

# Final Work Plan: Groundwater Monitoring at Centralia, Kansas

---

prepared by  
Environmental Research Division  
Argonne National Laboratory



THE UNIVERSITY OF  
**CHICAGO**

Argonne National Laboratory is managed by  
The University of Chicago for the U. S. Department of Energy



United States Department of Agriculture

Work sponsored by Commodity Credit Corporation,  
United States Department of Agriculture

# **Final Work Plan: Groundwater Monitoring at Centralia, Kansas**

---

by  
Applied Geosciences and Environmental Management Section  
Environmental Research Division, Argonne National Laboratory

August 2005

## Contents

Notation.....	iii
1 Introduction .....	1-1
2 Background.....	2-1
3 Monitoring Plan.....	3-1
3.1 Monitoring Objectives.....	3-1
3.2 Scope of Work .....	3-1
3.3 Monitoring and Sampling Procedures.....	3-3
3.4 Sampling and Reporting Schedule.....	3-4
3.5 Quality Assurance and Quality Control .....	3-4
3.6 Health and Safety .....	3-6
4 References .....	4-1
Appendix A: Monitoring Well Construction Details and Historical Sampling Data.....	A-1

## Tables

2.1 Analytical results for carbon tetrachloride, chloroform and methylene chloride in groundwater samples collected from monitoring wells and piezometers at Centralia in 2002–2004 .....	2-2
2.2 Scoring of biodegradation processes at Centralia.....	2-3
3.1 Emergency information for field work at Centralia, Kansas.....	3-7
A.1 Sampling and construction details for permanent monitoring locations at Centralia, Kansas, 2002–2004 .....	A-2

## Figures

1.1 Location of Centralia, Kansas .....	1-2
2.1 Distribution of carbon tetrachloride in groundwater in the shallow aquifer at Centralia in August 2004.....	2-4
3.1 Locations of proposed monitoring points at Centralia, as of March 2005.....	3-8
3.2 Emergency route from Centralia to Sabetha Community Hospital.....	3-9

## Notation

AGEM	Applied Geosciences and Environmental Management
AMSL	above mean sea level
BGL	below ground level
°C	degree(s) Celsius
CCC	Commodity Credit Corporation
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	foot (feet)
h	hour
KDHE	Kansas Department of Health and Environment
µg/L	microgram(s) per liter
mg/L	milligram(s) per liter
mi	mile(s)
mV	millivolt(s)
QA	quality assurance
QC	quality control
USDA	U.S. Department of Agriculture
VOC	volatile organic compound
yr	year(s)

## **Final Work Plan: Groundwater Monitoring at Centralia, Kansas**

### **1 Introduction**

This *Work Plan* outlines the scope of work for a program of twice yearly groundwater monitoring at the site of a former grain storage facility at Centralia, Kansas (Figure 1.1). The purposes of this monitoring program are to follow changes in plume dynamics and to collect data necessary to evaluate the suitability of monitored natural attenuation as a remedial option, under the requirements of Kansas Department of Health and Environment (KDHE) Policy # BER-RS-042. This monitoring program is planned for a minimum of 2 yr.

The planned monitoring activity is part of an investigation at Centralia being performed on behalf of the Commodity Credit Corporation (CCC), an agency of the U.S. Department of Agriculture (USDA), by the Environmental Research Division of Argonne National Laboratory. Argonne is a nonprofit, multidisciplinary research center operated by the University of Chicago for the U.S. Department of Energy (DOE). The CCC/USDA has entered into an interagency agreement with DOE, under which Argonne provides technical assistance to the CCC/USDA with environmental site characterization and remediation at its former grain storage facilities.

Details and background for this *Work Plan* were presented previously (Argonne 2004, 2005). Argonne has also issued a *Master Work Plan* (Argonne 2002) that describes the general scope of and guidance for all investigations at former CCC/USDA facilities in Kansas. The *Master Work Plan* (approved by the KDHE) contains the materials common to investigations at all locations in Kansas. These documents must be consulted for the complete details of plans for this work associated with the former CCC/USDA facility at Centralia.

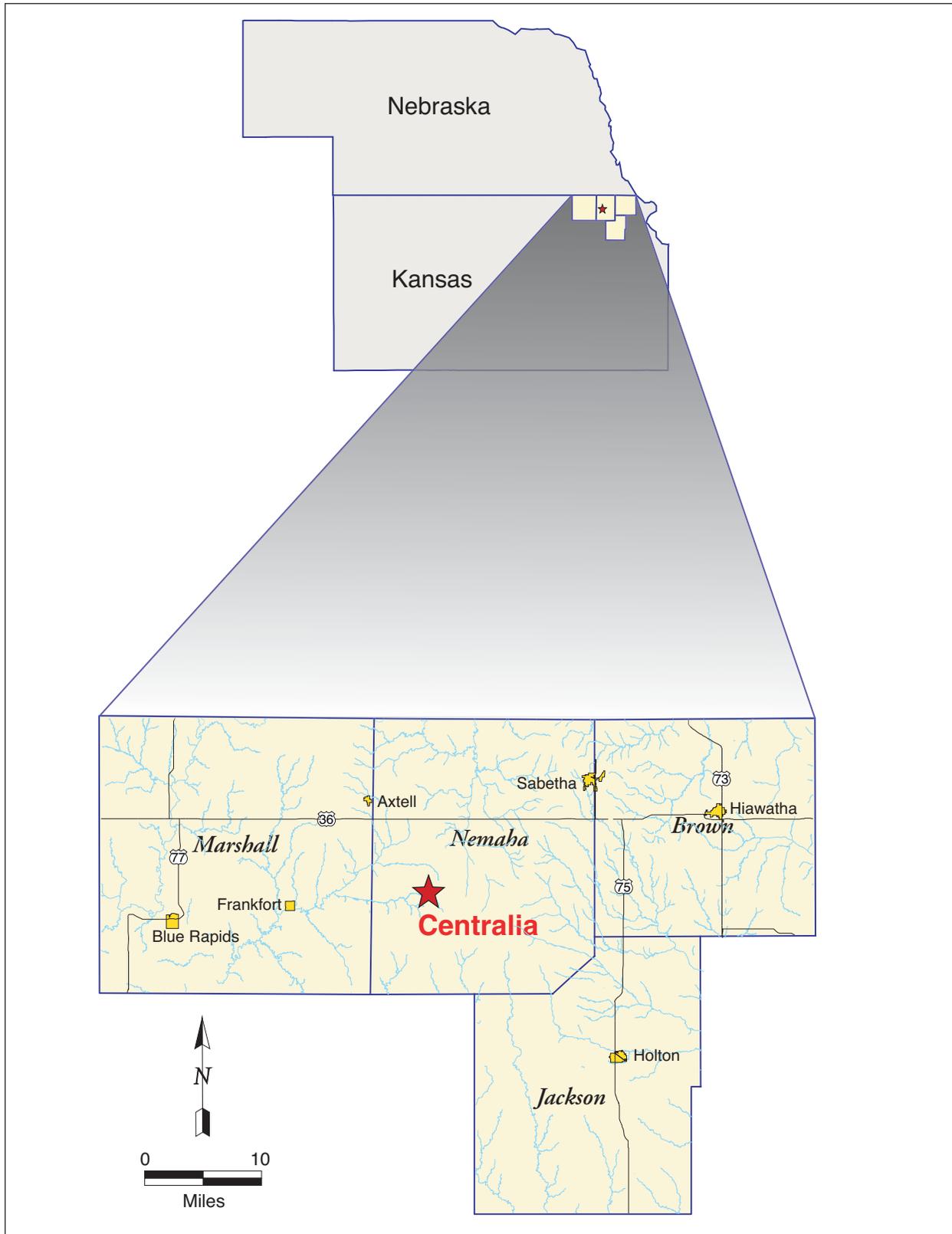


FIGURE 1.1 Location of Centralia, Kansas.

## 2 Background

Contaminated groundwater detected at the former CCC/USDA facility at Centralia is generally limited to the boundary of the former facility (Figure 2.1). Laterally, groundwater contamination is confined within a distance of less than 300 ft from the former facility. The lateral extent of the contaminated groundwater has been delineated by the locations of groundwater samples with carbon tetrachloride values not detected above a quantitation limit of 1.0 µg/L.

The vertical extent of the contaminated groundwater is limited to the upper portion of the shallow aquifer identified within the glacial outwash deposits of the Pleistocene Upper Independence Formation. The highest concentrations of carbon tetrachloride within the shallow aquifer are generally found in the upper 10 ft of the aquifer.

Groundwater samples collected in August 2004 were analyzed for natural attenuation parameters that are helpful in determining whether the subsurface environment is suitable to support natural *in situ* biodegradation of carbon tetrachloride. A preliminary screening of the results with the quantitative protocol provided by the U.S. Environmental Protection Agency (EPA 1998) indicated that conditions may be suitable for natural *in situ* biodegradation of carbon tetrachloride and that evidence exists for natural attenuation of carbon tetrachloride through reductive dechlorination. These results are in Table 2.2. Historic sampling results are presented in Table A.1, Appendix A.

TABLE 2.1 Analytical results for carbon tetrachloride, chloroform, and methylene chloride in groundwater samples collected from monitoring wells and piezometers at Centralia in 2002–2004.<sup>a</sup>

Well	Screen Interval (ft BGL)	Concentration (µg/L) in Sampling Event						
		Mar–Apr 2002		Jul 2004		Aug 2004		
		Carbon Tetra-chloride	Chloro-form	Carbon Tetra-chloride	Chloro-form	Carbon Tetra-chloride	Chloro-form	Methylene chloride
MW01 <sup>b</sup>	54.5–64.5	—	—	ND	ND	ND	ND	ND
MW02 <sup>b</sup>	49.5–59.5	—	—	300	8.4	215	6.2	ND
MW03 <sup>b</sup>	50.5–60.5	—	—	ND	ND	1.2	ND	ND
MW04 <sup>b</sup>	37.5–47.5	—	—	ND	ND	ND	ND	ND
MW05 <sup>b</sup>	34.5–44.5	—	—	ND	ND	ND	ND	ND
MW06 <sup>b</sup>	46.5–56.5	—	—	ND	ND	ND	ND	ND
SB01 <sup>c</sup>	40.0–50.0	128	31	NS	NS	186	6.5	ND
SB04 <sup>c</sup>	51.0–61.0	33	1.1	NS	NS	30	ND	ND
SB05 <sup>c</sup>	32.0–42.0	122	11	NS	NS	59	5.5	ND
SB07 <sup>c</sup>	48.0–55.0	6.4	ND	NS	NS	NS	NS	NS
SB08 <sup>c</sup>	52.0–62.0	130	1.3	NS	NS	79	3.1	ND
SB09 <sup>c</sup>	32.0–42.0	ND	ND	NS	NS	ND	ND	ND

<sup>a</sup> Abbreviations: ND, not detected at a quantitation limit of 1 µg/L; NS, not sampled.

<sup>b</sup> Well (4 in.) completed in July 2004; owned by the CCC/USDA.

<sup>c</sup> Piezometer (1 in.) completed in May 2002; owned by the CCC/USDA.

TABLE 2.2 Scoring of biodegradation processes at Centralia<sup>a</sup>

Constituent	Units	MW01		MW02		MW03		MW04		MW05		MW06		SB01		SB04		SB05		SB07 <sup>b</sup>		SB08		SB09	
		Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points	Conc.	Points
Dissolved Oxygen	mg/L	0.06	3	0.16	3	0.1	3	0.11	3	0.08	3	0.05	3	5.21	-3	3.78	0	NR <sup>c</sup>	NR	Unk <sup>d</sup>	Unk	0.16	3	0.26	3
Nitrate	mg/L	0.46	2	7.92	0	6.43	0	4.28	0	2.46	0	0.38	2	2.32	0	1.84	0	2.42	0	Unk	Unk	1.12	0	4.92	0
Iron II	mg/L	0	0	0.12	0	0.21	0	0.04	0	0.06	0	0	0	0	0	0.37	0	0.06	0	Unk	Unk	0.53	0	0	0
Sulfate	mg/L	5.83	2	5.45	2	8.63	2	10.7	2	4.56	2	5.72	2	10.6	2	5.89	2	6.07	2	Unk	Unk	8.51	2	32	0
Methane	mg/L	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	< 0.002	0	Unk	Unk	< 0.002	0	< 0.002	0
Oxidation-Reduction Potential	mV	230	0	235	0	230	0	210	0	215	0	215	0	210	0	230	0	220	0	Unk	Unk	235	0	185	0
pH	—	7.39	0	7.31	0	7.28	0	7.39	0	7.14	0	7.5	0	7.46	0	7.14	0	7.25	0	Unk	Unk	7.31	0	7.09	0
Total Organic Carbon	mg/L	ND <sup>e</sup>	0	1.84	0	1.14	0	ND	0	ND	0	1.62	0	4	0	3	0	2.26	0	Unk	Unk	1.88	0	1.94	0
Carbon Dioxide <sup>f</sup>	mg/L	25	0	20	0	55	1	40	0	25	0	15	0	30	0	55	1	25	0	Unk	Unk	20	0	75	1
Alkalinity <sup>f</sup>	mg/L	324	0	354	0	353	0	337	0	315	0	334	0	292	0	375	0	326	0	Unk	Unk	322	0	449	0
Chloride <sup>f</sup>	mg/L	12.3	0	7.95	0	20.6	0	10.1	0	4.58	0	9.25	0	61.8	1	40.3	1	51.9	1	Unk	Unk	17.9	0	14.8	0
Chloroform	µg/L	ND	0	6.2	2	ND	0	ND	0	ND	0	ND	0	6.5	2	ND	0	5.5	2	Unk	Unk	3.1	2	0	0
Dichloromethane (methylene chloride)	µg/L	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	Unk	Unk	ND	0	ND	0
Total points =>		7		7		6		5		5		7		2		4		5		—		7		4	

<sup>a</sup> Scoring is based on results for samples collected in August 2004. Points are interpreted as follows (EPA 1998):

- 0–5 Inadequate evidence for reductive dechlorination.
- 6–14 Limited evidence for reductive dechlorination.
- 15–20 Adequate evidence for reductive dechlorination.
- > 20 Strong evidence for reductive dechlorination.

<sup>b</sup> SB07 was not sampled, because the casing was blocked by a long-term water level recorder.

<sup>c</sup> NR, not recorded.

<sup>d</sup> Unk, unknown.

<sup>e</sup> ND, not detected at a quantitation limit of 1 µg/L.

<sup>f</sup> For evaluation of alkalinity, carbon dioxide, and chloride, MW01 (because of its location) was selected to represent background levels. For these constituents, points are awarded when the concentration is greater than twice the background concentration.

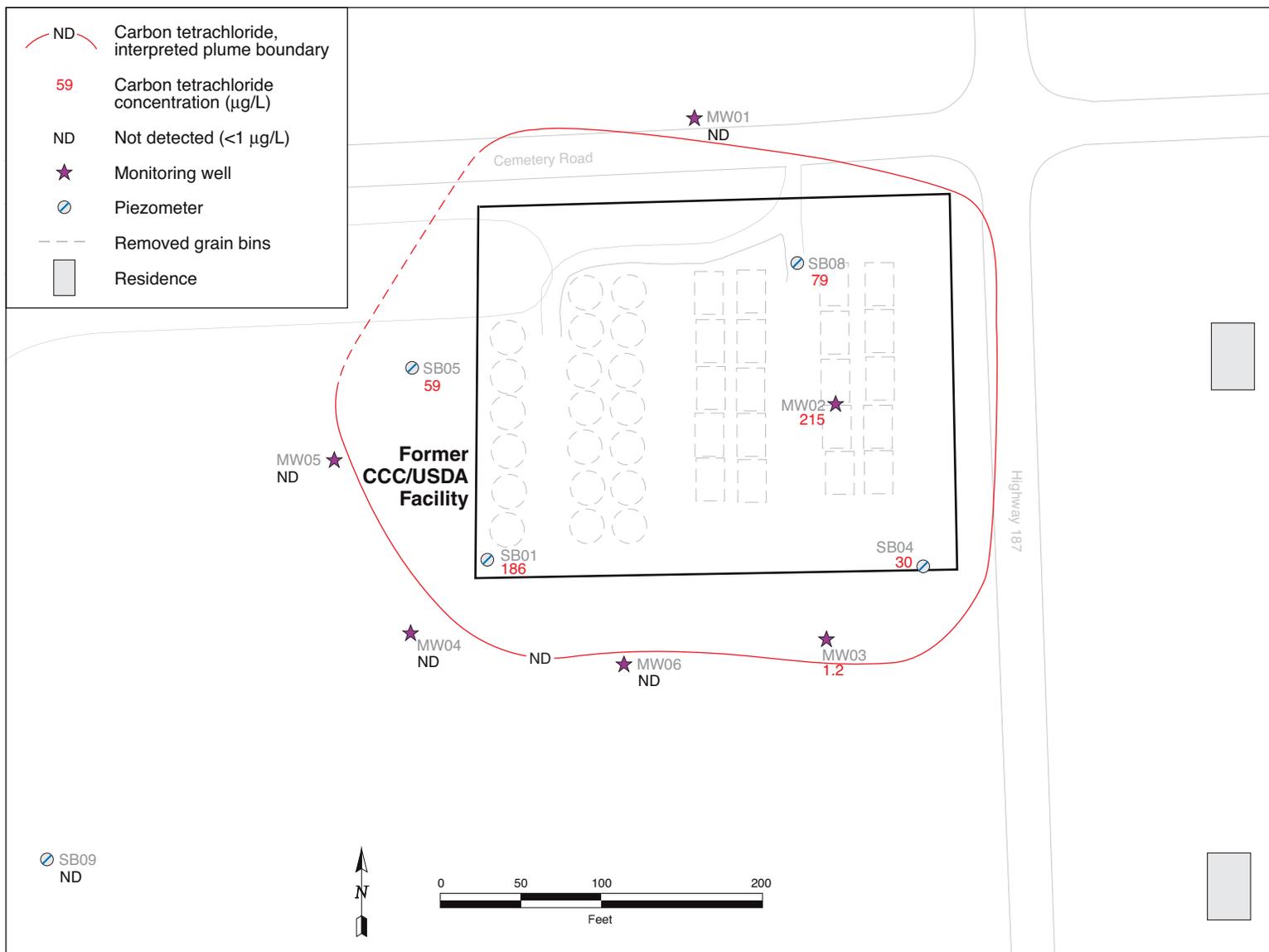


FIGURE 2.1 Distribution of carbon tetrachloride in groundwater in the shallow aquifer at Centralia in August 2004.

### 3 Monitoring Plan

#### 3.1 Monitoring Objectives

The objective of the monitoring program for Centralia is to collect groundwater samples twice yearly for at least 2 yr. The data to be collected are required to monitor changes in plume dynamics and to evaluate the suitability of monitored natural attenuation as a remedial option.

#### 3.2 Scope of Work

To satisfy the project objective, groundwater samples will be collected from the following monitoring wells and piezometers (Figure 3.1):

- Six monitoring wells (MW01–MW06)
- Six piezometers (SB01, SB04, SB05, and SB07–SB09)
- Additional monitoring wells to be installed per future agreement(s) between the CCC/USDA and the KDHE.

The strategy for collecting groundwater samples will include a thorough review of all historical analytical data. After the review, a list will be generated to determine the order for sampling the wells and piezometers. Wells/piezometers that have consistently shown no detectable concentrations of volatile organic compounds (VOCs) will be purged and sampled first. Wells that have shown VOCs contamination will be purged and sampled in the order of lowest contamination to highest contamination.

The primary tasks in the proposed sampling event are as follows:

1. Measure static groundwater levels and total depths in each well/piezometer.
2. Collect a sample from each well/piezometer for analysis of VOCs, including carbon tetrachloride, chloroform, and dichloromethane (methylene chloride).

3. Collect an additional aliquot from each well/piezometer for analysis of the following groundwater parameters:
  - Dissolved oxygen
  - Nitrate
  - Nitrite
  - Iron II
  - Sulfate
  - Sulfide
  - Methane
  - Oxidation-reduction potential
  - pH
  - Total organic carbon
  - Carbon dioxide
  - Alkalinity
  - Chloride
  - Temperature
  - Conductivity
  - Manganese
  - Phosphate
  
4. Collect an aliquot for laboratory analysis of dissolved hydrogen from a set of wells/piezometers approved by the KDHE.

### 3.3 Monitoring and Sampling Procedures

The monitoring and sampling of the wells and piezometers will be conducted in accordance with procedures described in the *Master Work Plan* (Argonne 2002, Sections 6.1.2 and 6.2), as follows:

- The well/piezometer number and the condition of the completion will be documented in the site notebook.
- The depth to groundwater and the total depth will be measured prior to purging.
- Prior to sampling, the wells/piezometers will be purged of a minimum of three well/piezometer volumes. Field parameters of pH, temperature, and conductivity will be measured during purging and will be allowed to stabilize before sampling begins.
- The wells and piezometers will be sampled after adequate recovery has occurred, but no more than 24 h after purging.
- Samples intended for analysis of VOCs (including carbon tetrachloride and chloroform) will be collected in laboratory-approved containers. The containers will be sealed and immediately placed in a cooler at 4°C. The samples will be shipped for overnight delivery to the Applied Geosciences and Environmental Management (AGEM) Laboratory at Argonne for analysis with a modification of EPA Method 524.2. An index to EPA methods is online (<http://www.epa.gov/epahome/index/>).
- All activities conducted and any deviations from normal procedures will be documented in the site field notebook. Approval for deviations or modifications will be sought from the CCC/USDA and KDHE project managers.

### **3.4 Sampling and Reporting Schedule**

The proposed monitoring events will be conducted approximately every 6 months for a period of 2 yr. The KDHE will be notified 14 days prior to each sampling event. After the groundwater data generated during the sampling event have been analyzed and validated, a report documenting the sampling activities and presenting the sampling results will be prepared and submitted to the KDHE within 90 days of the completion of field work.

The monitoring report will follow the guidelines for site monitoring established by the KDHE (1996). Accordingly, the report will include the following, at a minimum:

- A narrative of the work performed
- Static water level measurements
- Laboratory analytical data reports
- Summary tables presenting current and historical site data
- Results of analyses for natural attenuation parameters
- Maps depicting the sample locations, groundwater gradient, and contaminant levels
- Descriptions of any deviations from the approved sampling procedures
- Field documentation
- Quality assurance and quality control data

### **3.5 Quality Assurance and Quality Control**

Included in this section is a summary of methods that will be followed to meet quality assurance/quality control (QA/QC) standards. Descriptions of all QA/QC methods are in

Section 4.2 of the *Master Work Plan* (Argonne 2002). That document should be consulted for more a more detailed narrative of the QA/QC procedures.

The QA/QC requirements during field sampling are as follows:

- Ensure that samples collected are representative of current site conditions.
- Ensure that sample volume is sufficient to meet the monitoring goals.
- Ensure that field instrument calibration procedures are followed and that the appropriate number of field blanks, rinsate samples, trip blanks, and field replicates are collected. For this project, a minimum of one field blank, one rinsate sample, one trip blank, and one or two field replicates will be collected.
- In a bound notebook with printed page numbers, record all details of the work conducted. Use permanent ink for this documentation.
- To the extent possible, use disposable sampling equipment at each sampling location.
- Between sampling points, thoroughly rinse RediFlow pumps and hoses. Triple-wash all other nondisposable sampling equipment with a nonionic detergent in water, then rinse with water.
- Collect groundwater samples according to the procedures specified in Section 3.3.
- Label sample containers as instructed in Appendix D, Section D.1.4, of the *Master Work Plan* (Argonne 2002). At a minimum, include the following information: sample identifier, date, time, preservative, and intended analysis. Use preprinted sample labels for this task.

- Complete a preprinted Chain-of-Custody Record as instructed in Appendix D, Section D.1.5, of the *Master Work Plan* (Argonne 2002).
- Appropriately pack and seal shipping containers to ensure that chain of custody is maintained.
- Use preprinted shipping labels for sample containers being sent to laboratories for off-site analyses.

Laboratory QA/QC procedures are designed to ensure that sample integrity is maintained and that sample analysis is reproducible. This will be accomplished, in part, by verifying that laboratory-related field documentation is complete and that procedures have been followed with regard to Chain-of-Custody Records, sample storage, and sample holding times. In addition, laboratory procedures, equipment calibration, and performance standards (reproducibility, standards, spikes recoveries, etc.) will be reviewed and documented in the monitoring report discussed in Section 3.4.

Groundwater samples received at the AGEM Laboratory will be analyzed for VOCs as indicated in Section 3.3, within the specified holding times. For quality control purposes, selected samples will be analyzed by a second laboratory with the EPA's Contract Laboratory Program methodology.

Quality assurance records completed during the project will be maintained by the QA/QC coordinator and stored with the project files.

### **3.6 Health and Safety**

The general health and safety plan for use during this project, in Section 3 of the *Master Work Plan* (Argonne 2002), addresses all anticipated safety issues for the activities at the Centralia site. Specific emergency information for Centralia is provided below.

**Centralia has emergency 911 service.** All emergency calls, including police, fire, and ambulance calls, are directed for an appropriate response from this number. Centralia has an ambulance service with trained emergency medical technicians. The nearest hospital with

emergency medical facilities is in Seneca, Kansas. Driving directions to the hospital and a map showing the route are in Figure 3.2. Additional emergency information is in Table 3.1.

TABLE 3.1 Emergency information for field work at Centralia, Kansas.<sup>a</sup>

Resource	Telephone Number	Name
Ambulance	911	Centralia Ambulance Service and city fire and rescue department (volunteer fire department)
Hospital	(785) 336-6181	Nemaha Valley Community Hospital 1600 Community Drive Seneca, Kansas
Fire	911 or (785) 382-6224	Centralia Volunteer Fire Department Vermillion Fire Department
Police	911 (785) 336-2141 (785) 336-2311	Seneca Police Department (nonemergency) Nemaha County Sheriff (nonemergency)
Industrial hygiene	(630) 252-3310	Argonne-Industrial Hygiene
Safety	(630) 252-2885	EVS Division <sup>c</sup> Safety Officer (Monte Brandner)
Environmental concerns	(630) 252-3924 (630) 252-9553	EVS Division Regulatory Supervisor (Dave Peterson)
Security	(630) 252-5737	Argonne-Operations Security
Poison control	(800) 222-1222 or (913) 588-6633	Mid-America Poison Control Center University of Kansas Medical Center Kansas City, Kansas
Utilities survey	(800) 344-7233 (800) DIG-SAFE	Kansas One Call, Wichita, Kansas

<sup>a</sup> Post this table in the field operations base.

<sup>b</sup> The route from Centralia to the Nemaha Valley Community Hospital is shown in Figure 3.2.

<sup>c</sup> Environmental Science Division at Argonne.

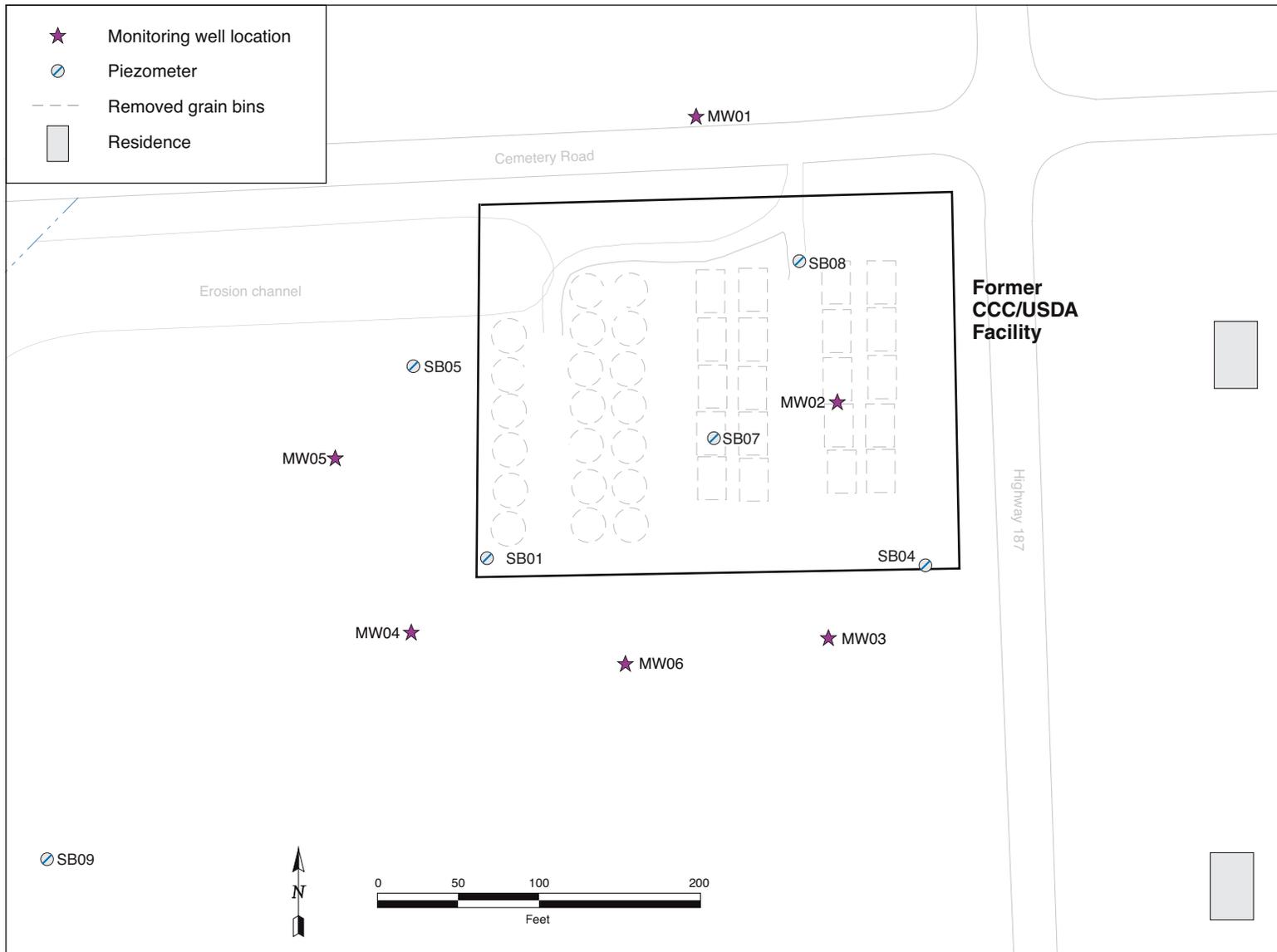


FIGURE 3.1 Locations of proposed monitoring points at Centralia, as of March 2005.

Directions from Centralia to Nemaha Valley Community Hospital  
in Seneca, Kansas (1600 Community Drive)

From Centralia proceed 8 mi north on Kansas Highway 187 to the junction with  
U.S. Highway 36.

Turn right onto U.S. Highway 36, and proceed east 2.5 mi.

Turn right onto Community Drive.

Proceed approximately 0.5 mi to the Nemaha Valley Community Hospital at  
1600 Community Drive. The emergency room is on the northeast side of the building.



FIGURE 3.2 Emergency route from Centralia to Sabetha Community Hospital.

## 4 References

Argonne, 2002, *Final Master Work Plan: Environmental Investigations at Former CCC/USDA Facilities in Kansas, 2002 Revision*, ANL/ER/TR-02/004, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, December.

Argonne, 2004, *Final Phase II Report: QuickSite Investigation, Centralia, Kansas*, ANL/ER/TR-03/006, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, March.

Argonne, 2005, *Draft Report: 2004 Monitoring Well Installation and Sampling at Centralia, Kansas*, ANL/ER/TR-04/011, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, August.

EPA, 1998, *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water*, EPA/600/R-98/128, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D. C.

KDHE, 1996, *Bureau of Environmental Remediation/Remedial Section Guideline: Scope of Work Site Monitoring*, BER Policy #BER-RS-036, Remedial Section, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, <http://www.kdhe.state.ks.us/remedial/download/monitor.pdf>.

**Appendix A:**

**Monitoring Well Construction Details  
and Historical Sampling Data**

TABLE A.1 Sampling and construction details for permanent monitoring locations at Centralia, Kansas, 2002–2004.<sup>a</sup>

Well <sup>b</sup>	Horizontal Location <sup>c</sup> (ft)		Completion Date	Surface Elevation (ft AMSL)	Reference Elevation <sup>d</sup> (ft AMSL)	Total Depth (ft BGL)	Screen Interval (ft BGL)			Filter Pack Interval (ft BGL)			Depth to Bedrock (ft BGL)	Depth to Water (ft BGL)	Sample Date	Carbon Tetrachloride (µg/L)	Chloroform (µg/L)	Nitrate as N (mg/L)
	Northing	Easting					Top	Bottom	Total	Top	Bottom	Total						
MW01	515257.2	1839058.4	07/19/04	1326.60	1329.3	67	54.5	64.5	10	52	67	15	NE	55.00	07/29/04	< 1	< 1	NA
														08/24/04	< 1	< 1	0.46	
MW02	515079.9	1839143	07/21/04	1335.20	1334.82	62	49.5	59.5	10	47	62	15	NE	51.00	07/29/04	300	8.4	NA
														08/26/04	215	6.2	7.92	
MW03	514935.9	1839135.8	07/22/04	1334.90	1334.7	63	50.5	60.5	10	48	63	15	NE	49.00	07/29/04	< 1	< 1	NA
														08/24/04	1.2	< 1	6.43	
MW04	514942.5	1838880.5	07/23/04	1323.10	1322.71	50	37.5	47.5	10	35	50	15	NE	38.00	07/29/04	< 1	< 1	NA
														08/24/04	< 1	< 1	4.28	
MW05	515049.6	1838835	07/27/04	1318.50	1318.11	47	34.5	44.5	10	32	47	15	NE	34.00	07/29/04	< 1	< 1	NA
														08/25/04	< 1	< 1	2.46	
MW06	514922.3	1839011.2	07/28/04	1330.10	1329.82	65	46.5	56.5	10	45	59	14	NE	43.00	07/29/04	< 1	< 1	NA
														08/25/04	< 1	< 1	0.38	
SB01	514987.31	1838927.09	05/08/02	1325.60	1325.16	50	40.0	50.0	10	38	50	12	NE	21.03	03/27/02	128	31	NA
														08/26/04	186	6.5	2.32	
SB04	514979.88	1839195.59	05/08/02	1336.20	1335.73	61	51.0	61.0	10	48	61	13	NE	23.03	03/27/02	33	1.1	NA
														08/26/04	30	< 1	1.84	
SB05	515105.24	1838883.36	05/08/02	1321.60	1321.28	42	32.0	42.0	10	32	42	10	NE	13.59	03/22/02	122	11	NA
														08/26/04	59	5.5	2.42	
SB07	515059.5	1839066.82	05/10/02	1332.40	1331.94	55	48.0	55.0	7	46	55	9	NE	17.75	04/08/02	6.4	< 1	NA
														08/27/04	NS	NS	NS	
SB08	515167.1	1839120.47	05/10/02	1333.00	1332.56	62	52.0	62.0	10	50	62	12	NE	19.86	04/08/02	130	1.3	NA
														08/26/04	79	3.1	1.12	
SB09	514805.65	1838853.42	05/10/02	1311.50	1311.04	42	32.0	42.0	10	30	42	12	NE	7.81	04/11/02	< 1	< 1	NA
														08/26/04	< 1	< 1	4.92	

<sup>a</sup> Abbreviations: AMSL, above mean sea level; BGL, below ground level, NA = not analyzed; NE = not encountered; NS = not sampled.

<sup>b</sup> Wells MW01–MW06 are 4-in. monitoring wells. Wells SB01, SB04, SB05, SB07, SB08, and SB09 are 1-in. piezometers. All are owned by the CCC/USDA. Each has a WWC-5 record filed with the state.

<sup>c</sup> Horizontal coordinates are target location centers. Northings and eastings are Kansas State Plane Coordinates. Horizontal datum is North American Datum 83.

<sup>d</sup> Vertical datum is National Geodetic Vertical Datum 88.