

# Health Consultation

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Cedar Chemical Corporation Remediation Review

CEDAR CHEMICAL CORPORATION  
49 PHILLIPS ROAD 311  
WEST HELENA, PHILLIPS COUNTY, ARKANSAS 72342

EPA FACILITY ID: ARD990660649

**Prepared by**  
**Arkansas Department of Health**

APRIL 5, 2010

Prepared under a Cooperative Agreement with the  
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners 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 or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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## SUMMARY

### INTRODUCTION

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In the area surrounding the Cedar Chemical Company site in West Helena, Arkansas, ATSDR's top priority is to ensure that the community has the best information possible to safeguard its health and prevent people from coming in contact with potentially harmful toxic substances.

### CONCLUSION

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**ADH/ATSDR conclude that accidental ingestion or skin contact of subsurface soil or groundwater at Cedar Chemical Company by a residential child or adult (and/or trespasser) is not expected to harm people's health because the exposure route has been eliminated due to no (or very limited) contact with the site.**

### BASIS FOR DECISION

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Because of the site's restricted access to the public, limited proximity to any residential area, and public drinking water access, a pathway exposure for any child or adult (*i.e.*, trespasser or nearby resident) is eliminated.

### NEXT STEPS

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This site is monitored by security surveillance, and neither the public nor trespassers should have access to any environmental media at this site. ADH will continue to review any new data provided by ADEQ and/or EPA, and update health recommendations as necessary. Also, ADH will conduct health education in the community, as needed and/or requested and mail letters and a copy of this finalized health consultation to community members or other stakeholders, as requested.

### FOR MORE INFORMATION

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If you have concerns about your health, you should contact your health care provider. You can also call ADH at 1-501-661-2893 and ask for information on the Cedar Chemical Company site.

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## Statement of Issues

Cedar Chemical Corporation (CCC) manufactured insecticides, herbicides, and polymers used in the agricultural industry from the early 1980's until the company closed in 2002. The site is currently being held under a public trust in bankruptcy court, and the Arkansas Department of Environmental Quality (ADEQ) assumes public control of CCC. The local community, state and federal agencies, land owners, and local politicians have all played active roles in ensuring adequate steps are taken to protect public health against any off-site contamination caused by the former facility production process.

The Arkansas Department of Health (ADH) has worked with the U.S. Environmental Protection Agency (EPA) and ADEQ pertaining to CCC environmental data evaluation, and ADH produced two previous health consultations concerning this site due to requests from state officials', as well as the community. The two previous health consultations regarding CCC, written in 2005 and 2006, can both be accessed online through the following website:

<http://www.atsdr.cdc.gov/hac/PHA/HCPHA.asp?State=AR>. The most recent data for this site have been identified in the CCC "Facility Investigation Report (FIR)" submitted to ADEQ in early 2009 [1] and the CCC "Feasibility Study (FS)," submitted to ADEQ in late 2009 [2]. These reports will help determine future remediation steps to take in order for final stages of clean-up at CCC to be completed. Under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), ADH has prepared this health consultation to determine if possible exposures to soil or groundwater contaminated with elevated chemical concentrations reported in the FIR or FS could result in harm to the surrounding community currently, during remediation activities or after remediation at CCC.

## Background and History

CCC, covering approximately 48 acres, is located in the West Helena Industrial Park. The abandoned manufacturing facility consists of approximately 40 fenced acres. An additional eight acres contain the active wastewater treatment ponds, thought to be constructed in 1977. The wastewater treatment ponds are permitted by ADEQ following state and federal regulations and discharge into the Mississippi River [1].

This site is surrounded by other industrial companies, a rail road line, agricultural property, and State Highway 242. Past plant operations at CCC resulted in off-site groundwater contamination south of the facility. The contaminant of concern (COC) from this contamination was identified as 1,2-dichloroethane (1,2-DCA). According to the current FIR, potential contamination sources at the CCC site include: six former process units in the manufacturing area, wastewater treatment facilities (both former and existing), and historical on-site waste disposal areas [1]. All may have contributed to past soil and groundwater contamination, both on- and off-site at CCC.

A recommendation to remove all aboveground portions of the facility structures (with the exception of the office buildings and large warehouse building) had been stated in the FS [2].

In the initial ATSDR health consultation (August 2005), ADH made the following recommendations: 1) the property owner and/or user of the irrigation well (identified as AGI-1) should not operate it until such time that the concentration of 1,2-DCA is below levels of health concern; 2) ADEQ and/or EPA should collect additional groundwater samples from the irrigation wells in the immediate area to better evaluate public health risk; 3) ADEQ and/or EPA should conduct air sampling/modeling to assess field workers' inhalation exposure risk [3].

In the follow-up ATSDR health consultation (June 2006), ADH concluded the evaluation of groundwater sampling data and site-specific air dispersion modeling demonstrated levels of 1,2-DCA to be below its respective health comparison values, and confirmed no harm should occur to exposed individuals [4]. The AGI-1 agricultural irrigation well was declared acceptable for return to normal operation, and the conditional use of the BHAGI-1 agricultural irrigation well imposed by ADH was removed (in a letter dated July 2005).

Since the facility's closure in 2002, CCC representatives have been working with ADEQ under state and federal guidelines in order to clean up residual contamination both on- and off-site. The most recent data identified in the CCC FIR and FS will help agency officials determine future remediation steps to take for final stages of clean-up at CCC to be completed. These data will also help identify groups with the highest potential exposure to contaminants left on- and off-site at CCC, should this area be redeveloped.

## Discussion

Exposure to COCs is determined by examining human exposure pathways. An exposure pathway has five parts:

1. A source of contamination (e.g., hazardous compound(s) in the soil or groundwater),
2. An environmental medium such as soil or water that can hold or move the contamination,
3. A point at which people come in contact with a contaminated medium,
4. An exposure route, such as skin contact or accidental ingestion with the soil or groundwater, and
5. A population who could come in contact with the contaminants (e.g. trespassers or area residents).

An exposure pathway is eliminated if at least one of the five parts is missing and will not occur in the future. For a completed pathway, all five parts must exist and exposure to a contaminant must have occurred, is occurring, or will occur.

The CCC site is guarded by security personnel 24 hours a day, and trespassers are not typical for this location. Due to the limited proximity and 24-hour surveillance, it is highly unlikely a trespasser would gain access to the site. However, should a trespasser happen on site, it further would not be feasible for them to access subsurface soil (greater than 6 inches deep) or groundwater. Therefore, the skin contact and incidental ingestion exposure routes for the trespasser (child or adult) can be eliminated.

As part of the thorough review process, each COC concentration level exceeding ATSDR health screening concentrations were examined from all the soil and groundwater data and calculated for both a risk assessment Hazard Quotient (HQ) value and theoretical Lifetime Cancer Risk (LCR) value, where applicable [5, 6]. See the following subheadings for specific discussions.

### Soil

A *potential* pathway has been identified for any industrial outdoor worker involved with the future site remediation or general site upkeep, since a source of COCs still exist in the soil on-site (and the groundwater on- and off-site). Specifically, a potential exposure pathway does exist if an industrial outdoor worker (i.e., environmental worker or construction worker) comes in contact with contaminated soil (greater than 6 inches deep) (or with groundwater) while performing excavation, maintenance, or remedial work at the CCC site. However, if that worker does not come into contact with that soil (or groundwater), that human exposure pathway is not considered complete. This potential exposure scenario falls under the oversight of worker health and safety regulations or standards already in place by the Occupational Safety and Health Administration (OSHA). Any conditions for an outdoor industrial worker shall fall under the directive of OSHA. OSHA is responsible for ensuring that all regulators and workers be aware of the site's current conditions. Procedures are in place by OSHA, who works together with other federal and state authorities and private contractors, in order to monitor worker's health to confirm that safety regulations and precautions are routinely followed if and when exposure to a contaminant is possible.

As stated previously, 1,2-DCA has been reported as a historical contaminant. In subsurface soil, the highest reported concentration in the current FIR was 8.4 milligrams per kilogram (mg/kg) or parts per million (ppm) (sample DPT-39 at 12 to 16 feet), compared to the ATSDR health screening value for 1,2-DCA in soil, which is 8.0 ppm. This sample was located in the southwestern corner of the facility near the DCA Process Unit 6.

Another COC found in soil above ATSDR health screening values was dinoseb. The highest reported concentration of dinoseb was 4,900 ppm (sample DPT-35 at 12 to 16 feet). The ATSDR health screening value for dinoseb is 700 ppm for an adult. This sample was also located in the southwestern portion of the facility in between the former dinoseb disposal pond and the drum vault. All other COCs listed in the FIR for soil media were eliminated for public health purposes since the reported concentrations fell below the ATSDR health screening values.



The difference in the reported subsurface soil value and the screening value is small, and there were no potential risks shown in the calculations done for a person exposed to skin contact or accidental ingestion pathways for 1,2-DCA or dinoseb.

### **Groundwater**

As in previous reporting, the FIR and FS denote two distinct hydrogeological settings at the CCC site: the Perched Zone and the Alluvial Aquifer. The Perched Zone is in the uppermost water-bearing zone, approximately 30 to 40 feet below ground surface. The Alluvial Aquifer is further down in the earth's surface, approximately 45 to 150 feet below ground surface. From monitoring performed at this site, it appears that most of the contamination has come about first through the soil into the Perched Zone groundwater, which then traveled down into the Alluvial Aquifer groundwater before being transported off-site [1, 2].

Groundwater samples were taken from temporary wells on-site, as well as monitoring wells on- and off-site. The temporary wells (TW) were located around the process areas, drum vault, and the former dinoseb disposal ponds, and water was pulled from the Perched Zone in the spring of 2008. Samples from water pulled from the Alluvial Aquifer were taken from monitoring wells (MW) scattered around the CCC facility and in off-site boundaries in the summer and fall of 2008 [1].

Thirteen COCs, as shown in Table 1, were detected with concentration values higher than the ATSDR screening value, and further calculations were done to evaluate potential risks from each exposure pathway (dermal and accidental ingestion). The highest reported groundwater sample concentration of each COC was used in theoretical risk calculations. It is important to point out that 1,2-DCA and dinoseb have both on- and off-site values represented in the data. Data indicate that higher groundwater concentrations are detected on-site, while lower detectable groundwater levels are found off-site. This means there is less contaminated media off-site for anyone to be exposed, and no exposure pathway was identified. There were no groundwater data samples that showed a potential health risk to residents or trespassers after calculations were performed, so no harm would be expected because no exposure is likely.

**Table 1.** Contaminants of Concern Found in Groundwater Samples\*

Groundwater Sample ID	Groundwater Contaminant of Concern (COC)	Groundwater Concentration (ppb)	ATSDR Health Screening Value for water (ppb)
OFF-MW-4	bis(2-Chloroethyl)ether	15	0.03
TW-1	4-chloroaniline	13,000	100
TW-4	chloroform	13,000	400
TW-10	1,2-dichloroethane (1,2-DCA)	730,000	0.4
MW-18	1,2-dichloroethane (1,2-DCA)	120,000	0.4
OFF-MW-6LA	1,2-dichloroethane (1,2-DCA)	19,000	0.4
TW-6	2,4-dinitrophenol	12,000	70
TW-6	dinoseb	22,000	40
MW-18	dinoseb	1,400	40
TW-4	ethylbenzene	51,000	20,000
TW-1	isophorone	9,100	7,000
TW-10	methylene chloride	26,000	2,000
TW-1	propanil	18,000	200
TW-1	toluene	210,000	700
TW-6	1,1,2-trichloroethane	1.5	0.6
TW-4	xylene	72,000	7,000

\* Data as reported in the Cedar Chemical Facility Investigation Report, February 2009 [1]

### **Water Wells Within One Mile Of CCC**

According to the 2009 FIR, there are 12 water wells identified within a one-mile radius of the CCC site: 1 domestic well, 9 irrigation wells, and 2 “other” wells [1]. The domestic well and “other” wells are located to the north and northwest of the facility and the groundwater flow is primarily to the south and southeast. Since the wells located in the vicinity are all upgradient, it is not likely that any are in the path of any potential contaminant plume. During the FIR field work, a request for information on well status was mailed to the identified owner of each of the 12 private water wells, and as yet no responses were received by the contractors [1]. However, a private (residential) well survey conducted in 1996 identified numerous wells in the area surrounding CCC, and it was determined at that time that none of the wells were used as a drinking water source, as most of the wells were capped or not in working order. Documentation provided by the Arkansas Department of Pollution Control and Ecology (now known as ADEQ) indicates that the residential areas surrounding CCC are on public water, thus eliminating a residential groundwater exposure pathway by ingestion [7].

### **Drum Vault**

Although another potential on-site source of contamination was found in a drum vault located on the eastern side of the CCC facility, it is not considered likely that people could be exposed to any contaminants contained within the vault. Samples were taken from the drum vault, and then it was closed and resealed [1]. The drum vault is thought to contain past facility waste materials, including concentrations of several of the COCs already detected in the soil and groundwater [2]. However, this drum vault is currently closed and located inside the guarded facility, and it is unlikely that a trespasser or outdoor worker would intentionally gain access to the underground vault, which is the contact point; therefore, an exposure route is currently incomplete. The FS indicates that future remedy recommendations include the removal of the drum vault contents for off-site disposal [2]. At such time that the drum vault area becomes re-opened by the approved and properly trained personnel, OSHA regulations and federal and state remediation procedures will ensure that exposures to workers do not occur. The trespasser (or nearby resident) pathway would still be eliminated due to restricted access of this source area at the CCC site.

### **Community Health Concerns**

ADH/ATSDR attended a public meeting held by ADEQ on September 22, 2009. Several area residents and local politicians were in attendance and expressed an interest in the possible health effect of contaminated media at the CCC site and subsequent clean-up efforts. The general concern of the community centered on what adverse health effects could occur to the area residents, should the contaminated property not be properly cleaned-up. The citizens attending the meeting also expressed interest in obtaining an explanation of an assessment of the possibility of harmful exposure to contaminated environmental media still remaining. This health consultation document addresses those concerns and serves as that document.

### **Child Health Considerations**

In communities faced with soil contamination, the many physical differences between children and adults may require special emphasis. Children could be at greater risk than adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Additionally, children are dependent on adults for access to housing, for access to medical care, and for risk identification.

Therefore, adults need as much information as possible to make informed decisions regarding their children's health.

While separate evaluations are sometimes conducted to specifically address children's exposure pathway concerns, no child exposure pathway is present at the CCC site. Children (and adults) are not allowed on the secured site, the CCC is surrounded primarily by agricultural fields and other industrial facilities, and it is unlikely (and undocumented) that anyone within a one-mile radius has access to the groundwater for drinking water purposes. From a public health perspective, no additional child health precautions are presently needed at the CCC site.

## **Conclusions**

ADH/ATSDR conclude that accidental ingestion or skin contact of subsurface soil or groundwater at Cedar Chemical Company by a residential child or adult (and/or trespasser) is not expected to harm people's health because the exposure route has been eliminated due to no (or very limited) contact with the site.

## **Recommendations**

ADH/ATSDR recommends the following:

1. Under proper regulatory procedures, educate all industrial outdoor workers of the potential risks related to making skin contact or accidentally ingesting any of the groundwater on- or off-site at the CCC facility. Personal Protective Equipment (PPE) and adequate safety precautions should be used for anyone working near potential groundwater exposure areas.
2. Keep the drum vault area sealed and secured until remediation is implemented. At such time that the drum vault area becomes re-opened, drum vault content samples may be collected, and the data could be evaluated in order to identify any detectable levels of COCs and potential exposure pathways.

## **Public Health Action Plan**

The purpose of the Public Health Action Plan (PHAP) is to ensure that this health consultation not only identifies any public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. The PHAP implemented by ADH/ATSDR with regards to the Cedar Chemical Corporation site is as follows:

Completed Actions

- ADEQ and EPA collected additional groundwater data from agricultural wells in May 2005, as recommended by ADH.
- ADH prepared a groundwater data health consultation in August 2005.
- EPA Region 6 personnel performed site-specific air dispersion modeling in September 2005, as recommended by ADH, to assess risk of inhaling volatilized 1,2-DCA.
- ADH prepared a health needs assessment on May 8, 2006.
- ADH prepared a follow-up groundwater data health consultation in June 2006.
- ADH attended a CCC community meeting in West Helena on August 24, 2006.
- ADH conducted a site visit to CCC on February 16, 2007.
- ADH delivered 300 information packets (that included three fact sheets, one feedback form, and one postage-paid envelope per packet) to Cedar (Mt. Zion) Community Center on February 16, 2007.
- ADH developed a public service announcement regarding CCC for the Helena/West Helena community on February 20, 2007.
- ADH/ATSDR attended a public meeting on September 22, 2009.

Future Activities

- ADH will continue to review any new data provided by ADEQ and/or EPA, and update health recommendations as necessary.
- ADH will conduct health education in the community, as needed and/or requested.
- ADH will mail letters and a copy of this finalized health consultation to community members or other stakeholders, as requested.

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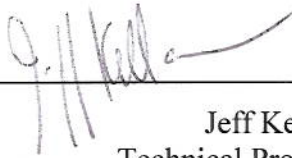
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### Certification

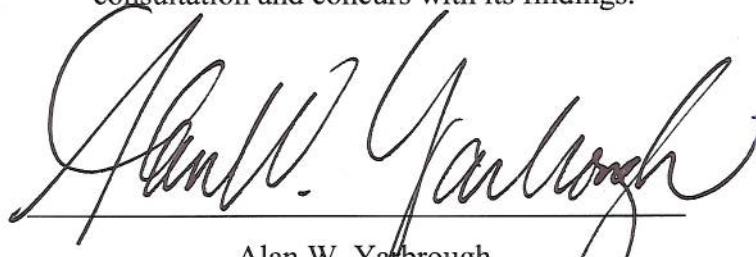
The Arkansas Department of Health prepared this health consultation for Cedar Chemical Corporation at 49 Phillips Road 311, West Helena, Phillips County, Arkansas, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodology and procedure existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.



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



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Alan W. Yarbrough  
Cooperative Agreement Team Leader, DHAC, ATSDR

## References

1. AMEC Geomatrix, Inc., “Facility Investigation Report, Cedar Chemical Corporation, Helena – West, Helena, Arkansas”; *Submitted to:* ExxonMobil Corporation and Helena Chemical Company; February 2009; Project No. 13636.
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3. Agency for Toxic Substances and Disease Registry (ATSDR) Health Consultation, “Health Implications of Farm Workers Exposed to Groundwater Adjacent to Cedar Chemical Corporation, 49 Phillips Road, 311 West Helena, Phillips County, Arkansas, 72342”; EPA FACILTIY ID: ARD990660649. U.S. Department of Health and Human Services, Public Health Service, ATSDR Division of Health Assessment and Consultation, Atlanta, Georgia 30333. August 1, 2005.
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