

Health Consultation

**Community Laundromat
Ava, Douglas County, Missouri**

CERCLIS No. MON000704080

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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

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Statement of Issues and Background

Statement of Issues

The U.S. Environmental Protection Agency (EPA), through the federal Agency for Toxic Substances and Disease Registry (ATSDR) Regional Office, has requested that the Missouri Department of Health and Senior Services (DHSS) complete a health consultation for the Community Laundromat site in Ava, Missouri. This health consultation will examine whether the contaminant concentrations present in the soil and water and the exposure potential at that site pose a threat to public health.

Background

The Community Laundromat site, at 306 NW 12th Avenue in Ava, Douglas County, Missouri, is surrounded by industrial, commercial, agricultural, and residential properties. Ava is a small town located approximately 55 miles southeast of Springfield, Missouri, with an estimated population of 2,938 residents. Three hazardous waste sites — the Community Laundromat Site, the Sentinel Wood Treating site, and the 12th Avenue Solvents site (Figure 1) — are north of 12th Avenue, also known as State Route 14 and Business Highway 5. South of 12th Avenue is an affected off-site wetland area. Immediately east of the Community Laundromat site is the Action Auction Realty, an operating business. A private residence is located less than 200 feet to the east.

The Community Laundromat site area is approximately 15,000 square feet. The only on-site building was formerly a coin-operated public laundry/dry cleaning facility. Dry cleaning operations using tetrachloroethylene (PCE, also known as perchloroethylene) occurred at the site from 1987 until 1995. Today the facility is no longer in operation in any capacity. Sampling has indicated that a contaminated groundwater plume containing PCE exists beneath the property and extends at least ½ mile to the southwest. In groundwater, PCE can degrade into trichloroethylene (TCE), which in turn degrades to vinyl chloride. When groundwater was sampled in the area surrounding the Community Laundromat site, PCE and its degradation products were found.

The owner of the Community Laundromat business does not own the property on which the facility is situated; the building was occupied under a lease agreement. The owner of the Community Laundromat business described two events in the late 1980's that could potentially explain the presence of PCE in the soil and groundwater surrounding the facility:

1. The dry cleaning machine door accidentally came open and several gallons of dry cleaning fluid spilled onto the floor; it is possible that the fluid drained from the concrete floor to the edge of the foundation, and down the outside of the east side of the building onto the ground; and
2. An incident involving the spilling of sludge from the dry cleaning operations. Reportedly, the sludge from the dry cleaning machines was cleaned out regularly and stored in a 5-gallon bucket. The bucket was typically placed outside the entrance to the building (west side of building) and was accidentally knocked over, spilling the contents onto the ground (1).

The Sentinel Wood Treating site and the 12th Avenue Solvents site — both located north of 12th Avenue and west of the Community Laundromat site — are also potential sources of

groundwater contamination in the area. The contamination at the Sentinel Wood Treating site and potential human exposure are discussed in a separate DHSS health consultation entitled “Sentinel Wood Treating Company Incorporated,” dated April 27, 2004. The contamination at the 12th Avenue site and any potential human exposure are currently under evaluation and will also be discussed in a separate health consultation by the DHSS.

South of 12th Avenue, across from the 12th Avenue Solvents site and the Community Laundromat, is a water treatment system operated by Emerson Electric, the responsible party for the 12th Avenue Solvents site. This system collects surface water from the wetland area, treats it, and discharges it into the creek. It monitors and records the levels of contaminants in the water coming into the treatment system (influent) and in the treated water (effluent) discharged into the unnamed tributary.

Reportedly, no private wells are in use within the city limits — all residences within a mile of the site are supplied by city water (2). Four municipal wells constitute the City of Ava’s municipal water supply system (wells 2, 4, 5, and 6) and all of them are within 4 miles of the site. The nearest — Municipal well #4 — is approximately 500 feet north of the site (5). Figure 2 shows the location of the City of Ava’s public water supply wells.

Site Investigations

A nearby spring is located on Douglas County Health Department property, approximately 0.2 miles south of 12th Avenue. It is referred to as the “old spring house” because the water flows from an old concrete spring house foundation. The spring flows from the foundation into a small wetland area and then into a stream that feeds into the unnamed tributary to Prairie Creek. In May 2001, MDNR collected a sample from the spring that contained PCE at 35.1 micrograms per liter (µg/L) and TCE at 2.5 µg/L (1).

The U.S. EPA reviewed soil and groundwater sampling results from a pre-CERCLIS (Comprehensive Environmental Response, Compensation and Liability Act Information System) field investigation that was conducted at the site in July 2001. The findings were discussed in a February 15, 2002, Preliminary Assessment Report. Five soil borings were made across the site, labeled SB-1, SB-2, SB-3, SB-4, and SB-5. A soil sample was collected at a depth of 0 to 2 feet at locations SB-1 through SB-4. A deeper sample was collected at or just above the first occurrence of water. At SB-5 a sample was collected from the 0 to 2 foot interval only. No water was encountered at this location (5). See Figure 3 for a map of the sampling locations.

All soil samples were analyzed for volatile organic compounds (VOCs), semi-VOCs, and metals. No metals or semi-VOCs were detected at levels of health concern. PCE was found at a concentration of 19 micrograms per kilogram (µg/kg) in the soil sample collected from SB-1 at a depth of 17 to 18 feet below ground surface (bgs) near the water table (5). PCE was also found in a concentration of 570 µg/kg in a soil sample collected from SB-4 at a depth of 13 to 14 feet bgs (5). Table 1 is a listing of select soil sampling results.

Groundwater samples were collected at SB-1 and SB-2. PCE was found at levels of 1,300 µg/L in the SB-1 sample collected at 17 to 18 feet bgs. This sample also contained 1,1,1-trichloroethane (TCA) at a concentration of 12 µg/L (5). At location SB-2, PCE was detected at a concentration of 6 µg/L at a depth of 17 to 21 feet bgs. Table 2 is a listing of select water sampling results.

In early 2002 the Missouri Department of Natural Resources (MDNR) conducted a removal assessment sampling investigation at the site. During this sampling event, a total of 28 subsurface soil samples were collected from the sites labeled SB-CI-01 through SB-CI-19. PCE was detected in 10 soil samples from six locations (1). Levels of PCE ranged from 13 µg/kg to 12,400 µg/kg (1). During this sampling event a sample was also collected from the “old spring house.” The concentrations found (37.3 µg/L of PCE and 2.6 µg/L of TCE) indicated that the levels have not changed significantly since May 2001 (1).

The primary concern relating to the PCE in the on-site soil is that the concentrations exceed benchmarks for migration or leaching to groundwater, both Cleanup Levels for Missouri (CALM) (100 µg/kg for PCE) and EPA Soil Screening Levels for Migration to Groundwater (3 µg/kg for PCE) (1). Exceeding the benchmarks suggests that sufficient contamination is present to move into the groundwater. The main concern of this contaminant movement is the proximity of the public drinking water supply wells. Table 1 is a listing of select soil sampling results.

Four micro monitoring wells were drilled on-site during the MDNR sampling event, numbered MW-CI-01, MW-CI-02, MW-CI-03, and MW-CI-04. Groundwater samples were taken from MW-CI-01, MW-CI-02, and MW-CI-03 and analyzed for VOCs. MW-CI-04 did not maintain enough water for a sample to be taken. PCE was detected in the water sample from all three wells at levels significantly above the Maximum Contaminant Level (MCL) of 5 µg/L. An MCL is the maximum concentration of a chemical U.S. EPA will allow in public drinking water. MW-CI-01 is located downgradient of the spill outside of the main entrance and contained the highest concentration of PCE (21,400 µg/L). TCE was also detected in MW-CI-01 and MW-CI-02. See Figure 4 for a map of the soil and groundwater sampling locations. Table 2 is a listing of select water sampling results.

Since February 2001, Ava’s public wells have been on quarterly monitoring due to the contamination from the 12th Avenue Solvents and Sentinel sites. As of April 2002, no VOCs had been detected in any of the wells (1).

As part of the Administrative Order on Consent (AOC) between EPA, MDNR, and Emerson Electric, groundwater in the wetland area across from the 12th Avenue Solvents site is monitored and treated by a water treatment system. Sampling results, included as part of the December 2003 monthly report from Emerson Electric, indicated that contaminant levels in the influent are still elevated (6). Because, however, of Emerson Electric’s water treatment, levels of most contaminants in the effluent that flows into unnamed tributary are below detectable levels. Also, in December 2003 vinyl chloride levels were elevated in the influent and effluent. The carbon vessel that treats for vinyl chloride needed replacement. This problem was resolved in January 2004. Aside from vinyl chloride, the contaminants that were elevated were not attributable to the Community Laundromat site. PCE and TCE were both below MCLs in the influent, effluent and sampling locations.

ATSDR has developed comparison values (CVS) that are media-specific concentrations used by health assessors to select environmental contaminants of concern. Contaminant concentrations less than the CV are unlikely to pose a health threat. Contaminant levels above the CV do not necessarily indicate that a health threat is present, but such levels do indicate that further evaluation of the chemical and pathways is needed. Environmental media evaluation guides (EMEGs) and reference dose media evaluation guides (RMEGs) are CVs that have been derived for a variety of chemicals in various media. The levels of PCE, TCE, and TCA found in the on-

site groundwater did not exceed the ATSDR CVS for these chemicals. Tables 1 and 2 are lists of sampling results for soil and water.

Discussion

Soil has been contaminated by PCE in two main on-site areas. The contaminated soil was found at a depth of at least 13–14 feet bgs. Currently, all the contaminated soil is below the ground surface, thus exposure to contaminated soil is not anticipated and is not considered a health concern. Groundwater on-site is contaminated with PCE at levels above MCLs, due to PCE leaching out of the soil into the groundwater. In addition, it appears that the contaminated groundwater is migrating off site. Yet at this time, sampling results indicate that is not affecting the City of Ava's public drinking water supply. The closest municipal well is located less than 500 feet north of the site; however, this well is upgradient of the site and monitoring results do not indicate any contamination. There is no known contact with the groundwater on-site.

The degradation products of PCE have been found in the wetland area and in the "old spring house." Nevertheless, due to the treatment process carried out by Emerson Electric, the levels in the effluent and at the sampling locations are significantly below MCLs.

Conclusions

Using the available data and the reports of past activities, it is evident that the soil at the Community Laundromat site has been contaminated with PCE. Due to the nature of PCE, over time it has leached from the soil into the groundwater. Sampling results indicate that PCE and its degradation products are in the on-site groundwater. Still, no exposure is occurring at this time to the contaminated soil or groundwater. PCE is not affecting the public water supply, and no private wells are in the area. At the present time, therefore, the Community Laundromat site is classified as No Public Health Hazard. The No Public Health Hazard category is used for sites that, because of the absence of exposure, do not pose a public health hazard. If site conditions change and well sampling indicates that the PCE is adversely affecting the surrounding wells and the City of Ava's public water supply or treatment of the surface water in the wetland area would cease, the DHSS may need to re-evaluate the hazard classification for future exposure. The current classification is based on the following:

1. Contaminated soil containing PCE and its degradation products is present in the subsurface on the Community Laundromat site.
2. Groundwater on-site is contaminated with PCE and its degradation products. At this time, however, it is not affecting the public water supply, and private wells are non-existent.
3. Surface water in the area is being treated, and exposure to any elevated levels of contaminants is not anticipated.

Recommendations

1. EPA/MDNR should continue to monitor public water wells to track the presence of contaminants and ensure levels do not exceed any MCLs.
2. Emerson Electric should continue to treat the water in the wetland area to insure that contaminate levels remain below health-based levels.

3. Because the Community Laundromat site has been determined to be a continuing source of contamination in soil and groundwater, EPA/MDNR/Responsible Parties should consider removal actions to mitigate or prevent future exposures.

Public Health Action Plan

This Public Health Action Plan (PHAP) for the Community Laundromat site contains an explanation of actions to be taken by the Missouri Department of Health and Senior Services (DHSS), the Agency for Toxic Substance and Disease Registry (ATSDR) and other stakeholders. The purpose of the PHAP is to ensure that this public health consultation not only identifies public health hazards but provides an action plan to mitigate and prevent adverse human health effects resulting from past, present, and future exposures to hazardous substances at or near the site. Below is a list of public health actions to be implemented by DHSS, ATSDR, or other site stakeholders:

1. DHSS/ATSDR will coordinate with MDNR/EPA, the City of Ava, and the responsible party to implement the recommendations in this health consultation to eliminate future exposure to the contaminants.
2. DHSS/ATSDR will review additional sampling data as they become available and provide guidance regarding possible health risk.
3. DHSS/ATSDR will continue to address community health concerns and questions as needed, and provide necessary community and health professional education.
4. DHSS/ATSDR will update this public health consultation as more information becomes available.

Authors, Technical Advisors

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Missouri Department of Health and Senior Services

Certification

This Evaluation of the Community Laundromat Health Consultation was prepared by the Missouri Department of Health and Senior Services 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 this 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.

Team Lead, CAT, SPAB, DHAC

References

1. Missouri Department of Natural Resources. Removal assessment report. Community Laundromat Site, Douglas County, Missouri. Jefferson City, MO: MON000704080; 2002 April 23.
2. Missouri Department of Health and Senior Services. Health consultation concerning 420 NW 12th Avenue, Sentinel Wood Treating Company Incorporated. Jefferson City, MO: 1998 May 19.
3. Missouri Department of Natural Resources. Expanded Site Inspection Report, Sentinel Wood Treating Co Inc Site, Douglas County, Missouri. Jefferson City, MO: 2002 September 9.
4. Missouri Department of Health and Senior Services. Health Consultation concerning evaluation of off-site contamination into the unnamed tributary of Prairie Creek. Jefferson City, MO: 2001 December 4.
5. Tetra Tech EM Inc., Preliminary assessment for Community Laundromat Site- Ava, Missouri. Lenexa, KS: 2002 February 15.
6. Environmental Strategies Consulting, LLC. 12th Avenue Solvents Site, Monthly Project Status Report, report No.25. Cazenovia, NY: 2003 December.
7. Tetra Tech EM Inc., Revised Pre-CERCLIS Site Screening Assessment. Community Laundromat, Ava, Missouri. Lenexa, KS: 2001 November 2.

Figure 1:Map of all Sites, Ava, Douglas County, Missouri



N

Not to Scale

Modified from: http://soils.missouri.edu/HTML_manuscripts/soilsmdb/intro.asp?series=MO005

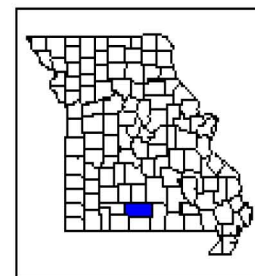
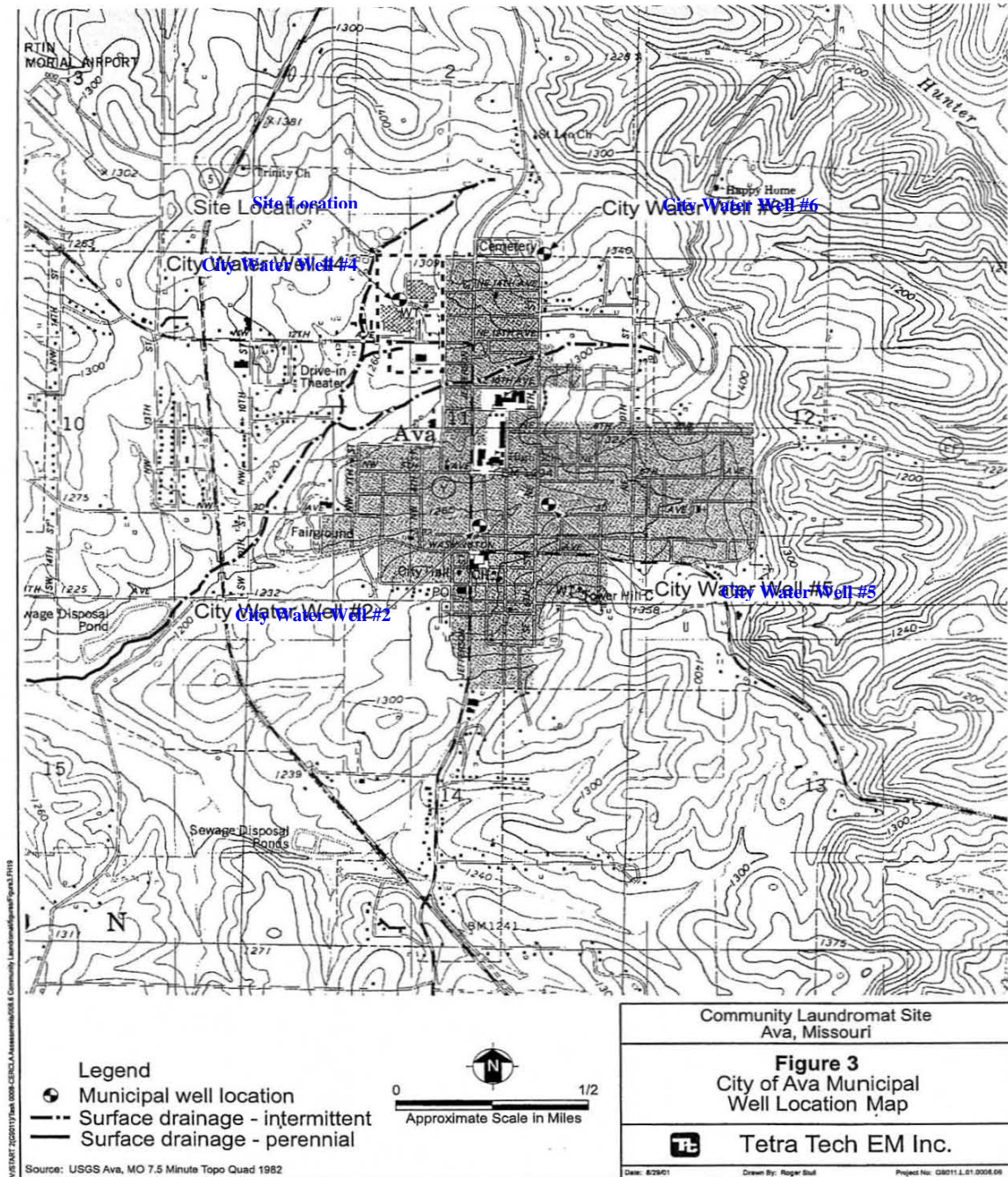
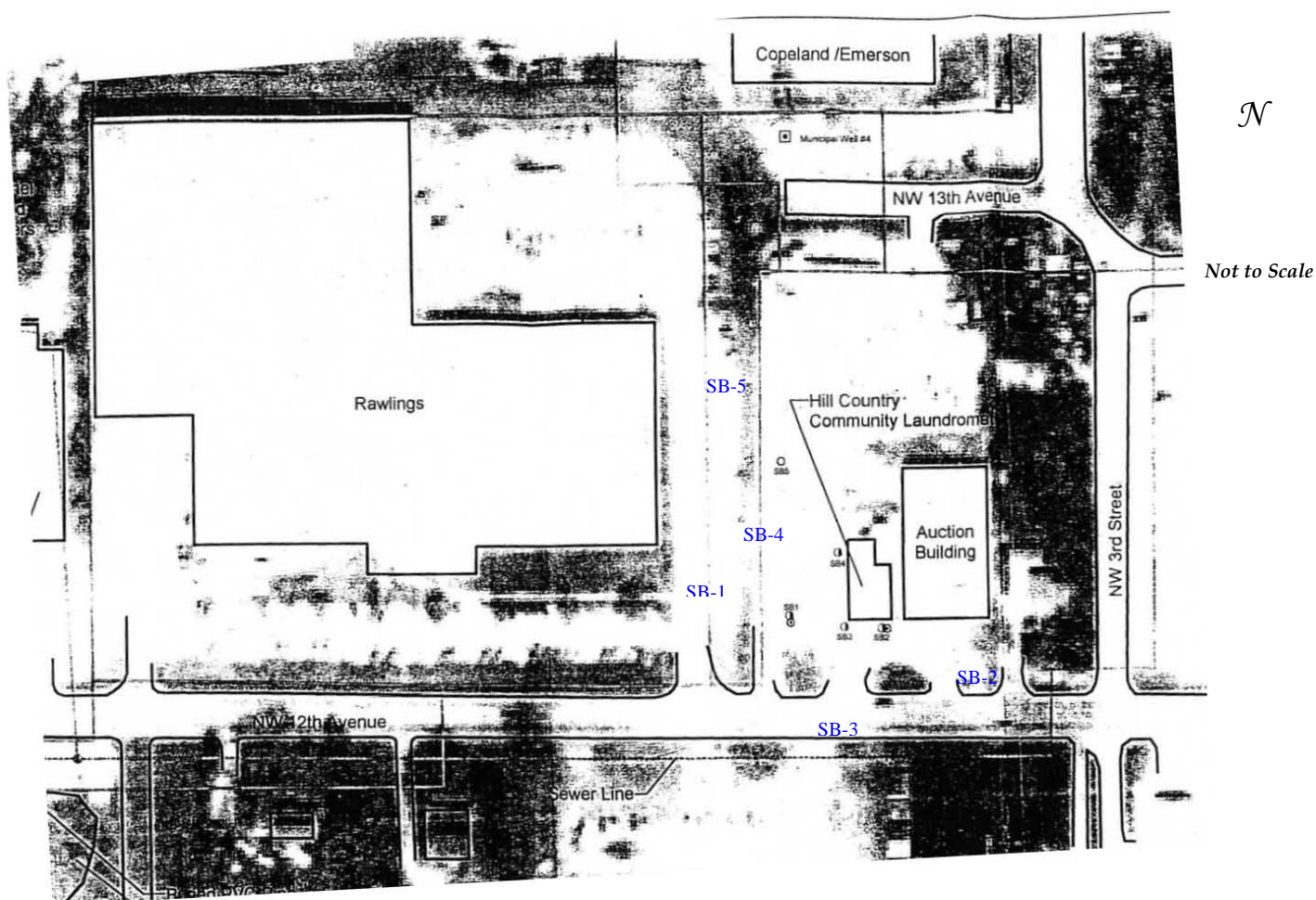


Figure 2: Map of City Water Wells, Ava, Douglas County, Missouri



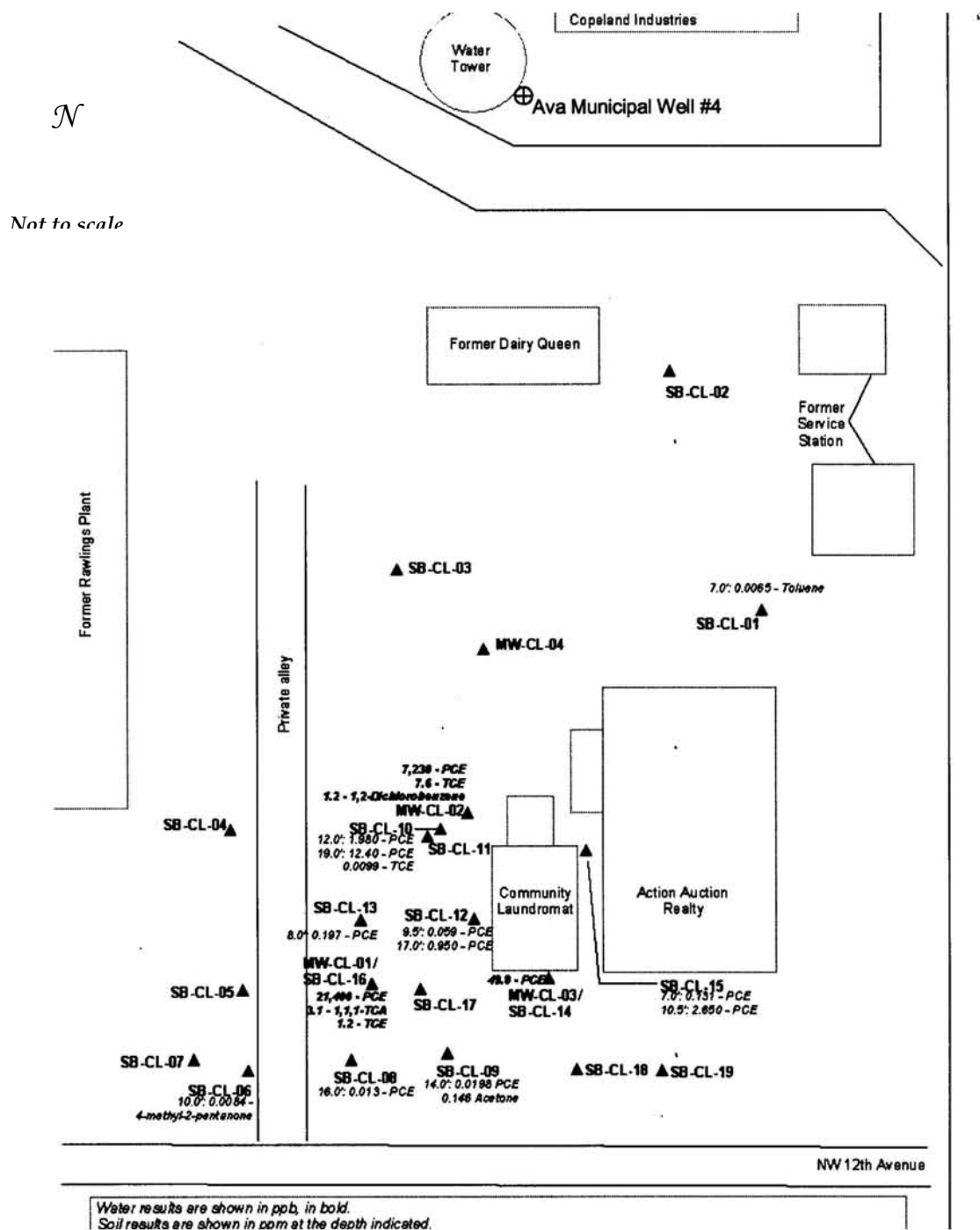
Modified from: Tetra Tech EM Inc., Preliminary Assessment. Community Laundromat Site- Ava, Missouri.

Figure 3: Map of Sampling Locations (Tetra Tech), Community Laundromat Site, Ava; Missouri



Modified from: Tetra Tech EM Inc., Revised Pre-CERCLIS Site Screening Assessment. Community Laundromat, Ava, Missouri.

Figure 4: Map of Sampling Locations (MDNR), Community Laundromat Site; Ava, Missouri



Source: Missouri Department of Natural Resources. Removal Assessment Report. Community Laundromat Site, Douglas County, Missouri. MON000704080.

Table 1: Select Soil Sampling Results, Community Laundromat Site; Ava, Missouri

Sample ID	Depth (feet)	Tetrachloroethylene (µg/kg)	Trichloroethylene (µg/kg)
EPA Soil Screening Levels for Migration to Groundwater DAF 20 DAF 1		60	60
		3	3
ATSDR EMEGs Chronic, Child Chronic, Adult Intermediate, Child Intermediate, Adult		NA	NA
		NA	NA
		NA	NA
		NA	NA
SB-1 (EPA)	0-2	11	11
	17-18	19	15
SB-2 (EPA)	0-2	11	11
	13-14	20	20
SB-3 (EPA)	0-2	14	14
	14-16	14	14
SB-4 (EPA)	0-2	11	11
	13-14	570	57
SB-5 (EPA)	0-2	11	11
20-FB (EPA)	Trip blank	11	11
SB CL-01 (DNR)	4.5	<5	<5
	7.0	<5	<5
SB CL-02 (DNR)	15.5	<5	<5
	18.0	<5	<5
SB CL-03 (DNR)	11.0	<5	<5
SB CL-04 (DNR)	1.5	<5	<5
SB CL-05 (DNR)	20	<5	<5
SB CL-06 (DNR)	10	<5	<5
SB CL-07 (DNR)	12.5	<5	<5
SB CL-08 (DNR)	8.0	<5	<5
	16.0	13	<5
SB CL-09 (DNR)	12.0*	<5	<5
	12.0	<5	<5
	14.0	19.8	<5

Sample ID	Depth (feet)	PCE (µg/kg)	TCE (µg/kg)
EPA Soil Screening Levels for Migration to Groundwater DAF 20 DAF 1		60	60
		3	3
ATSDR EMEGs Chronic, Child Chronic, Adult Intermediate, Child Intermediate, Adult		NA	NA
		NA	NA
		NA	NA
		NA	NA
SB CL-10 (DNR)	12.0	1980	<5
	19.0	<u>12,400</u>	0.0099
SB CL-12 (DNR)	9.5	59	<5
	17.0*	741	<5
	17.0	950	<5
SB CL-13 (DNR)	2.5	<25	<5
	8.0	197	<5
SB CL-14 (DNR)	9.0	<5	<5
SB CL-15 (DNR)	7.0	131	<5
	10.5	2650	<5
SB CL-18 (DNR)	9.5	<5	<5
	1.5	<25	<5
SB CL-19 (DNR)	6.0*	<5	<5
	6.0	<5	<5

All values in µg/kg (micrograms per kilogram).

*Duplicate sample.

DAF 20 values are calculated using a default-attenuation factor (DAF) of 20 to account for natural processes that reduce contaminant concentrations in the subsurface. Also included are generic soil screening levels (DAF 1) that assume no dilution or attenuation of between the source and the receptor well.

Values in boldface type exceed EPA Soil Screening Levels for Migration to Groundwater (DAF 20) values.

ATSDR=Agency for Toxic Substance and Disease Registry.

EMEG=Environmental Media Evaluation Guide.

Chronic=exposure that occurs continuously for more than one year.

Intermediate=exposure that occurs for more than 15 days but less than one year.

MCL=Maximum Contaminant Level.

RMEG=Reference Dose Media Evaluation Guide.

Table 2: Select Water Sampling Results, Community Laundromat Site; Ava, Missouri

Sample Location	PCE	TCE	TCA
EPA MCL	5	5	200
ATSDR RMEG			
Child	100	NA	NA
Adult	400	NA	NA
101	1300	0	12
102	6.0	0.5	0.5
105	0.5	0.5	0.5
106	0.5	0.5	0.5
MW-CL-01	21,400¹	1.2	3.1
MW-CL-02	7,230¹	7.6	<1
	7,080*¹	6.5	<1
MW-CL-03	49.8	<1	<1
MW-CL-04	1.7	<1	<1
	1.6	<1	<1

All values in µg/L (micrograms per liter).

*Duplicate samples.

¹=A 1:100 dilution was analyzed on 2/14/02 to quantitate PCE.

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