from present and/or future exposure to hazardous substances at or near the site. Below is a list of actions to be implemented by DHSS, ATSDR, EPA, and/or stakeholders at the site:

1. EPA will develop and implement a long-term sampling program to determine if contaminants are migrating from the dump at OU3 into the groundwater that could possibly affect private wells located in the vicinity of the dump with levels of contaminants that could pose a public health hazard.
2. DHSS and ATSDR will continue to evaluate additional well sampling data to determine if the wells are being affected by contaminants from OU3 at unsafe levels as it becomes available.
3. DHSS and ATSDR will continue to address community health concerns and questions as they arise and provide necessary community and health professional education.

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Attachments: Figure 1 – Riverfront Site Location Map
Figure 2 – Riverfront Site Map of OU3 and Vicinity

References

1. US Geological Survey and Black and Veatch Special Project Corp. Focused Remedial Investigation of Operable Units OU1 and OU3, Riverfront Superfund Site, Franklin County, Missouri. 2003 Jan.
2. Agency for Toxic Substances and Disease Registry. Toxicological profile for tetrachloroethylene – Update. Atlanta: US Department of Health and Human Services; 1999 Sep.
3. United States Geological Survey. Data sheets reporting VOC, metal, and inorganic components of well samples collected in the vicinity of Riverfront Superfund Site, OU3. New Haven, Missouri. 2003 May.
4. Environmental Protection Agency. 2002 Edition, Drinking Water Standards and Health Advisories. 2002.

CERTIFICATION

The Missouri Department of Health and Senior Services prepared this health consultation on the Evaluation of Private Domestic Wells Sampling Data near Operable Unit 3, Riverfront Site, under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated.

Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

Section Chief, SPS, SSAB, DHAC, ATSDR

Figure 1

Riverfront Site Location Map



