

Work Plan for Targeted Investigation at Benden, Kansas

Environmental Science Division



United States Department of Agriculture

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

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Work Plan for Targeted Investigation at Bendena, Kansas

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

August 2013



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Notation

AGEM	Applied Geosciences and Environmental Management
AMSL	above mean sea level
BGL	below ground level
CCC	Commodity Credit Corporation
CPT	cone penetrometer
d	day(s)
EPA	U.S. Environmental Protection Agency
ft	foot (feet)
gal	gallon(s)
gpm	gallon(s) per minute
hr	hour(s)
I.D.	inner diameter
in.	inch(es)
KDHE	Kansas Department of Health and Environment
MCL	maximum contaminant level
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
mg/L	milligram(s) per liter
mi	mile(s)
°C	degree(s) Celsius
ppbv	part(s) per billion by volume
ppm	part(s) per million
psi	pound(s) per square inch
PVC	polyvinyl chloride
RWD 2	Doniphan County Rural Water District No. 2
SDOH	Kansas State Department of Health
USDA	U.S. Department of Agriculture
VOC	volatile organic compound

Work Plan for Targeted Investigation at Bendena, Kansas

1 Introduction

During the 1950s and 1960s, the Commodity Credit Corporation (CCC), U.S. Department of Agriculture (USDA), operated a grain storage facility in Bendena, Kansas (Figure 1.1). During this time, commercial grain fumigants containing carbon tetrachloride were commonly used by the CCC/USDA and the private grain storage industry to preserve grain in their facilities. In February 1985, carbon tetrachloride was detected in Bendena's public water supply system during routine screening by the Kansas Department of Health and Environment (KDHE) at a level (10.9 $\mu\text{g/L}$) exceeding the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) and the KDHE risk-based standard of 5.0 $\mu\text{g/L}$ for this contaminant in drinking water (KDHE 1985a,b, 2010b). Subsequent KDHE investigations confirmed the presence of carbon tetrachloride in Bendena's public water supply well (Doniphan County Rural Water District No. 2 well, Figure 1.1) and also detected carbon tetrachloride in soils and groundwater at the former CCC/USDA facility and in groundwater beneath several commercial properties to the south and southeast of the former facility (KDHE 1988, 1998, 2010a).

To determine whether the former CCC/USDA facility represents a source of carbon tetrachloride contamination and its possible relationship to the carbon tetrachloride identified in groundwater, the CCC/USDA has agreed to conduct an investigation at Bendena, in accordance with the Intergovernmental Agreement between the KDHE and the Farm Service Agency of the USDA. The investigation will be performed on behalf of the CCC/USDA by the Environmental Science Division of Argonne National Laboratory, a nonprofit, multidisciplinary research center operated by UChicago Argonne, LLC, for the U.S. Department of Energy.

For this work plan, Argonne compiled historical data related to the CCC/USDA grain storage operations and previous investigations of the carbon tetrachloride contamination at Bendena, as well as other information pertinent to understanding this site. Through a review of all available documents, the KDHE (1988) identified the former CCC/USDA grain storage facility and the grain storage facility formerly operated by the Bendena Grain Co. as potential source areas for the carbon tetrachloride contamination. The former CCC/USDA facility was located on property now owned and operated as a grain storage facility by Johnson Farms, Inc.; the former Bendena Grain Co. facility was located on property that is now owned by Bendena

Ag., Inc. (Figure 1.2). Previous investigations and the potential source areas are discussed in Section 2.

On the basis of the analyses of the historical data, and in keeping with ongoing discussions with the KDHE and key property owners that affect critical site access, the following specific technical objectives are proposed for the targeted investigation at Bendena:

- Investigate the carbon tetrachloride contamination previously identified in soils and groundwater; evaluate the former CCC/USDA facility (on property now owned by Johnson Farms) as a potential source of contamination to the local groundwater.
- Investigate the distribution of carbon tetrachloride contamination in subsurface soils and groundwater beneath the properties currently owned by Bendena Ag and the Consumer Oil Co., south and southeast of the former CCC/USDA facility.
- Verify the lithologic and hydrologic characteristics of the unconsolidated geologic sequence hosting the groundwater flow system in the vicinity of the former CCC/USDA facility.
- Identify and document the patterns of groundwater flow and potential contaminant migration in the local hydrogeologic system.
- Update the inventory and status of local private wells; conduct limited private well sampling as appropriate, subject to access, to identify potential downgradient receptors.

The detailed scope of work is outlined in Section 3. The results of this study will provide the basis for determining, in consultation with the CCC/USDA and KDHE program managers, what future CCC/USDA actions might be necessary to achieve *no further action* status for the Bendena site.

Argonne issued a *Master Work Plan* (Argonne 2002) that has been approved by the KDHE. The *Master Work Plan* describes the general scope of all investigations at former

CCC/USDA facilities in Kansas and provides guidance for these investigations. In addition to Section 3.3 of this *Work Plan*, the *Master Work Plan* (Argonne 2002) should be consulted for complete details of plans for work associated with the former CCC/USDA facility at Bendena.

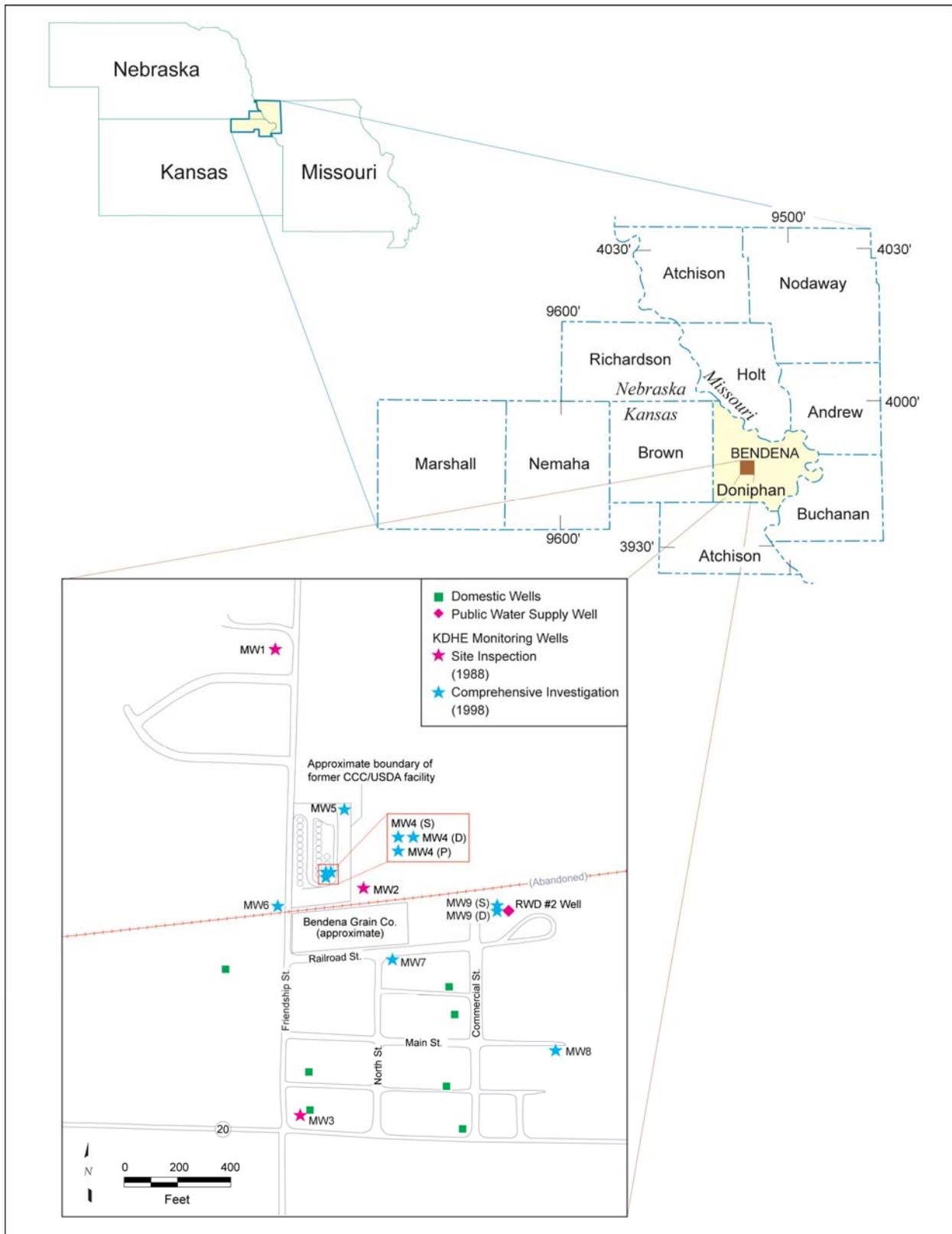


FIGURE 1.1 Location of Bendena, Kansas; the former CCC/USDA grain storage facility; and public, domestic, and monitoring wells.

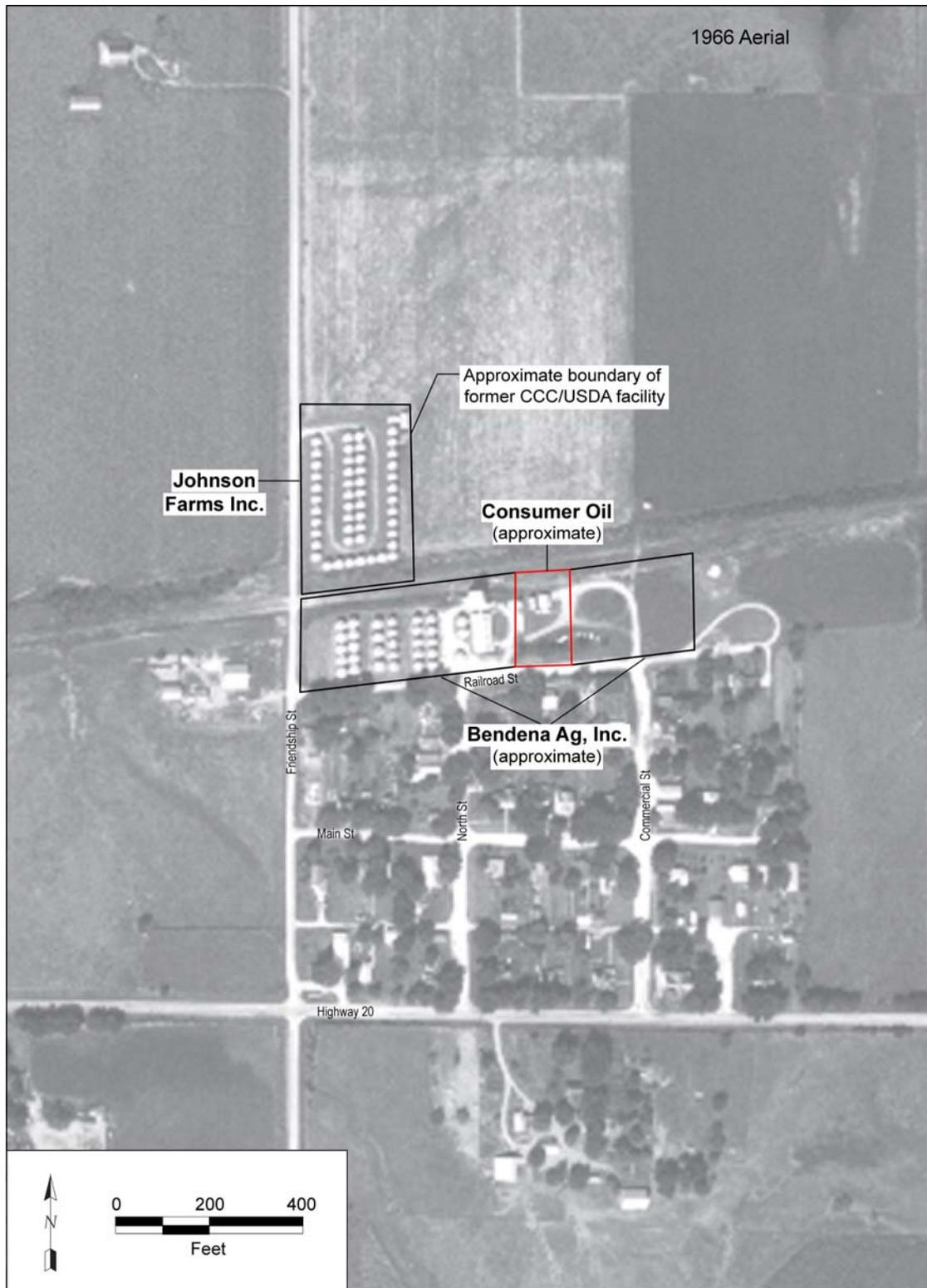


FIGURE 1.2 Locations of properties of interest in the investigation, showing grain storage structures in 1966. Source of photograph: USDA (1966).

2 Background and Previous Studies

2.1 Community Overview

Bendena, Kansas, founded in 1877, is an unincorporated rural town of approximately 117 persons (2010 Census) in northeastern Kansas (Independence Township, Section 33, Township 3 South, Range 20 East, Doniphan County), approximately 11 mi north of Atchison, Kansas, and 22 mi west of St. Joseph, Missouri (Figure 1.1). Businesses in the town include Bendena Ag, Inc.; the Consumer Oil Co.; Urban Construction, Inc.; and several others. The community also has a small grocery store, a bank, a post office, and a church. Sometime after the mid 1960s, a small housing development was constructed northwest of the original town. Since then, several individual newer homes have been constructed in the area. Historically, the Chicago and Rock Island Pacific Railroad served the community, but service has been discontinued, and the tracks have been removed.

Bendena is presently served by the Doniphan County Rural Water District No. 2 (RWD 2) system, which obtains its water supply from the Doniphan County RWD 5 and Atchison County RWD 5 systems. The town does not have a sanitary sewer system; all of the homes and businesses have individual septic systems.

2.1.1 Water Supply History

Prior to 1964, Bendena residents obtained water exclusively from private wells. In 1962-1963, the Doniphan County RWD 2 was formed to provide a public water supply by reconditioning a former railroad well near the northeast corner of the town for use as a municipal well (PWS1; Figure 2.1). Well PWS1 is a hand-dug, brick-walled well approximately 23 ft in diameter at the surface. The well decreases in size with depth and is approximately 73 ft deep. Well PWS1 was approved for use as a public water source by the Kansas State Department of Health in November 1964 (SDOH 1964).

As early as the mid 1970s, high concentrations of nitrate were detected in well PWS1. The average nitrate concentration from 1970 to 1983 was 36 mg/L (equivalent to parts per million, ppm), exceeding the EPA MCL of 10 mg/L for this substance in drinking water (KDHE 1988). In February 1985, carbon tetrachloride was also detected (at 10.9 µg/L) in a sample from

the municipal distribution system (Table 2.1). Because carbon tetrachloride is a suspected carcinogen, the KDHE initiated monitoring of the RWD 2 supply for volatile organic compounds (VOCs).

Shortly thereafter, the KDHE mandated changes to the RWD 2 supply system to bring the concentrations of nitrate and carbon tetrachloride in the water delivered to consumers into compliance with state drinking water standards (KDHE 1985a,b, 1986a,b). The actions taken included connection of the RWD 2 distribution system to the Doniphan County RWD 5 system to permit blending of the waters from well PWS1 and RWD 5 to achieve lower nitrate concentrations in the mixed waters, as well as the installation of an air stripping unit to treat the discharge from well PWS1 for carbon tetrachloride. These modifications were completed in 1988-1989 (KDHE 2010a).

Through the early 1990s, nitrate concentrations continued to rise in well PWS1. Consequently, the fraction of water pumped from well PWS1 and blended with water from RWD 5 progressively decreased. By 1992, blending of the PWS1 and RWD 5 supplies had become economically impractical, and in late 1993 or early 1994, RWD 2 stopped using well PWS1 and began purchasing water exclusively from Doniphan County RWD 5 (KDHE 2010a).

After the use of PWS1 was terminated, RWD 2 continued to purchase water from Doniphan County RWD 5. RWD 2 has also augmented its municipal supply via a connection to the Atchison County RWD 5, to increase the reliability of its supply and to improve delivery pressures in portions of the distribution system (Godfrey 2013).

2.1.2 History of Grain Storage Operations

Reviews of historical property documents, aerial photographs, and reports of interviews with individuals associated with the Bendena site indicate that grain storage operations were historically conducted on two adjacent parcels of land in the northwestern portion of the town during the period (prior to 1985) when grain fumigants containing carbon tetrachloride were in common use by the CCC/USDA and the private grain storage industry. These operations were run by the CCC/USDA and the Bendena Grain Company.

2.1.2.1 Former CCC/USDA Facility

Property and lease documents on file at the office of the Doniphan County Registrar of Deeds (included in Supplement 1, on the compact disc [CD] inside the back cover of this report) indicate that from May 1, 1954, until October 13, 1973, the CCC/USDA leased a parcel of land, approximately 1.5 acres, for a grain storage facility on the east side of Friendship Road and immediately north of the former railroad right-of-way. The property was originally leased from owner W.C. Albers and subsequently from the estate of Mr. Albers and then his son, Herbert Albers. After the termination of the CCC/USDA operations in 1973, the property remained in the ownership of Herbert Albers until September 1986, when it was conveyed to Paul and (wife) Mary Linn Johnson. In February 1993, ownership of the property was transferred to Johnson Farms, Inc., a Kansas corporation owned by Paul and Mary Johnson.

The detailed history of the grain storage activities on this property is not known; however, an aerial photograph shows that 49 round grain bins were located at the facility in 1966, during its occupation by the CCC/USDA (Figure 2.2). A later aerial photograph shows that 20 of the original bins and several larger, newer bins were present at the site in 1991 (Figure 2.3). At present, 18 of the original bins, 2 slightly smaller bins, and 7 larger bins are located on the property, which continues to be used by Johnson Farms for grain storage (Figure 2.1).

2.1.2.2 Former Bendena Grain Company Facility

Figures 2.2 indicates that 29 round grain bins, a grain elevator, a warehouse building, and several other structures were located on property immediately to the south and southeast of the former CCC/USDA facility in 1966. Property records indicate that prior to September 1981, the facilities in this area were located on right-of-way property owned by the railroad, and hence no lease or other legal documents pertaining to its occupancy are on record. Grain storage operations had been conducted on this property since the early 1900s by the Bendena Grain Company (KDHE 1988). Edwin Dennis Ford purchased half of the site facilities in 1968 and the other half in 1981 from the previous owners, Ben and Doris Ainley, who are deceased. The Bendena Grain Company, Inc., was established as a Kansas corporation by E.D. and Carolyn Ford in July 1980. In September 1981 the Fords obtained ownership of the parcel occupied by the grain storage facility, and in 1984 they acquired a second parcel to the east on the former

railroad right-of-way. The intervening parcel was obtained by the Consumer Oil Co. in November 1981 (Supplement 1).

In December 2004 the Bendena Grain Company was dissolved as a corporation. The parcels formerly owned by the Fords are now owned by Bendena Ag, Inc., and occupied by Bendena Ag and Urban Construction, Inc. Bendena Ag is owned by Patrick Urban.

Figure 2.3 shows that 25 round grain bins, the elevator, the warehouse building, and numerous other structures remained on the Bendena Grain property in 1991. None of the original round grain bins remain presently; however, the elevator and warehouse building are still present and in use at the site (Figure 2.1).

Efforts are continuing to augment the limited documentation available to the CCC/USDA and refine the representation of the Bendena Ag property boundaries in this *Work Plan*.

2.2 Previous Investigations

To date, the carbon tetrachloride contamination at Bendena has been addressed by the following KDHE investigations:

- 1985-1998: Sampling of well PWS1
- 1987: Preliminary assessment
- 1987-1988: Site inspection
- 1998: Comprehensive investigation
- 1999-2005: Sampling of selected monitoring wells
- 2009-2010: Supplemental site investigation
- 2013: Private well sampling

These prior investigations are discussed below.

2.2.1 Sampling of Well PWS1 in 1985-1998

On February 26, 1985, well PWS1 was sampled as part of a statewide investigation to determine the extent of VOCs contamination in public water supplies. Carbon tetrachloride was detected at 10.9 µg/L (KDHE 1987). Follow-up KDHE sampling of well PWS1 on March 11 and March 22, 1985, confirmed the initial analysis, with carbon tetrachloride concentrations of 10.9 µg/L to 14.0 µg/L being identified in samples from the well and the RWD 2 distribution system (Table 2.1).

Sampling of well PWS1 and the RWD 2 distribution system for VOCs analysis was conducted periodically from 1985 to 1989, during which time the KDHE directed RWD 2 to notify its customers of the carbon tetrachloride contamination and take actions to develop a new source of water free from any contamination (KDHE 1985a,b, 1986a,b). Carbon tetrachloride levels ranging from 6.4 µg/L to 23.8 µg/L were reported for PWS1 during this period.

In 1989, an air stripping unit was installed to treat the carbon tetrachloride contamination. The available records show that after this installation, well PWS1 was sampled only sporadically for VOCs analysis. The reported concentrations of carbon tetrachloride detected at PWS1 from September 1991 to June 1998 (the last reported sampling event) ranged from < 0.7 µg/L in September 1996 to 20.5 µg/L in June 1998 (Table 2.1).

2.2.2 Preliminary Assessment in 1987

Under a Multi-Site Cooperative Agreement with the EPA Region VII, in October 1987 the KDHE conducted a pre-National Priorities List preliminary assessment of the Bendena groundwater contamination site. This assessment included a physical site inspection, a review of local property records, and a compilation of analytical data from previous sampling of the Bendena public water supply (KDHE 1987). A soil gas investigation initiated during the time frame of the preliminary assessment report was documented as part of the subsequent site inspection (KDHE 1988).

2.2.3 Site Inspection in 1987-1988

The KDHE completed a site inspection for the Bendena site in September 1988. This study included reviews of local property records and documents, interviews with local residents and public officials, a soil gas survey, sampling of 18 private wells and well PWS1 for VOCs analysis, and the installation and sampling of 3 monitoring wells for VOCs analysis (KDHE 1988). The locations investigated during this study are shown in Figures 2.4 and 2.5.

Soil gas samples were collected at depths of 3-6 ft below ground level (BGL) at 12 locations, to aid in the identification of potential sources of the carbon tetrachloride contamination in groundwater (Figure 2.4). The sampling points were distributed on and near the former CCC/USDA and Bendena Grain Co. grain storage facilities (now the Johnson Farms and Bendena Ag properties, respectively; SG1-SG5), near contaminated well PWS1 (SG6-SG7), and at several other locations throughout the town (SG8-SG12; Figure 2.4) The soil gas samples were analyzed for carbon tetrachloride, 1,1,1-trichloroethane, trichloroethylene, toluene, and total hydrocarbons.

Trace to low levels of carbon tetrachloride, 1,1,1-trichloroethane, and trichloroethylene were detected in the soil gas at all of the sampled locations, with the highest concentrations of carbon tetrachloride occurring near the northern edge of the Bendena Grain property and at the southeast corner of the former CCC/USDA facility (at SG4 and SG3; Table 2.2 and Figure 2.4). The KDHE concluded that no distinct contaminant plume could be identified on the basis of these data, noting that underlying clays might act as a barrier to the upward migration of contaminant vapors (KDHE 1988).

Monitoring wells MW1-MW3 were installed during the site inspection, at completion depths ranging from 71.4 ft to 99.6 ft BGL (Figure 2.5 and Table 2.3). Although the wells were constructed with screened intervals of 10-15 ft, each well was equipped with a continuous gravel pack extending to within 25-26 ft of the ground surface. No carbon tetrachloride was detected at well MW1 or MW3; carbon tetrachloride was identified at a concentration of 62.9 $\mu\text{g/L}$ at MW2 (Table 2.1).

Carbon tetrachloride levels identified in well PWS1 during the site inspection ranged from 13.3 $\mu\text{g/L}$ to 20.3 $\mu\text{g/L}$ (Table 2.1).

The 17 private wells sampled for VOCs in this investigation included 12 wells located outside the immediate physical limits of the town (reported as being in use for domestic or livestock purposes), plus 1 domestic well, 1 lawn and garden well, and 3 wells reported as not in use in the town (Map 6 in KDHE 1988). The approximate locations of these wells are illustrated in Figure 2.5. With only one exception, no carbon tetrachloride was identified in the private wells (Table 2.1). The exception was concentrations of 2.6-2.9 $\mu\text{g/L}$ detected in the Ron Albers domestic well, roughly 0.5 mi west of Bendena (Figure 2.5). The KDHE reported that a line from the Bendena public water supply had recently been extended to the Albers residence at the time of the site inspection. No apparent link was suggested between the carbon tetrachloride contamination identified at the Albers well and at wells MW2 and PWS1 in the town (KDHE 1988).

2.2.4 Comprehensive Investigation in 1998

On behalf of the KDHE, in 1998 BE&K/Terranext conducted a comprehensive investigation at Bendena (KDHE 1998). Activities in this investigation included continuous coring of 6 deep borings to determine the local lithologic sequence and depth(s) to bedrock, the installation of 9 new monitoring wells, sampling of subsurface soils for VOCs analysis at one deep boring location, and sampling of groundwater for VOCs analysis (and nitrate analysis; see Section 2.2.8) at 12 previously existing and new monitoring wells, PWS1, and 4 private wells in the town. The locations investigated in the comprehensive investigation are illustrated in Figure 2.6.

At deep boring location MW4, in the south-central portion of the former CCC/USDA facility (Figure 2.6), 14 soil samples for VOCs analysis were collected at intervals of 4-5 ft to a maximum depth of 67 ft BGL. The results of these analyses (Table 2.4) indicate that quantifiable levels of carbon tetrachloride were detected in 4 samples, at depths ranging from 25 ft to 67 ft BGL and concentrations ranging from 3.2 $\mu\text{g/kg}$ to 100 $\mu\text{g/kg}$. Only one soil sample, collected at 50-52 ft BGL, had a reported carbon tetrachloride concentration (100 $\mu\text{g/kg}$) that exceeds the current KDHE risk-based standard for this contaminant in soils (73.4 $\mu\text{g/kg}$).

Nine new monitoring wells (MW4P,S,D, MW5-MW8, MW9S,D; Figure 2.6 and Table 2.3) were installed to intersect 3 potential aquifer units (*perched*, *shallow*, and *lower*) that had been recognized by the KDHE during the comprehensive investigation. The lithologic and hydrogeologic information obtained from these borings is discussed in Section 2.3. Groundwater

samples for VOCs analysis were collected from the new wells soon after each was installed and developed in March 1998 and again in April 1998, approximately 30 days after the final new well was completed. Groundwater samples for VOCs analysis were also collected as part of this investigation from previously installed KDHE monitoring wells MW1-MW3 in November 1997 and April 1998, as well as from well PWS1 in April 1998 (Figure 2.6). The results of the groundwater analyses are in Table 2.1.

Carbon tetrachloride was detected in groundwater at only three locations during the comprehensive investigation (Figure 2.6 and Table 2.1). At MW4 (at the former CCC/USDA facility), carbon tetrachloride was identified at concentrations of 2.6-18 µg/L at a depth of 20-30 ft BGL (MW4P) and 210-410 µg/L at a depth of 60-80 ft BGL (MW4S). The value of 410 µg/L for MW4S in March 1998 represents the highest concentration of carbon tetrachloride identified to date in groundwater at the Bendena site. No carbon tetrachloride was detected in deeper groundwater samples collected at this location (111-126 ft BGL; MW4D). Carbon tetrachloride was also identified in groundwater from monitoring well MW2 (75-120 µg/L; sand-packed from 25 ft to 99.6 ft BGL), as well as at trace levels (2.2-2.5 µg/L; at 45-65 ft BGL) in well MW9S, near well PWS1. No carbon tetrachloride was detected in groundwater sampled from four private wells (Holzhey, Johnson, Dickson, Phillips) and PWS1 during the comprehensive investigation (Figure 2.6 and Table 2.1).

2.2.5 Sampling of Selected Monitoring Wells in 1999-2005

The limited available data indicate that from 1999 to 2005, selected monitoring wells (MW2, MW4P,S,D, MW5, MW9S,D; locations in Figure 2.6) were sampled periodically by the KDHE for carbon tetrachloride analysis, in conjunction with sampling of the groundwater for nitrate analysis (Section 2.2.8). The available information indicates that groundwater samples for VOCs analysis were also collected from wells MW4P,S,D as part of a June 2009 nitrate sampling event (KDHE 2010a). The results of the VOCs analyses are summarized in Table 2.1.

With one exception, the occurrences of carbon tetrachloride identified from the analyses in 1999-2005 are generally consistent with those observed during the 1998 comprehensive investigation (Section 2.2.4). In June 2003, carbon tetrachloride was identified at 83 µg/L in well MW4D (Table 2.1); this detection is not corroborated by any other VOC analyses reported for this well to date.

2.2.6 Supplemental Site Investigation in 2009-2010

In late December 2009 to early January 2010, the KDHE conducted a supplemental site investigation to document the distribution of nitrate (see Section 2.2.8) and carbon tetrachloride contamination in the soils and groundwater (KDHE 2010a). The study was performed by using direct-push techniques to recover samples of groundwater (for analyses of nitrate, ammonia, and VOCs) and soils (for nitrate and ammonia analyses) at selected locations on the Johnson Farms (former CCC/USDA facility), Bendena Ag, and Consumer Oil properties. With the consent of the KDHE and the property owners and on behalf of the CCC/USDA, Argonne obtained split samples for VOCs analyses of both the soil and groundwater samples collected by the KDHE. The locations investigated during the supplemental site investigation are illustrated in Figures 2.7 and 2.8.

Shallow soil cores were collected by the KDHE to a depth of 5 ft BGL at 4 locations at the former CCC/USDA facility (SS01, SS02, SS11, SS12), 2 locations on the Consumer Oil property (SS25, SS26), and 20 locations on the Bendena Ag property (SS03-SS10, SS13-SS24; Figure 2.7). Samples from these cores were obtained by Argonne (from 5 ft BGL) for the VOCs analyses. No carbon tetrachloride was detected in any of the soil samples analyzed by Argonne. The KDHE did not analyze the soil samples for VOCs.

The KDHE was able to recover groundwater at 9 out of 10 locations targeted for groundwater sampling (GW01 through GW10; Figure 2.8). At each of these locations, discrete sampling from 3 depth intervals (corresponding to the inferred perched, shallow, and lower aquifer units; see Sections 2.2.4 and 2.3) was originally planned. Depths required to penetrate the lower aquifer (near the top of bedrock) could not be achieved, however, with the available direct-push equipment, and perched groundwater was recovered at only 1 (GW05P) of 4 locations initially attempted (GW03, GW05, GW08, and GW09; Figure 2.8). The field sampling plan was therefore altered to focus on retrieving groundwater from the inferred shallow aquifer, at the depth of refusal (from 57-79 ft BGL) of the direct-push rods at each sampling location (KDHE 2010a). The results of analyses of the groundwater samples for VOCs reported by the KDHE, with the corresponding values for split samples analyzed by Argonne, are in Figure 2.8 and Table 2.1.

Carbon tetrachloride was identified in the groundwater at 7 of the 9 sampled locations, and at 6 locations at concentrations greater than the KDHE risk-based standard and the EPA's

MCL of 5.0 µg/L for this contaminant. The highest concentrations of carbon tetrachloride reported by both the KDHE and Argonne laboratories were detected at locations GW02 (190-240 µg/L, at 69.5-74.5 ft BGL) and GW07 (190-244 µg/L, at 63-67 ft BGL), at the southeast corner of the former CCC/USDA facility (now Johnson Farms) and the eastern edge of the western Bendena Ag property, respectively (Figure 2.8).

2.2.7 Private Well Sampling in 2013

In coordination with the CCC/USDA, in 2012 the KDHE developed a work plan for groundwater sampling for VOCs analysis at the locations of six former CCC/USDA facilities in Kansas identified in the Intergovernmental Agreement between the KDHE and the USDA, including the former Bendena facility. On the basis of previous sampling activities performed at the site and a KDHE review of recent state well completion records, the KDHE identified 18 private wells within roughly 1 mi of Bendena for potential sampling; the locations of wells as identified in the KDHE work plan are shown in Figure 2.9 (KDHE 2012).

To date, Argonne has not received a detailed report of the private well sampling event. Data provided by the CCC/USDA indicate, however, that 8 private wells in the Bendena area were sampled by the KDHE in February 2013 (Table 2.5; CCC/USDA 2013). The well owners named in association with several of the sampled wells either do not correspond with those identified in the KDHE work plan or are incomplete (Figure 2.9 and KDHE 2012). The available results indicate, however, that carbon tetrachloride was detected in only one of the tested wells. A carbon tetrachloride concentration of 4.4 µg/L is reported for the “Albers” well; this observation is consistent with the low level of carbon tetrachloride detected in the Ron Albers domestic well during the 1988 KDHE site inspection (Section 2.2.3).

2.2.8 Additional Investigations Related to Soil and Groundwater Contamination

As noted in Section 2.1.1, concentrations of nitrate exceeding the EPA’s MCL of 10 mg/L for this contaminant in groundwater were initially identified at well PWS1 in the early 1970s, and increasing levels of this substance led to the discontinuation of use of PWS1 as a public water supply well in the early 1990s. Elevated nitrate concentrations were also historically identified in a number of the private wells and several monitoring wells sampled by the KDHE

during the 1988 site inspection and 1998 comprehensive investigation (Sections 2.2.3 and 2.2.4; KDHE 1988, 1998).

The nitrate contamination identified at Bendena is not linked to past operations at the former CCC/USDA grain storage facility.

Limited data available to Argonne indicate that, from 2001 to 2005, selected monitoring wells were sampled for nitrate (and carbon tetrachloride) analysis (KDHE 2010a). In 2005, the KDHE recommended that the area affected by groundwater contamination be divided administratively into two “sites” to facilitate investigation of the carbon tetrachloride and nitrate contamination issues separately, with the nitrate contamination being addressed under the KDHE’s State Water Plan. At that time, the nitrate component was added into the State Water Plan’s long-term monitoring program. Available documentation shows that periodic sampling of selected monitoring wells and well PWS1 by the KDHE for nitrate analysis occurred through at least 2009 (KDHE 2010a).

In December 2009 and January 2010, the KDHE performed soil and groundwater sampling as part of the supplemental site investigation (Section 2.1.5) to study the potential distribution of nitrate contamination in these media beneath the Johnson Farms, Bendena Ag, and Consumer Oil properties (KDHE 2010a).

Since the completion of the supplemental site investigation, both Johnson Farms and Bendena Ag have received approval from the KDHE for work plans submitted, and/or investigations conducted, to address nitrate contamination identified on these respective properties under individual agreements with the KDHE as part of the state’s Voluntary Cleanup and Property Redevelopment Program (Larsen 2012a,b; GSI 2011, 2012).

The CCC/USDA recently became aware of the installation of a series of shallow groundwater monitoring/observation wells in association with an investigation of leaking storage tanks on the Consumer Oil property. No further information is available at this time, and well registrations have not yet been posted on the online Kansas Geological Survey Water Well Completion Records Database.

Although the nitrate studies do not directly address the identified carbon tetrachloride contamination, limited information pertaining to the local geologic and hydrogeologic setting

provided in several of these reports is incorporated, as appropriate, into the discussions in Section 2.3.

2.3 Geologic and Hydrogeologic Setting

2.3.1 Regional Geology and Hydrogeology

Bendena lies in the Dissected Till Plains region of the Central Lowlands Province of the Missouri River Basin. In this area, unconsolidated glacial drift materials — primarily fine-grained till, with variably abundant lenses, stringers, or beds of coarser-grained glacial outwash, fluvial, and lacustrine materials — deposited during several periods of Pleistocene continental glaciation unconformably overlie an eroded bedrock surface composed primarily of interbedded Pennsylvanian age shales, limestones, and minor sandstones (Aber 1988). Since the retreat of the glaciers, these deposits have been modified by subsequent episodes of uplift and headward erosion along downcutting streams, coupled with the deposition of aeolian silts and clays (loess) on upland areas and alluvial sediments in the floodplains along major stream channels. A generalized stratigraphic column for the Doniphan County area is in Figure 2.10.

The modern topography of the Doniphan County area primarily reflects the more recent history of post-glacial erosion and deposition (Figure 2.11). Upland areas are generally smooth to gently rounded, with wide, gently sloping valleys along the major rivers and streams. Along the margins of the uplands, headward erosion along smaller tributary drainageways has resulted in a relatively dissected, hilly to rolling land surface (Dort 1987).

The regional stratigraphic and topographic relationships outlined above are illustrated schematically in geologic cross section A-A' (Figure 2.12), which extends approximately 17 mi from west to east through Bendena (Figure 2.13). Cross section A-A' was constructed by using lithologic data from test borings drilled and logged by the Kansas Geologic Survey, several public supply wells, and boring logs for several monitoring wells installed by the KDHE at the Bendena site. The logs represented in section A-A' are being provided under separate cover.

Figure 2.12 indicates that Bendena — particularly the former CCC/USDA facility — is located on a relative upland, overlying up to 140 ft of loess and glacial till materials. Figure 2.12 further demonstrates, however, that the thickness of the unconsolidated deposits can vary

significantly over relatively short lateral distances, because of the combined influences of topographic downcutting along drainageways and local variations in the elevation of the underlying bedrock surface.

In Doniphan County, groundwater levels have historically been mapped only in the alluvial deposits along principal streams (Bayne 1973). In these deposits, groundwater flow closely follows the surface elevation gradient downstream. Away from the streams, the highest groundwater elevations correspond with the topographically highest upland areas (Bayne 1973). Groundwater movement from these areas is necessarily downgradient to the lower elevations along the streams. A number of local topographically controlled flow systems might occur across the county. Within these flow systems, groundwater flow paths will be influenced by the distribution of higher-permeability, coarser deposits (sands and gravels) in the glacial materials. These flow paths might be locally complex. This is the pattern of groundwater movement mapped in the analogous glacial deposits of adjacent Brown County (Bayne and Schoewe 1967).

In the upland areas, the thickness of saturated materials can exceed 100 ft (Bayne and Schoewe 1967); water yields are low, however, because of the heterogeneous character of the glacial materials. In areas of thicker sands, moderate yields (20-40 gpm) are obtainable, but elsewhere yields from thin sands interbedded with the tills generally yield supplies of less than 10 gpm.

2.3.2 Local Setting

Bendena is located on the southeastern flank of a topographic high trending northwest-southeast that forms a local topographic and drainage divide through the community (Figure 2.14). The location of the former CCC/USDA facility lies along the gently sloping crest of this divide, at an elevation of about 1,125 ft above mean sea level (AMSL). Surface runoff from the area flows predominantly to the southwest and southeast into two small drainageways that merge approximately 0.25 mi south of the town. About 25 ft of topographic relief exists within the town.

2.3.2.1 Site-Specific Geology

The primary sources of existing site-specific geologic and hydrologic data for this investigation are the reports of the site inspection and comprehensive investigation studies conducted by the KDHE (1988, 1998), which include lithologic data for 12 borings advanced by the auger drilling method. Limited additional lithologic information for the shallower portions of the stratigraphic sequence is also provided in reports for investigations of nitrate contamination on the Johnson Farms property (Larsen 2012a,b). The geologic logs for the borings specifically discussed in this section are in the reports of previous investigations (KDHE 1988, 1998; Larsen 2012b).

During the 1988 site inspection, 3 borings drilled to reported depths of approximately 71-99 ft below ground level (BGL; completed as monitoring wells MW1-MW3; Figure 2.15 and Appendix A) did not fully penetrate the unconsolidated sequence to bedrock. Similarly, several borings more recently advanced and geologically logged on the Johnson Farms property (two of which were completed as monitoring wells MW10P and MW10S; Table 2.3, Figure 2.15, and Appendix A) penetrated to maximum depths of 63-65 ft BGL and did not reach bedrock (Larsen 2012a,b).

In the 1998 comprehensive investigation, 6 borings completed as monitoring wells MW4D, MW5-MW8, and MW9D (Table 2.3, Figure 2.15, and Appendix A) were continuously cored to refusal at or near the top of bedrock, at reported depths of 122-140 ft BGL. However, poor core recoveries in the deeper sections of several of these borings and apparent discrepancies in the lithologic descriptions presented in the geologic core logs (KDHE 1998), KDHE well registration documents (Appendix A), and interpretive diagrams for these borings (KDHE 1998) make it difficult to evaluate the vertical sequence of unconsolidated materials at depths greater than approximately 60-90 ft with confidence. Because of these factors, a detailed stratigraphic interpretation of the deeper subsurface cannot be developed on the basis of available data. In general, Argonne has employed the information presented in the geologic core log for each boring as the basis for the discussions that follow, under the assumption that these represent the most reliable descriptions of the lithologies encountered in previous drilling programs.

Figures 2.16-2.18 present three cross sections (B-B', C-C', and D-D'), based on the sources described above, illustrating the generalized stratigraphic sequence in the vicinity of the former CCC/USDA facility. The lithologic logs for borings included in these sections are in

reports of previous investigations (KDHE 1988, 1998; Larsen 2012b). The locations of the sections are shown in Figure 2.15.

The available geologic information suggests that the unconsolidated section at Bendena is broadly divisible into two stratigraphic units: (1) an *upper unit* consisting predominantly of clay to silty clay with some thin sand stringers with depth, but lacking significant deposits of coarser-grained materials, and (2) a more heterogeneous *lower unit* consisting of interbedded clays and silts with variably abundant disseminated gravel and discontinuous lenses, stringers, or beds of sand and gravel.

The available descriptions of the upper unit are relatively consistent from borehole to borehole. This unit is described primarily as brown, red-brown, or mottled gray clay or silty clay. Near the surface the clays are generally described as somewhat plastic, but they might become stiffer with depth. Most of the materials within the first 10 ft BGL are described as brown in color, becoming more gray-brown or mottled brown with depth. Regional data (Figure 2.12) suggest that 10-15 ft of loess is expected overlying a sequence of till at Bendena. Although it is not possible to identify a loess unit clearly from the available log descriptions, the existing information is generally consistent with this interpretation. The lower, generally stiffer portion of the upper unit (at depths of about 15-20 ft or more) might also represent loess or reflect a transition to fine-grained glacial material. An apparently discontinuous layer of caliche or a thin “hard zone” reported in several borings at elevations of approximately 1,060-1,080 ft AMSL might represent a paleosol horizon. Minor, thin sand beds or partings are occasionally reported near the base of the clay-silt unit.

The available descriptions of the lower unit suggest that this interval is composed of glacial till. Fine-grained intervals in the unit are described as gray to black or occasionally red-brown clay or silt, often containing disseminated gravel. Interbedded lenses of sand and gravel are heterogeneously distributed and vary in character, ranging from fine gray or brown sand to coarse gray sand with gravel. The sands are often described as subangular to subrounded, consisting of quartz with some feldspar and occasional limestone. The coarse-grained deposits vary in thickness from a few inches to several feet or more; in some cases they are stacked to produce sequences several feet thick. Both the vertical sequence and the relative abundance of interbedded fine and coarse-grained materials vary significantly from borehole to borehole; coupled with the limited core recovery in many of the deeper intervals, this variability precludes

correlation or determination, with confidence, of the thicknesses of individual coarse-grained or fine-grained deposits across the investigation area.

Except for gray shale encountered at a depth of 132.5 ft BGL at MW6 and at 120 ft BGL at MW8, no other investigative borings have recovered samples of the local bedrock. The top of bedrock illustrated in the cross sections has been interpreted primarily on the basis of auger refusal. The inferred bedrock surface might slope gently to the south (Section C-C'; Figure 2.17); this surface and the suggested thickness of the unconsolidated section are consistent with the regional-scale stratigraphy and mapping of the bedrock surface.

2.3.2.2 Site-Specific Hydrogeology

The KDHE measured groundwater levels in monitoring wells MW4P,S,D, MW5-MW8, and MW9S,D on April 13, 1998, prior to purging and sampling of these wells over a three-day period (Appendix E in KDHE 1998). These data (Figures 2.16-2.18) appear to represent the most recent coincident set of water level measurements made in all of the permanent monitoring points available at Bendena at any given time. Monitoring wells MW10P and MW10S (Larsen 2012b) were installed after the April 1998 measurement event. A compilation of reported groundwater level measurements for the monitoring wells is in Table 2.6.

At locations MW4 and MW9 with multiple wells (Figure 2.17), the measured levels on April 13, 1998, and subsequently (Table 2.6) indicate the presence of variable downward (vertical) hydraulic gradients in the flow system. Where monitoring wells are screened in sands and gravels, the indicated levels fall within the overlying, presumably less permeable fine-grained materials, suggesting that at least semi-confined conditions exist for the penetrated sand lenses.

In the comprehensive investigation report (KDHE 1998), the water levels measured in April 1998 were interpreted as representing three distinct water-bearing units: (1) a *perched aquifer* in the upper portion of the upper (clay-silt) unit (identified only in well MW4P), (2) a *shallow aquifer* near the base of the upper (clay-silt) unit (wells MW4S and MW9S), and (3) a *lower aquifer* in the lower (till) unit (wells MW4D, MW5-MW8, and MW9D). This terminology and the hydrostratigraphic interpretation were employed in subsequent reports of the KDHE and other investigations; in some cases they have been used as a basis for targeting borings for

groundwater sampling across the area, in the absence of more location-specific hydrogeologic data (KDHE 2010a; Larsen 2012a,b). In light of the interpretive and practical significance associated with this terminology, each of these units is reviewed in detail below, on the basis of presently available data, to evaluate its apparent hydrogeologic characteristics.

Perched Aquifer

The *perched aquifer* was identified by the KDHE from the observation that during drilling at the MW4 location (Figures 2.16 and 2.17), water entered the borehole at a depth of approximately 25 ft BGL (in the clay-silt unit) and flowed downward. No sand was observed at this depth, and the flow of groundwater was attributed to a thin zone in the clay possessing secondary porosity (KDHE 1998).

The perched aquifer was not reported in soil borings MW5-MW9. Similarly, monitoring well MW10P (Figure 2.16) and an investigative boring completed at a depth equivalent to that of MW4P (25 ft BGL), approximately 250 ft north of MW4P at the former CCC/USDA facility, failed to produce sufficient groundwater for sampling from this targeted unit (Larsen 2012a,b). Three direct-push borings targeted in this unit on the Bendena Ag property to the south and southeast of MW4P (locations GW03, GW08, and GW09; Figure 2.8) also failed to produce groundwater in a reasonable time frame for sampling (KDHE 2010a). Several other investigative borings advanced to the perched aquifer at the former CCC/USDA facility successfully recovered groundwater for sampling, but the observed water accumulation rates were very slow (Larsen 2012a). Together, these observations suggest that the perched aquifer as recognized at MW4 might not be widely or uniformly developed, instead representing potentially localized occurrence(s) of slightly more favorable, saturated permeability within the generally fine-grained upper portion of the clay-silt unit.

The characteristics reported for the perched aquifer at MW4 (KDHE 1998) do not necessarily indicate the presence of a true perched aquifer, in the sense that the materials underlying the zone are not saturated with water. Rather, the permeability of the surrounding fine-grained materials might be sufficiently low to preclude the release of groundwater present in the sediments at a rate conducive to direct observation, or to permit groundwater sampling over a relatively short period. This possibility is supported by observations that the fine-grained materials in the shallower part of the clay-silt unit have generally been described as “sticky” and

“damp” to “moist” or “wet” (KDHE 1998; Larsen 2012a,b), suggesting that they might be water-saturated.

Only two monitoring wells have been completed in the perched aquifer: MW4P and MW10P, at depths of 25-30 ft BGL on the former CCC/USDA facility (now Johnson Farms) property (Figure 2.15). No potential groundwater flow direction can be estimated for this unit, and no coincident measurements of groundwater levels have been obtained from these wells. Well MW10P was reported as “dry” following its installation in July 2012 (Larsen 2012b).

Shallow Aquifer

Three monitoring wells have been completed in the *shallow aquifer* (MW4S, MW9S, and MW10S; Figure 2.15), at depths of approximately 65-82 ft BGL (Table 2.3) — near the base of the upper (clay-silt) unit or the top of the lower (till) unit (Figures 2.16 and 2.17). Lithologic logs for the MW4 and MW9 locations (KDHE 1998) indicate predominantly clay to silty clay in the screened intervals at these wells, with a few thin horizons of wet sand. At MW10, only moist to wet silty clay is indicated (Larsen 2012b). Estimates of the hydraulic conductivity of the thin sands penetrated at MW4S and MW9S, calculated on the basis of grain size analyses, ranged from approximately 10 ft/d to 22 ft/d (KDHE 1998).

Poor core recovery at the MW4 location has hampered identification of the potential total thickness of sand stringers that might be present in and near the interval screened in MW4S (60-80 ft BGL). Somewhat better core recoveries at the MW9 location (MW9S, screened at 45-65 ft BGL), however, resulted in reports of thin wet intervals occurring periodically throughout the underlying interval, from 65 ft BGL to the depth of auger refusal at 128 ft BGL. This finding provides little clear hydrostratigraphic basis for distinguishing the vertical limits of the shallow aquifer as a unique water-bearing unit. Similarly, the screened interval indicated for monitoring well MW10S (approximately 45-65 ft BGL; Table 2.3) appears to fall at a depth (and elevation) intermediate between the nearby MW4P (perched aquifer) and MW4S (shallow aquifer) screened intervals.

Lithologic logs for the remaining deep borings (MW5-MW8; KDHE 1998) also show various wet intervals associated with silty clays, fractured clays, and thin sands sporadically distributed both above and below the depths (and elevations) screened in the MW4S, MW9S,

and MW10S wells, clouding the definition of the shallow aquifer. As noted for the perched aquifer, the available data for the shallow aquifer and surrounding sediments suggest that groundwater saturation might be present throughout much of the subsurface at Bendena, though it might be readily evident only in zones possessing relatively greater primary or secondary permeability.

Three monitoring wells (the minimum required for estimation of a linear flow direction) are currently identified as representing the shallow aquifer; however, no concurrent measurements of the static groundwater levels in these wells have been made to date. Further, the recognized presence of vertical hydraulic gradients and lithologic heterogeneity in the hydrostratigraphic sequence suggest that multiple groundwater level monitoring points completed in each potential water-bearing interval of interest might be required to accurately estimate the vertical and lateral direction(s) of groundwater movement through the local flow system at any given location and depth.

Lower Aquifer

The *lower aquifer*, as described in the comprehensive investigation report (KDHE 1998), consists predominantly of dense, low-permeability silts interbedded with layers of more permeable silts and sands of variable thicknesses. The inferred vertical extent of the lower aquifer is not clearly defined. Across the site, individual lenses of coarser-grained materials in the till cannot be correlated reliably among boreholes, but they appear to occur variably throughout the vertical extent of the till (and into the lower portion of the overlying clay-silt unit). The presently existing monitoring wells that penetrate the lower aquifer, MW4D, MW5-MW8, and MW9D (Figures 2.16-2.18), are generally completed in the lowest portion of the till complex (at depths of approximately 120-140 ft BGL; Table 2.3) but are not screened consistently relative to lithology, elevation within the unit, or position relative to the inferred bedrock surface. Estimates of the hydraulic conductivity of the thin sands penetrated at MW4D and MW9D, calculated on the basis of grain size analyses, ranged from approximately 6 ft/d to 11 ft/d (KDHE 1998).

Three monitoring wells installed by the KDHE in 1988, described as penetrating the lower aquifer (MW1-MW3; Figures 2.15-2.17) were completed in the upper to middle portions of the till complex at depths of approximately 71-99 ft BGL (KDHE 1988, 1998). These wells

were abandoned by the KDHE in 2006 because of the presence of continuous gravel packs that extended to within 25-26 ft of the ground surface (Table 2.3 and Appendix A), thus providing artificial conduits for the potential vertical migration of groundwater and contaminants between the shallower and deeper portions of the local hydrogeologic system. The KDHE reported that the upper portion of the casing in each well was removed, while the remaining lower casing was plugged with pumpable grout; however, the continuous gravel packs could not be removed (KDHE 2010a).

In the comprehensive investigation report, the KDHE (1998) presented an interpretation of the April 1998 groundwater levels measured in wells MW4D, MW5, MW6, MW8, and MW9D as indicating groundwater flow in the lower aquifer to the east-southeast (Figure 7 of the comprehensive investigation report [KDHE 1998]); water levels measured in wells MW1-MW3 were not included in this evaluation, because of the extended gravel packs noted above. In coming to this conclusion, however, the KDHE also rejected the measured water level for monitoring well MW7, under the assumption that this well is completed in a lower hydrogeologic unit than the surrounding monitoring wells. This assumption is not supported, however, by Figure 2.18, which illustrates that the screened intervals in adjacent wells MW6, MW7, and MW8 are located at consistent elevations and positions with respect to the underlying bedrock surface (although variations are evident in the specific lithologies screened in each deep well).

If the water level measurement for well MW7 is included in the 1998 data set for the lower aquifer monitoring wells, the resulting (mechanically contoured) potentiometric surface shown in Figure 2.19 suggests that ambient groundwater flow in the deepest part of the unconsolidated sequence (the lower portion of the till) might be generally toward the south across much of the Bendena investigation area, from a possible local high at the former CCC/USDA (now Johnson Farms) property. This observation suggests an element of topographic control on the local groundwater flow system, as Figure 2.14 indicates a drop in the local land surface elevation, to levels of approximately 1,060 ft AMSL or less, toward the headwaters of the intermittent creek valley directly south of the town. Nevertheless, the presence of the vertical gradients noted above, as well as variations in the relative permeabilities of the heterogeneously distributed lithologies in the till complex, are likely to influence the actual detailed pathways of groundwater (and potential contaminant) migration throughout the groundwater flow system.

2.3.2.3 Possible External Influences on the Local Groundwater Flow System

As outlined in Section 2.1.1, since the early-mid 1990s the community of Bendena has received its water supply from a public water system (Doniphan County RWD 2) that obtains water from sources exclusively outside the Bendena area. Prior to 1964, however, the residents of the town obtained groundwater for domestic and other purposes from individual private wells. From 1964 to approximately 1994, groundwater was supplied to the RWD 2 system by well PWS1 at the northeastern corner of the town.

No records pertaining to the specific historic use or potential current use (domestic, stock watering, lawn and garden, etc.) of private wells in the immediate vicinity of the former CCC/USDA facility and the town are presently available to Argonne. However, some private wells remained available for sampling by the KDHE in 1988, 1998, and 2013 (KDHE 1988, 1998, 2012; CCC/USDA 2013).

Limited information reported for well PWS1 indicates that, when it was approved for public water supply use in 1964, it was equipped with a submersible pump capable of flowing up to 35 gpm at a working pressure of 40 psi. Reports further indicate that this well initially (in 1964) filled the 38,000-gal water storage standpipe in the town in approximately 11 hr, with little observed drawdown in the well (Duncan 1964). In 1988, the KDHE reported the pumping rate of PWS1 (while operating as a municipal supply well) as 16-20 gpm (KDHE 1988). Historically, the town's water usage from well PWS1 before connection of the municipal system to the RWD 5 supply was reported in 1987 as approximately 3 million gallons per year or about 250,000 gal per month (Novak and Lay 1987). In late 1993 or early 1994, the use of PWS1 as a public supply well was terminated because of persistent high nitrate levels (Section 2.1.1).

The potential impact of the former use of private wells and well PWS1 on the groundwater flow system at Bendena has not been fully evaluated. Because the use of these wells spans much of the period following the termination of the grain storage operations at the former CCC/USDA facility, as well as the later grain storage activities on this property and at the Bendena Grain facilities (during which carbon tetrachloride contamination was detected in the groundwater and at PWS1), the possible hydraulic influence of these wells on the natural patterns of groundwater flow should be considered in evaluating the present distribution of this contaminant and the historic and modern patterns of groundwater flow and possible contaminant migration.

2.3.3 Summary

The presently available site-specific data for the investigation area are consistent with the regional geologic and hydrogeologic setting, suggesting that the local groundwater flow system is developed within a relatively thick sequence of unconsolidated clays, silts, and silty clay till that contain heterogeneously distributed and relatively discontinuous deposits of more permeable silts, sands, and gravels. Previous studies have nominally identified several possible water-bearing units (perched, shallow, and lower aquifers) in this sequence; however, the detailed distribution, internal characteristics, and potential groundwater flow direction(s) in these units and the greater flow system remain unclear. Measurements of the local groundwater levels in a limited number of permanent monitoring wells indicate that significant but variable vertical gradients in the hydrogeologic system, coupled with the lithologic heterogeneity noted above, are likely to influence the detailed pathways for groundwater flow and potential contaminant migration in the saturated sediments.

TABLE 2.1 Analytical results for VOCs in groundwater, 1985-2010.

Reported Sampling Location	Sample Date	Concentration (µg/L)		Notes on Result/Source
		Carbon Tetrachloride	Chloroform	
<i>Results for well PWS1 and RWD 2 Distribution System, 1985-1998</i>				
RWD 2	2/26/1985	10.9	NR ^a	Plant tap
PWS1	3/11/1985	11.5	NR	
PWS1	3/11/1985	10.9	NR	
RWD 2 distribution	3/22/1985	14	NR	Consumer Oil Co.
PWS1	3/22/1985	11.5	NR	Godfrey residence
RWD 2 distribution	7/29/1985	7.8	NR	
PWS1	7/29/1985	6.4	NR	In KDWW ^b
RWD 2 distribution	9/11/1985	11.1	NR	
PWS1	4/15/1986	11	NR	
PWS1	7/23/1986	12	NR	
PWS1	12/17/1986	7.7	NR	
PWS1	12/17/1986	6.4	NR	
PWS1	12/17/1986	14.4	NR	In KDWW
PWS1	4/22/1987	17.4	NR	In KDWW
PWS1	1/12/1988	14.8	NR	
RWD 2 distribution	2/9/1988	12.7	NR	St. John's Church
PWS1	2/9/1988	13.3	NR	In KDWW
PWS1	5/18/1988	20.3	NR	
PWS1	5/4/1989	23.8	NR	In KDWW
PWS1	9/17/1991	17.2	NR	In KDWW
RWD 2-RWD 5	9/17/1991	< 0.5	NR	Blended
RWD 2-RWD 5	9/17/1991	< 0.5	NR	Blended
RWD 2-RWD 5	9/25/1991	0.8	NR	Blended
RWD 2-RWD 5	11/5/1991	< 0.5	NR	Blended
PWS1	4/22/1992	9.1	NR	
RWD 2-RWD 5	4/22/1992	< 0.5	NR	Blended
RWD 2 distribution	6/18/1992	< 0.5	NR	
RWD 2 distribution	6/22/1992	< 0.5	NR	
RWD 2 distribution	6/22/1992	< 0.5	NR	St. John's Church
RWD 2 distribution	9/11/1992	< 0.5	NR	
RWD 2 distribution	4/27/1994	< 0.5	NR	Weiland Grocery
PWS1	9/4/1996	< 0.7	NR	
PWS1	4/15/1998	< 5	56	
PWS1-RWD 2	6/11/1998	ND ^c	NR	Sampling point unspecified
PWS1-RWD 2	6/15/1998	20.5	NR	Sampling point unspecified
<i>Results from the KDHE site inspection (1988)</i>				
Albers, R., well	1/12/1988	2.9	NR	
Albers, R., well	5/18/1988	2.6	NR	
Atwater, J., well	1/12/1988	< 0.7	NR	
Clark, J., well	4/14/1988	< 0.7	NR	
Dickson, B., well	4/8/1988	< 0.7	NR	
Johnson, C., well	1/12/1988	< 0.7	NR	
Johnson, G. feedlot well	5/18/1988	< 0.7	NR	
Johnson, R., well	1/12/1988	< 0.7	NR	
Kentzler, M., well	4/8/1988	< 0.7	NR	
Myers, P., well	1/12/1988	< 0.7	NR	
Pope, D., well	1/12/1988	< 0.7	NR	
Foster, L., well	1/12/1988	< 0.7	NR	

TABLE 2.1 (Cont.)

Reported Sampling Location	Sample Date	Concentration (µg/L)		Notes on Result/Source
		Carbon Tetrachloride	Chloroform	
<i>Results from the KDHE site inspection (1988) (cont.)</i>				
Holzhey, G., well	4/8/1988	< 0.7	NR	
Rush, D., well (bottom)	1/12/1988	< 0.7	NR	
Rush, D., well (top)	1/12/1988	< 0.7	NR	
Rush, F., well	1/12/1988	< 0.7	NR	
Staudenmaier, C., well	1/12/1988	< 0.7	NR	
Staudenmaier, P., well	1/12/1988	< 0.7	NR	
MW1	4/14/1988	< 0.7	NR	
MW1	5/18/1988	< 0.7	NR	
MW2	5/18/1988	62.9	NR	
MW3	4/8/1988	< 0.7	NR	
MW3	5/18/1988	< 0.7	NR	
<i>Results from the KDHE comprehensive investigation (1997-1998)</i>				
Dickson, B., well	11/18/1997	< 1	< 1	
Dickson, B., well	4/13/1998	< 1	0.99	
Holzhey, G., well	11/18/1997	< 1	< 1	
Holzhey, G., well	4/13/1998	< 1	< 1	
Johnson well	4/13/1998	< 1	57	
Phillips well	4/13/1998	< 1	< 1	
Phillips well	11/18/1998	< 1	< 1	
MW1	11/18/1997	< 1	< 1	
MW1	4/13/1998	< 1	< 1	
MW2	11/18/1997	120	1.9	
MW2	3/3/1998	120	NR	
MW2	4/15/1998	75	2	
MW3	11/18/1997	< 1	< 1	
MW3	4/13/1998	< 1	< 1	
MW4D	3/10/1998	< 1	< 1	
MW4D	4/15/1998	< 1	< 1	
MW4P	3/3/1998	18	6.4	
MW4P	4/15/1998	2.6	< 1	
MW4S	3/12/1998	410	10	
MW4S	4/15/1998	220	< 1	
MW4S (duplicate)	4/15/1998	210	< 1	
MW5	3/3/1998	< 1	< 1	
MW5	4/15/1998	< 1	< 1	
MW6	2/26/1998	< 1	1.6	
MW6	4/14/1998	< 1	< 1	
MW7	2/26/1998	< 1	< 1	
MW7	4/14/1998	< 1	< 1	
MW8	2/25/1998	< 1	< 1	
MW8	4/14/1998	< 1	< 1	
MW9D	3/11/1998	< 1	1	
MW9D	4/15/1998	< 1	< 1	
MW9S	3/12/1998	2.5	2	
MW9S	4/15/1998	2.2	0.9	

TABLE 2.1 (Cont.)

Reported Sampling Location	Sample Date	Concentration (µg/L)		Notes on Result/Source
		Carbon Tetrachloride	Chloroform	
<i>Results of sampling in selected monitoring wells (1999-2005)</i>				
MW2	1/15/1999	123	NR	
MW4P	1/15/1999	35.7	NR	
MW4S	1/15/1999	231	NR	
MW4D	1/15/1999	ND	NR	
MW2	4/19/2001	75.8	NR	
MW4P	4/19/2001	49.9	NR	
MW4S	4/19/2001	198	NR	
MW9S	4/19/2001	8.6	NR	
MW9D	4/19/2001	ND	NR	
MW2	4/24/2002	90.7	NR	
MW4P	4/24/2002	86.3	NR	
MW5	4/24/2002	ND	NR	
MW9S	4/24/2002	9.1	NR	
MW9D	4/24/2002	ND	NR	
MW2	6/13/2003	82	NR	
MW4P	6/12/2003	73	NR	
MW4S	6/12/2003	180	NR	
MW4D	6/13/2003	83	NR	
MW5	6/12/2003	ND	NR	
MW9S	6/12/2003	11	NR	
MW9D	6/12/2003	ND	NR	
MW2	5/17/2005	160	NR	
MW4P	5/17/2005	ND	NR	
MW4S	5/17/2005	160	NR	
MW5	5/17/2005	ND	NR	
MW9S	5/17/2005	12	NR	
MW9D	5/17/2005	ND	NR	
MW4P	6/10/2009	160	NR	
MW4S	6/10/2009	0.85	NR	
MW4D	6/10/2009	ND	NR	
MW4D	6/10/09 dup	ND	NR	
<i>Results from the KDHE supplemental site investigation (2009-2010)^d</i>				
GW01S	12/22/09	100/67	5.2/3.4	74-79 ft BGL
GW02S	12/22/09	240/190	6.2/4.5	69.5-74.5 ft BGL
GW03S	12/22/09	3.5/2.5	ND/0.3 J ^e	54-58 ft BGL
GW04S	Dry	Dry	Dry	54-58 ft BGL
GW05P	12/17/09	ND/ND	ND/ND	11-15 ft BGL
GW05S	12/17/09	91/110	3/2.7	53-57 ft BGL
GW06S	1/5/10	39/50	1.9/1.8	65-69 ft BGL
GW07S	1/5/10	190/244	2.5/2.6	63-67 ft BGL
GW08S	12/18/09	20/16	1.4/1.0	57-61 ft BGL
GW09S	12/21/09	ND/ND	ND/ND	56-61 ft BGL
GW10S	12/21/09	ND/ND	ND/0.3 J	60-65 ft BGL

TABLE 2.1 (Cont.)

^a NR, not reported.

^b Data available in the KDHE Kansas Drinking Water Watch online database.

^c ND, not detected.

^d Results of analyses by KDHE/AGEM Laboratory.

^e J , estimated concentration below the AGEM Laboratory quantitation limit of 1.0 µg/L for this compound.

TABLE 2.2 Analytical results for soil gas samples collected by the KDHE on November 5, 1987.^a

Location	Sample Depth (ft BGL)	Concentration (ppbv)				
		CCl ₄	TCA	TCE	Toluene	THC
SG1	4	0.0008	0.002	0.02	4	4
SG2	6	0.00008	0.0008	0.002	< 0.05	< 0.05
SG3	5	0.01	0.001	0.008	< 0.05	< 0.05
SG4	4	0.2	0.001	0.02	< 0.05	< 0.05
SG5	3	0.0002	0.002	0.004	< 0.05	< 0.05
SG6	6	0.0002	0.03	0.05	< 0.05	< 0.05
SG7	4	0.0002	0.002	0.002	< 0.05	< 0.05
SG8	5	0.003	0.001	0.002	< 0.05	< 0.05
SG9	6	0.0005	0.004	0.005	0.3	0.8
SG10	5	0.0003	0.002	0.0008	0.2	0.8
SG11	6	< 0.00002	0.002	0.003	< 0.05	< 0.05
SG12	4	0.0004	0.002	0.003	0.2	2

^a Abbreviations:
ppbv, parts per billion by volume
BGL, below ground level
CCl₄, carbon tetrachloride
TCA, 1,1,1-trichloroethane
TCE, trichloroethylene
THC, total hydrocarbons

TABLE 2.3 Construction data for permanent monitoring wells.

Well	Year Installed	Screen Length ^a (ft)	Depth (ft BGL)			Reference Elevation ^b (ft AMSL)
			Total ^a	Screen Interval ^a	Filter Pack Interval ^a	
MW1 ^c	1988	15	99	84-99	26-99	1130.18
MW2 ^c	1988	15	99.55	84.55-99.55	25-99.55	1110.69
MW3 ^c	1988	10	71.4	61.4-71.4	25-71.4	1086.85
MW4P	1998	10	30	20-30	18.3	1123.17
MW4S	1998	20	82	60-80	58-82	1123.23
MW4D	1998	15	140	111-126	108.5-129	1123.23
MW5	1998	15	140	115-130	110-133	1124.56
MW6	1998	15	135	115-130	111-135	1108.85
MW7	1998	15	140	123.138	120-140	1116.31
MW8	1998	15	122	106.121	100-122	1089.59
MW9S	1998	20	65	45-65	42-65	1107.64
MW9D	1998	15	138	105-120	102-123	1107.34
MW10P	2012	10	25.4	15.1-25.1	13-25.4	NR ^d
MW10S	2012	20	65.4	44.85-64.85	48-65.4	NR

^a Data are as reported in KDHE WWC-5 registration forms.

^b Elevations for wells MW1-MW9 are as reported in comprehensive investigation (KDHE 1998).

^c Wells MW1-MW3 were plugged and abandoned by the KDHE in 2006.

^d NR, data not recorded.

TABLE 2.4 Analytical results for VOCs in vertical-profile soil samples collected at location MW4D in March 1998.

Sample Depth (ft BGL)	Sample Date	Concentration ^a (µg/kg)			
		Carbon Tetrachloride	Chloroform	Methylene Chloride ^b	Tetrachloroethene
1-3	3/2/98	< 6.4	< 6.4	< 6.4	< 6.4
5-7	3/2/98	< 6.6	< 6.6	< 6.6	< 6.6
10-12	3/2/98	< 6.6	< 6.6	2 J	< 6.6
15-17	3/2/98	< 6.6	< 6.6	2.1	< 6.6
20-22	3/2/98	< 6.3	< 6.3	< 6.3	< 6.3
25-27	3/2/98	3.5	< 6.2	< 6.2	< 6.2
30-32	3/2/98	< 6.1	< 6.1	< 6.1	< 6.1
35-37	3/2/98	< 6.3	< 6.3	< 6.3	< 6.3
40-42	3/2/98	< 6.3	< 6.3	< 6.3	< 6.3
45-47	3/2/98	< 6.3	< 6.3	< 6.3	< 6.3
50-52	3/4/98	100	< 6.2	10	< 6.2
55-57	3/4/98	< 6.3	< 6.3	12	< 6.3
60-62	3/4/98	7	< 6.3	11	1.9
65-67	3/4/98	3.2	< 6.1	11	< 6.1

^a Data are as reported by the KDHE (1998).

^b Methylene chloride was detected in the method blank associated with analysis of the samples.

TABLE 2.5 Analytical results for VOCs in groundwater samples collected by the KDHE from private wells in February 2013.^a

Reported Sampling Location	Sample Date	Concentration (µg/L)			Notes on Result/Source
		Carbon Tetrachloride	Chloroform	Methylene Chloride	
Albers	2/13/13	4.4	ND	ND	–
B. Dickson	2/14/13	ND	1.1	ND	One Dickson well in work plan.
R. Dickson	2/14/13	ND	ND	ND	One Dickson well in work plan.
D. Rush	2/13/13	ND	ND	ND	–
Johnson	2/13/13	ND	ND	ND	Two Johnson wells in work plan.
L. Rush	2/13/13	ND	ND	ND	Name not in work plan.
Staudenmaier	2/13/13	ND	ND	ND	Two Staudenmaier wells in work plan.
Thompson	2/13/13	ND	ND	ND	Name not in work plan.

^a Data are as provided to Argonne by the CCC/USDA (2013).

TABLE 2.6 Summary of groundwater level measurements for the permanent monitoring wells and well PWS1.

Well	Reference (TOC ^a) Elevation (ft AMSL)	Reference Elevation Source ^b	Measurement Date	Measured Depth to Water (ft TOC) ^a	Calculated Water Level Elevation (ft AMSL)	Measured Water Level Source ^b
MW1 ^c	1130.18	SI, CI	4/20/88	62.40	1067.78	SI
			8/17/88	83.30	1046.88	SI
			4/13/98	57.36	1072.82	CI
			4/13/98	57.48	1072.70	CI
MW2 ^c	1110.69	SI, CI	4/20/88	39.90	1070.79	SI
			5/18/88	50.65	1060.04	SSI
			8/17/88	51.00	1059.69	SI
			11/18/97	50.96	1059.73	SSI
			4/13/98	44.52	1066.17	CI
			4/15/98	44.14	1066.55	CI
			4/24/02	53.58	1057.11	SSI
			5/17/05	54.00	1056.69	SSI
MW3 ^c	1085.37	SI	4/8/88	25.00	1060.37	SSI
			4/20/88	25.00	1060.37	SI
			8/17/88	27.85	1057.52	SI
	1086.85	CI	3/20/98	21.46	1065.39	CI
			3/31/98	20.84	1066.01	CI
			4/13/98	18.32	1068.53	CI
			4/13/98	18.33	1068.52	CI
MW4D	1123.23	CI	3/20/98	65.32	1057.91	CI
			3/31/98	63.36	1059.87	CI
			4/13/98	61.68	1061.55	CI
			4/15/98	61.57	1061.66	CI
			6/10/09	59.20	1064.03	SSI
			7/17/12	69.80	1053.43	JF2
MW4S	1123.23	CI	3/20/98	46.90	1076.33	CI
			3/31/98	44.32	1078.91	CI
			4/13/98	42.42	1080.81	CI
			4/15/98	41.75	1081.48	CI
			5/17/05	58.36	1064.87	SSI
			5/23/06	59.51	1063.72	SSI
			5/30/07	43.30	1079.93	SSI
			7/8/08	40.22	1083.01	SSI
			6/10/09	38.48	1084.75	SSI
			7/17/12	45.47	1077.76	JF2
MW4P	1123.17	CI	3/20/98	13.63	1109.54	CI
			3/31/98	9.92	1113.25	CI
			4/13/98	10.65	1112.52	CI
			4/15/98	10.81	1112.36	CI
			4/24/02	19.70	1103.47	SSI
			5/17/05	14.10	1109.07	SSI
			5/23/06	15.76	1107.41	SSI
			5/30/07	11.45	1111.72	SSI
			7/8/08	14.92	1108.25	SSI
			6/10/09	12.36	1110.81	SSI
7/17/12	19.30	1103.87	JF2			

TABLE 2.6 (Cont.)

Well	Reference (TOC ^a) Elevation (ft AMSL)	Reference Elevation Source ^b	Measurement Date	Measured Depth to Water (ft TOC) ^a	Calculated Water Level Elevation (ft AMSL)	Measured Water Level Source ^b
MW5	1124.56	CI	3/20/98	66.56	1058.00	CI
			3/31/98	64.80	1059.76	CI
			4/13/98	63.15	1061.41	CI
			4/13-15/98	62.99	1061.57	CI
			4/24/02	71.29	1053.27	SSI
			5/17/05	68.41	1056.15	SSI
			5/23/06	69.63	1054.93	SSI
			5/24/07	60.57	1063.99	SSI
			7/8/08	68.20	1056.36	SSI
			6/10/09	60.72	1063.84	SSI
			7/17/12	66.15	1058.41	JF2
MW6	1108.85	CI	3/20/98	51.09	1057.76	CI
			3/31/98	49.32	1059.53	CI
			4/13/98	47.77	1061.08	CI
			4/13/98	47.14	1061.71	CI
			8/18/09	47.66	1061.19	SSI
MW7	1116.31	CI	3/20/98	59.15	1057.16	CI
			3/31/98	57.33	1058.98	CI
			4/13/98	55.59	1060.72	CI
			4/13/98	55.51	1060.80	CI
			8/18/09	55.40	1060.91	SSI
MW8	1089.59	CI	3/20/98	32.24	1057.35	CI
			3/31/98	30.35	1059.24	CI
			4/13/98	28.98	1060.61	CI
			4/13/98	28.46	1061.13	CI
			8/18/09	28.66	1060.93	SSI
MW9D	1107.34	CI	3/20/98	49.68	1057.66	CI
			3/31/98	47.82	1059.52	CI
			4/13/98	46.14	1061.20	CI
			4/15/98	45.97	1061.37	CI
			4/24/02	53.37	1053.97	SSI
			5/17/05	52.85	1054.49	SSI
			5/23/06	66.60	1040.74	SSI
			5/30/07	43.95	1063.39	SSI
			7/8/08	43.19	1064.15	SSI
6/10/09	42.88	1064.46	SSI			
MW9S	1107.64	CI	3/20/98	32.89	1074.75	CI
			3/31/98	29.61	1078.03	CI
			4/13/98	27.97	1079.67	CI
			4/15/98	27.02	1080.62	CI
			4/24/02	39.70	1067.94	SSI
			5/17/05	41.00	1066.64	SSI
			5/23/06	31.55	1076.09	SSI
			5/30/07	27.65	1079.99	SSI
			7/8/08	27.20	1080.44	SSI
6/10/09	24.91	1082.73	SSI			

TABLE 2.6 (Cont.)

Well	Reference (TOC ^a) Elevation (ft AMSL)	Reference Elevation Source ^b	Measurement Date	Measured Depth to Water (ft TOC) ^a	Calculated Water Level Elevation (ft AMSL)	Measured Water Level Source ^b
MW10S	Not determined	–	7/17/12	52.75	–	JF2
MW10P	Not determined	–	7/17/12	Dry	–	JF2
PWS1	1111.41	CI	4/20/88	47.00	1064.41	SI
			8/17/88	48.35	1063.06	SI

^a TOC, top of casing.

^b Sources:

SI, KDHE site inspection (KDHE 1988)

CI, KDHE comprehensive investigation (KDHE 1998)

SSI, KDHE supplemental site investigation (KDHE 2010)

JF2, Johnson Farms Phase II comprehensive investigation (Larsen 2012b)

^c Wells MW-1, MW-2, and MW-3 were abandoned by the KDHE in early 2006.

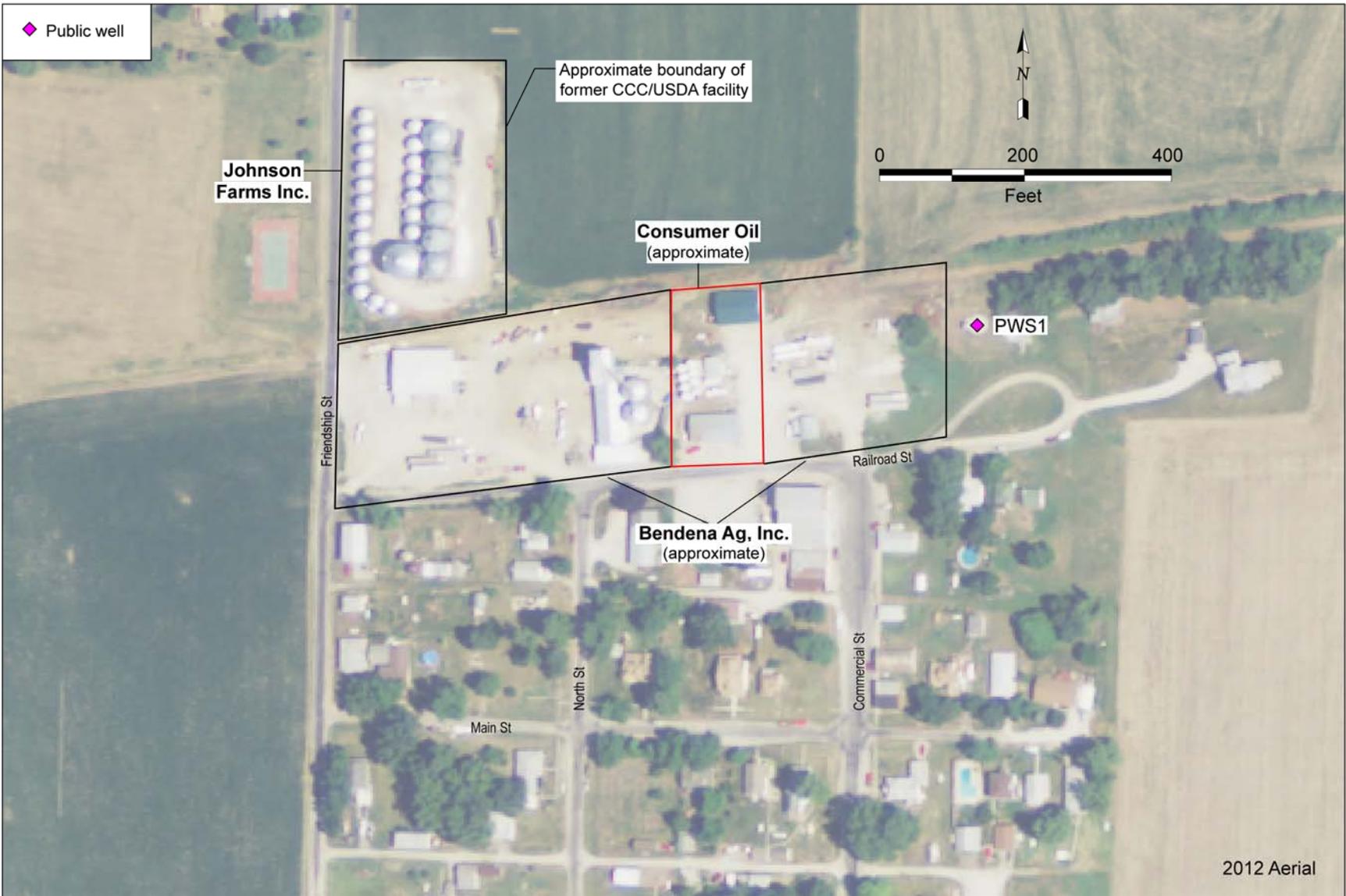


FIGURE 2.1 Locations and current ownership of properties of interest in the investigation, with well PWS1. Source of photograph: NAIP (2012).



FIGURE 2.2 Locations of grain storage facilities in 1966. Source of photograph: USDA (1966).



FIGURE 2.3 Locations of grain storage facilities in 1991. Source of photograph: USGS (1991).

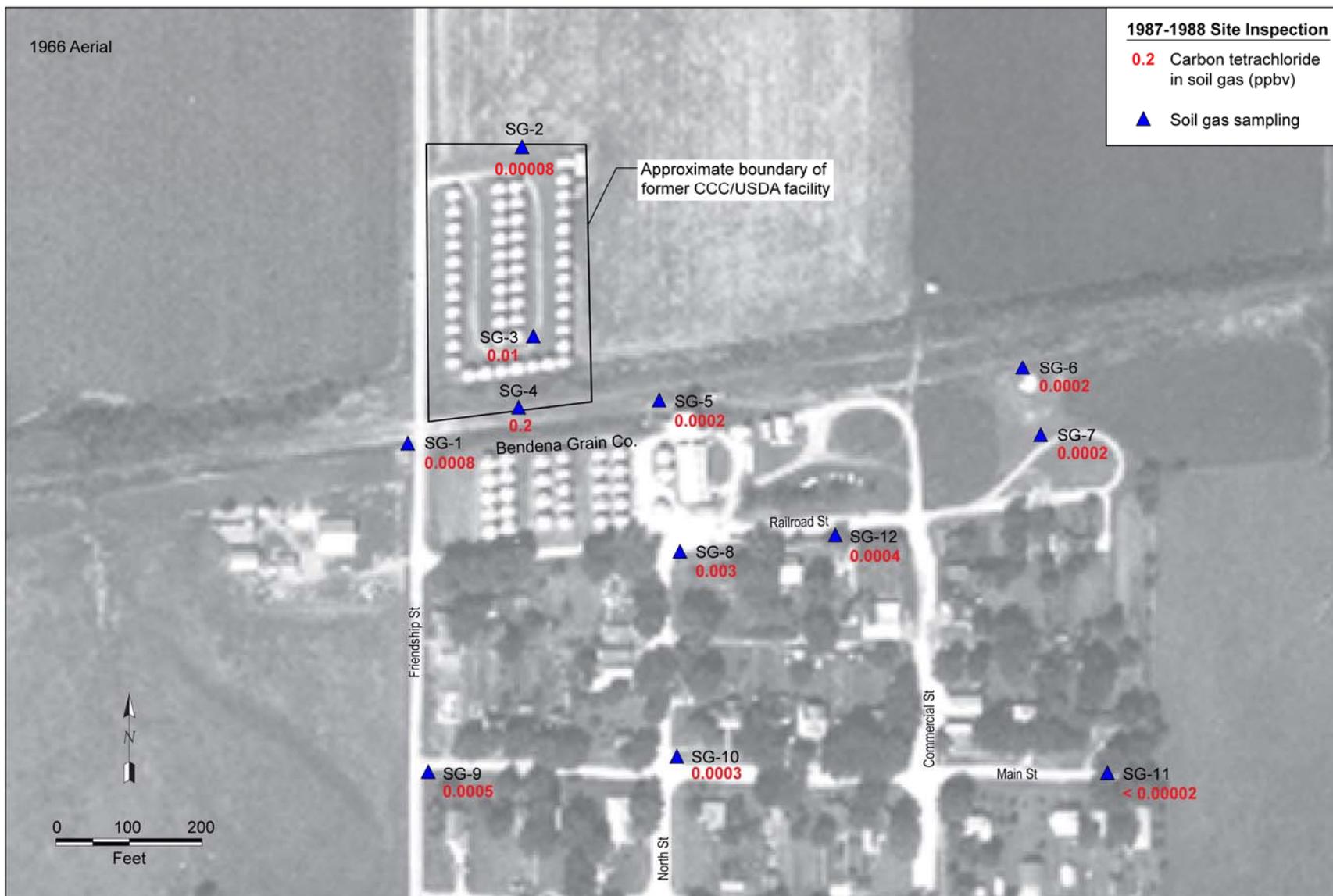


FIGURE 2.4 Sampling locations and results of analyses for carbon tetrachloride in soil gas samples collected during the 1987-1988 KDHE site inspection. Source of photograph: USDA (1966).

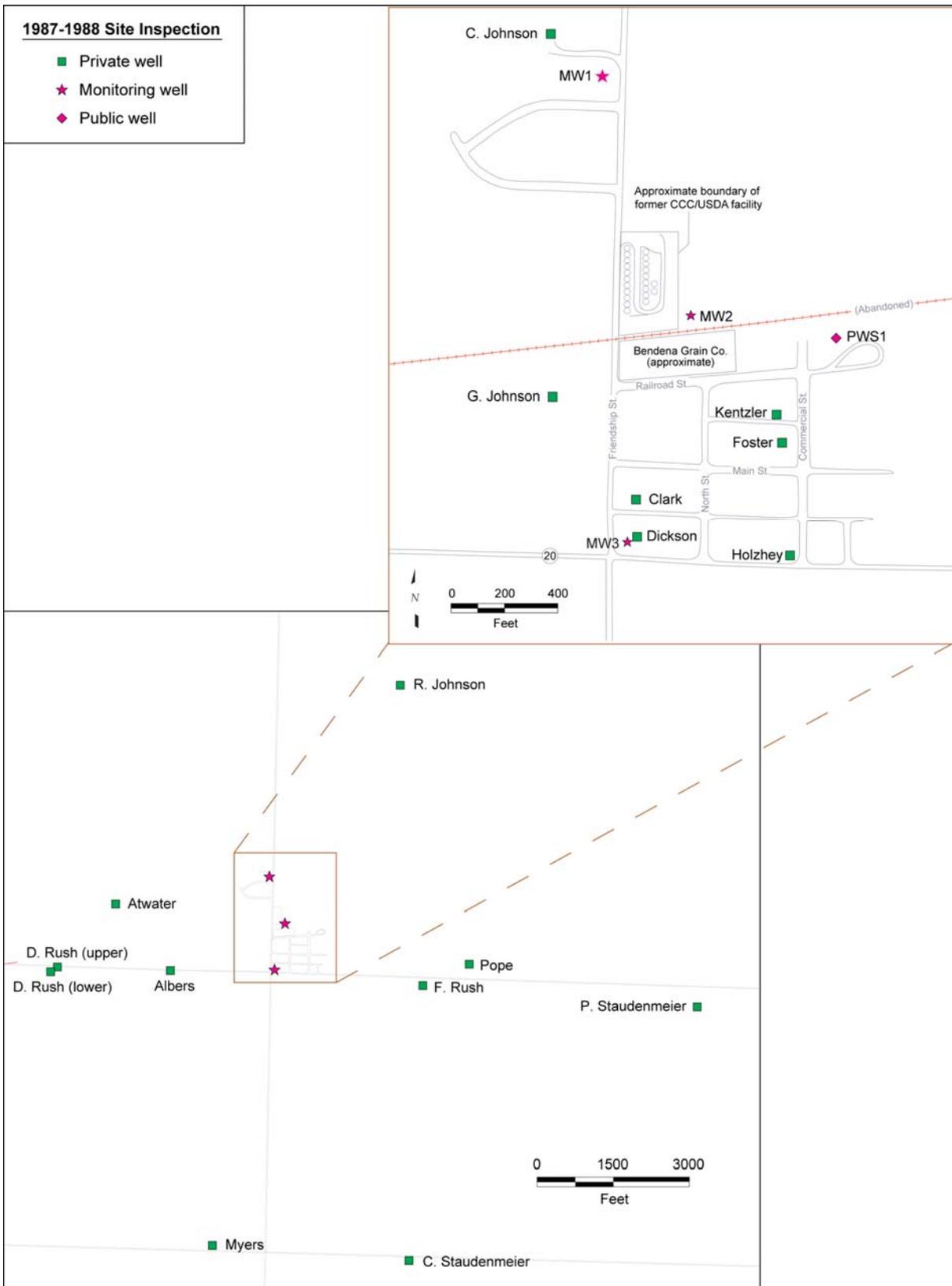


FIGURE 2.5 Locations of monitoring wells MW1-MW3 and private wells investigated during the 1987-1988 KDHE site inspection.

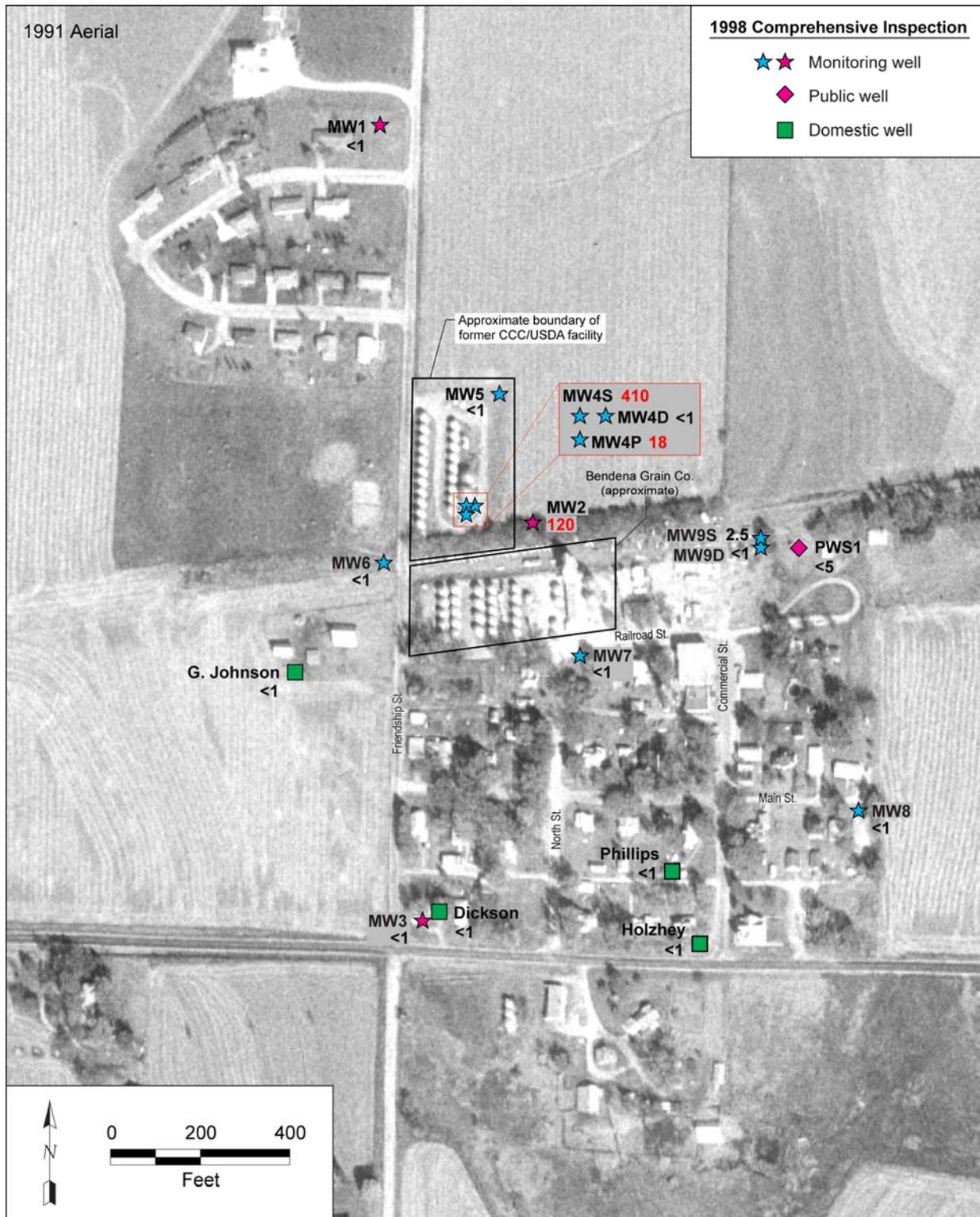


FIGURE 2.6 Sampling locations during the 1998 KDHE comprehensive investigation. Source of photograph: USGS (1991).

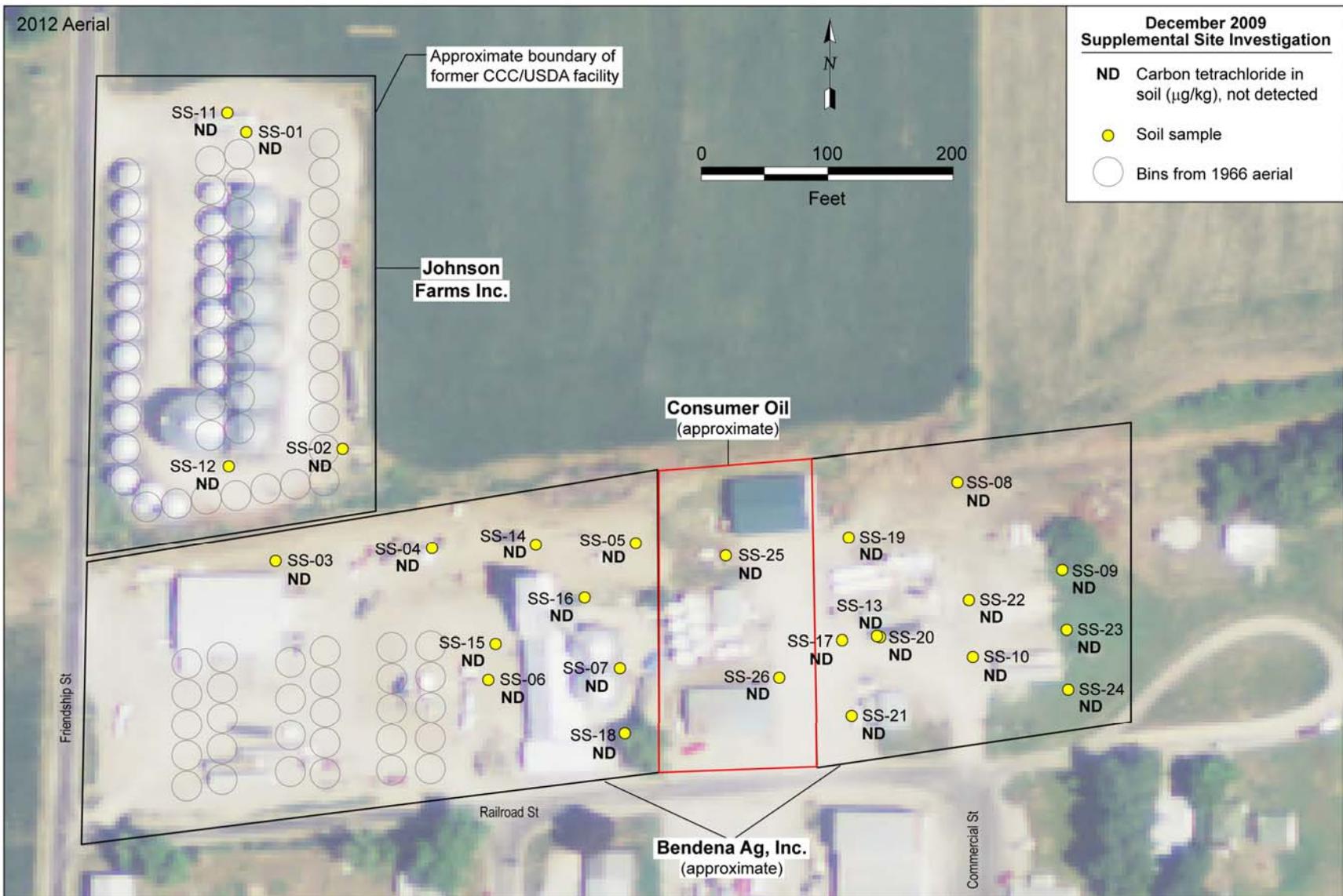


FIGURE 2.7 Shallow soil sampling locations in the 2009-2010 KDHE supplemental site investigation, with carbon tetrachloride results for the Argonne split soil samples. Source of photograph: NAIP (2012).

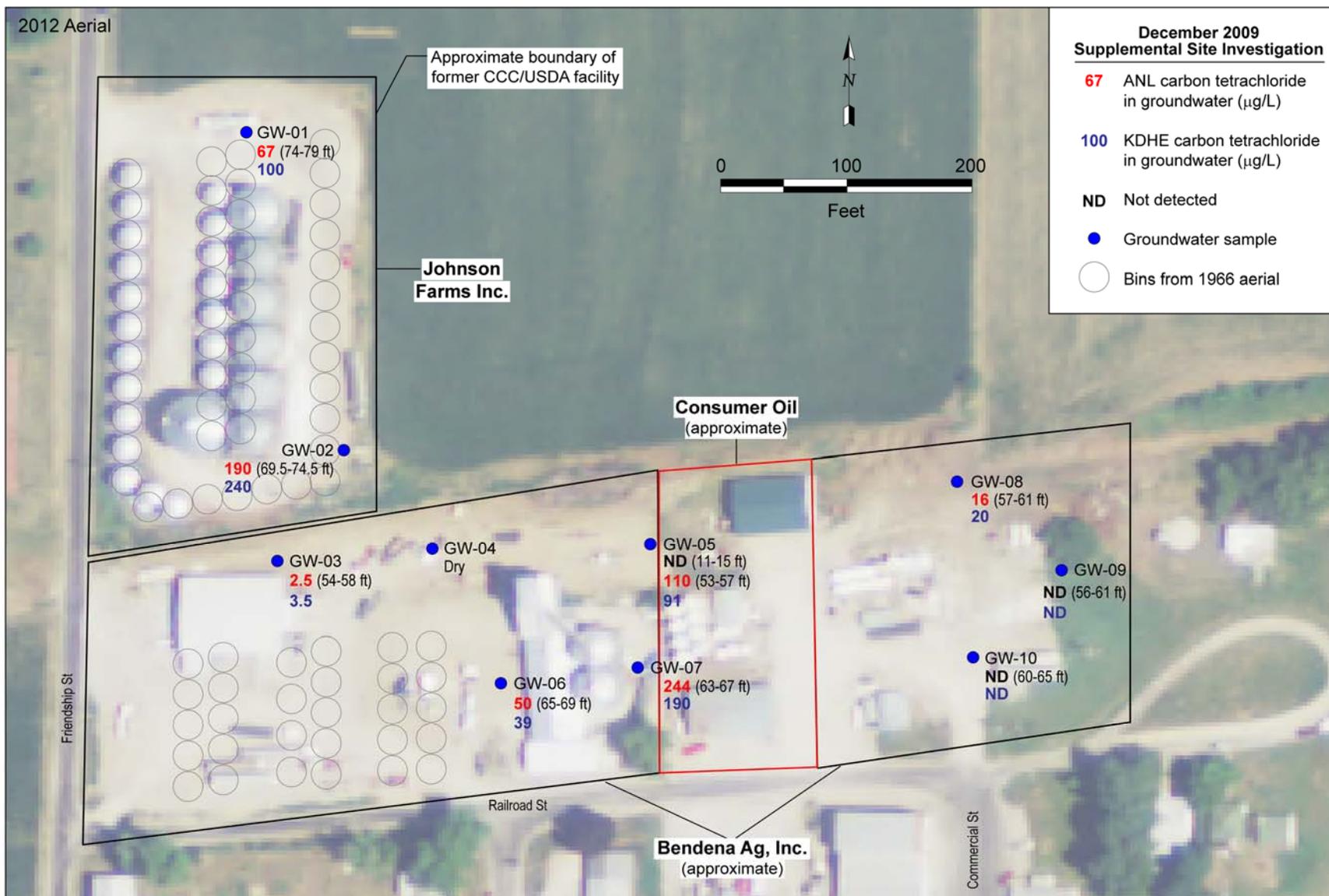


FIGURE 2.8 Groundwater sampling locations in the 2009-2010 KDHE supplemental site investigation, with carbon tetrachloride results for the KDHE and Argonne split groundwater samples. Source of photograph: NAIP (2012).

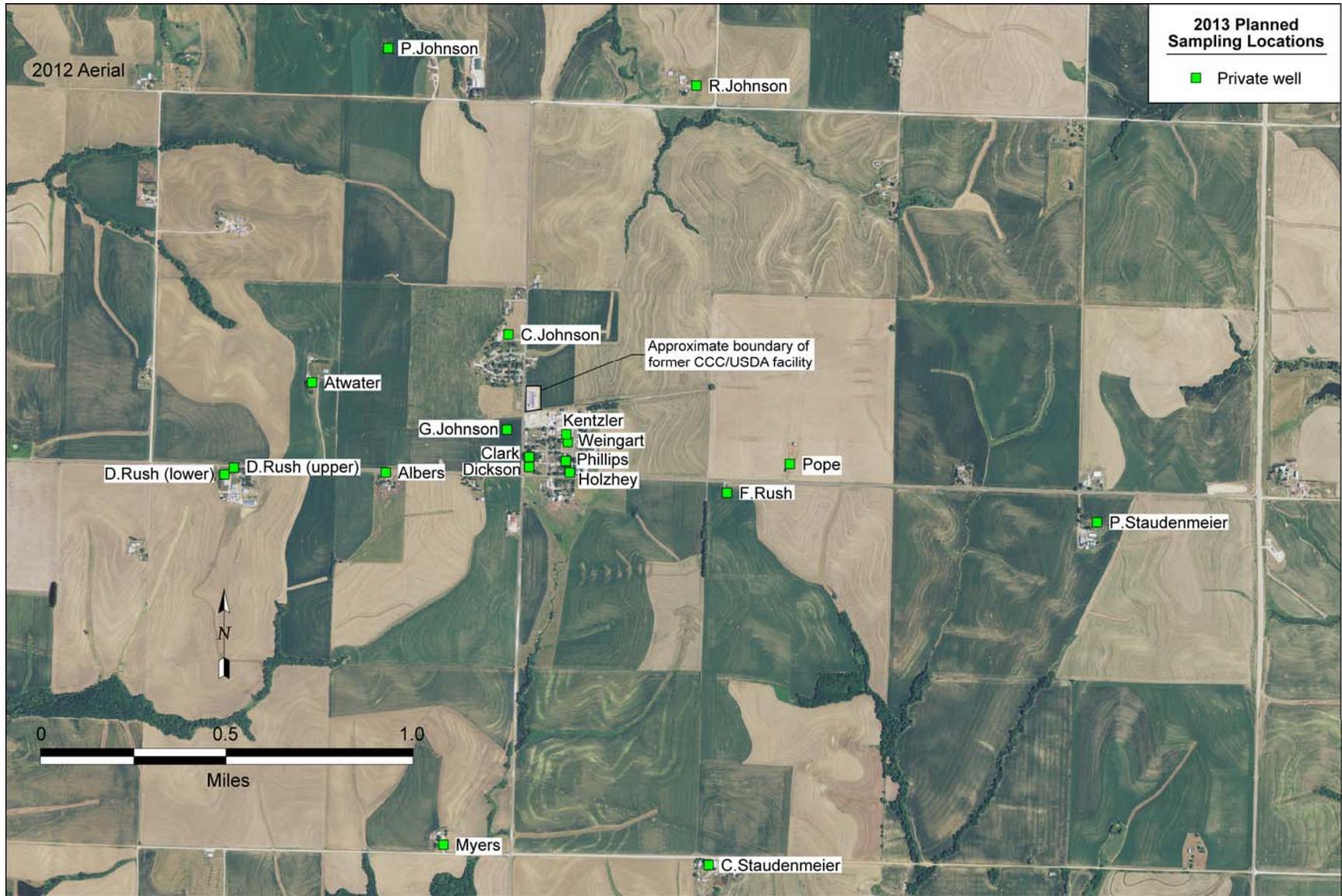


FIGURE 2.9 Locations of private wells proposed for sampling by the KDHE in 2013. Source of photograph: NAIP (2012).

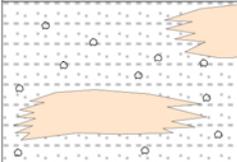
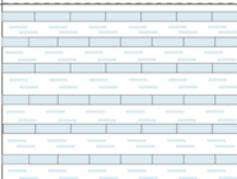
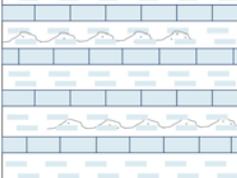
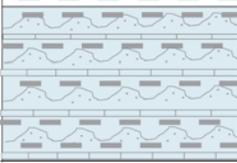
Epoch	Stratigraphy	Formation or Group	Thickness	Physical Character
Pleistocene		Alluvium and Terrace Deposits	0 - 120 ft.	Clay, silt, sand, and gravel in principal stream valleys. Coarser materials generally in lower portions of the deposits.
		Peoria, Gilman Canyon, and Loveland Formations	0 - 150 ft.	Brown to reddish-brown silt and silty clay loess. Generally 10 to 30 ft. thick on uplands. Thickness locally exceeds 100 ft. along banks of the Missouri river.
		Independence Formation (Till and outwash deposits)	0 - 150 ft.	Gray, blue-gray or brown terrigenous clay, containing wood fragments, occasional to abundant limestone, quartzite and other erratics, and lenses to sheet-like bodies of stratified silt, sand and gravel. Abundance of sheet-like bodies increases in southwestern portion of the county.
Pennsylvanian		Wabaunsee Group	0 - 350 ft.	Alternating thin beds of limestone and shale. Contains some sandy shale and sandstone.
		Shawnee Group	0 - 320 ft.	Interbedded thick limestones and shales. Shale contains some sandstone beds.
		Douglas Group	0 - 250 ft.	Shale, containing thick channel sandstones and thin limestones.

FIGURE 2.10 Generalized stratigraphic column for the Doniphan County area.

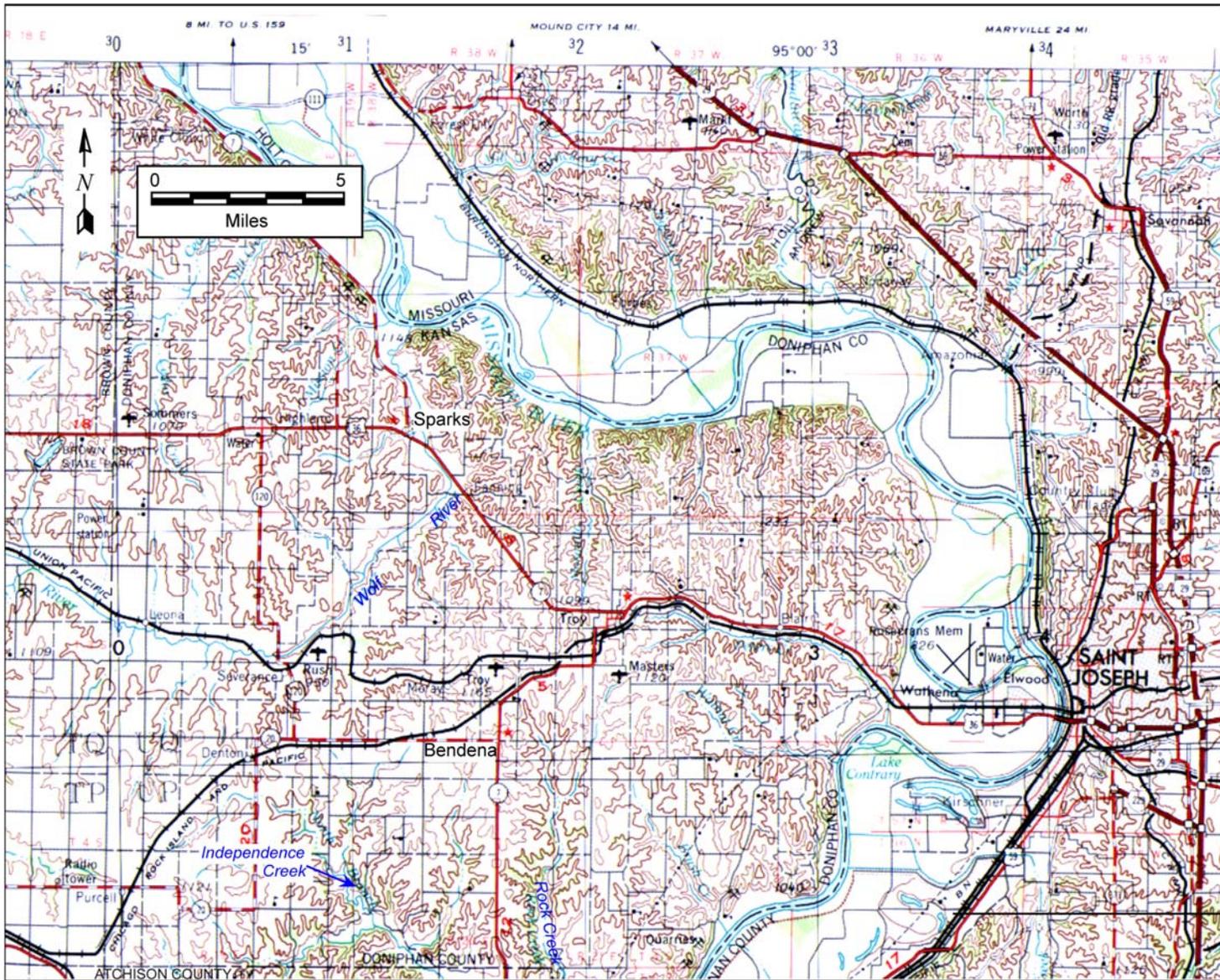


FIGURE 2.11 Modern topography of the Doniphan County Area. Source of map: USGS (1969).

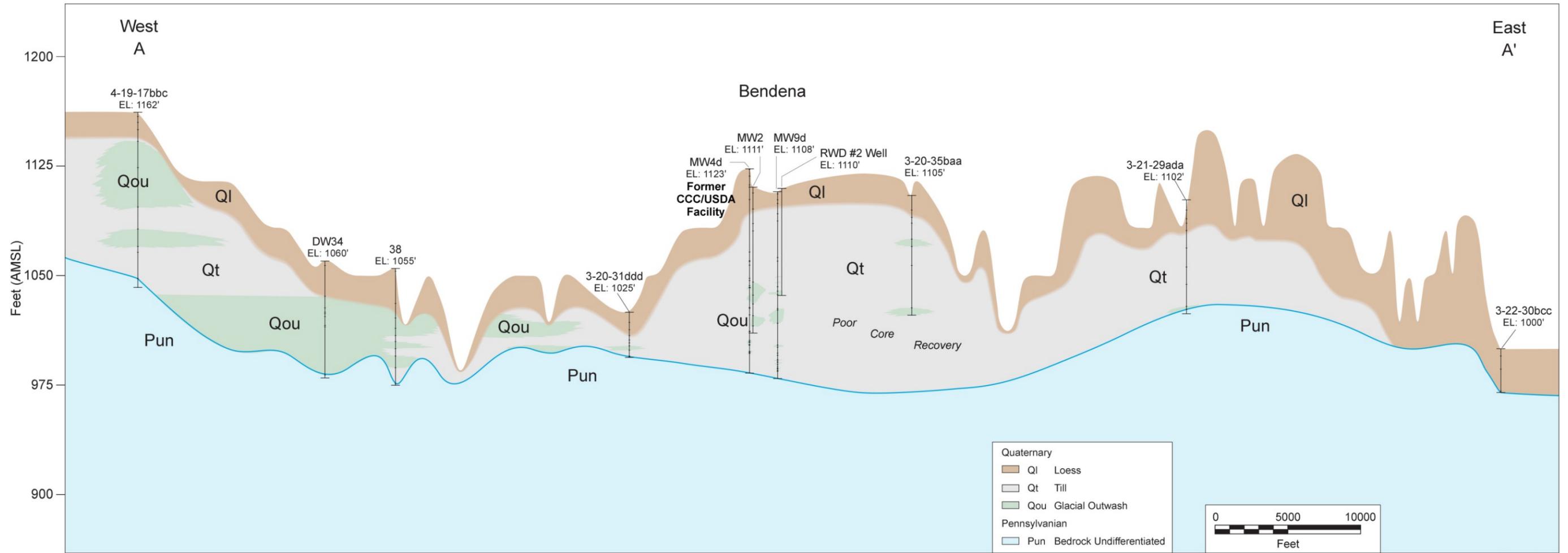


FIGURE 2.12 West-to-east geologic cross section A-A' (vertically exaggerated) across Doniphan County and through Bendena, at the location shown in Figure 2.13.

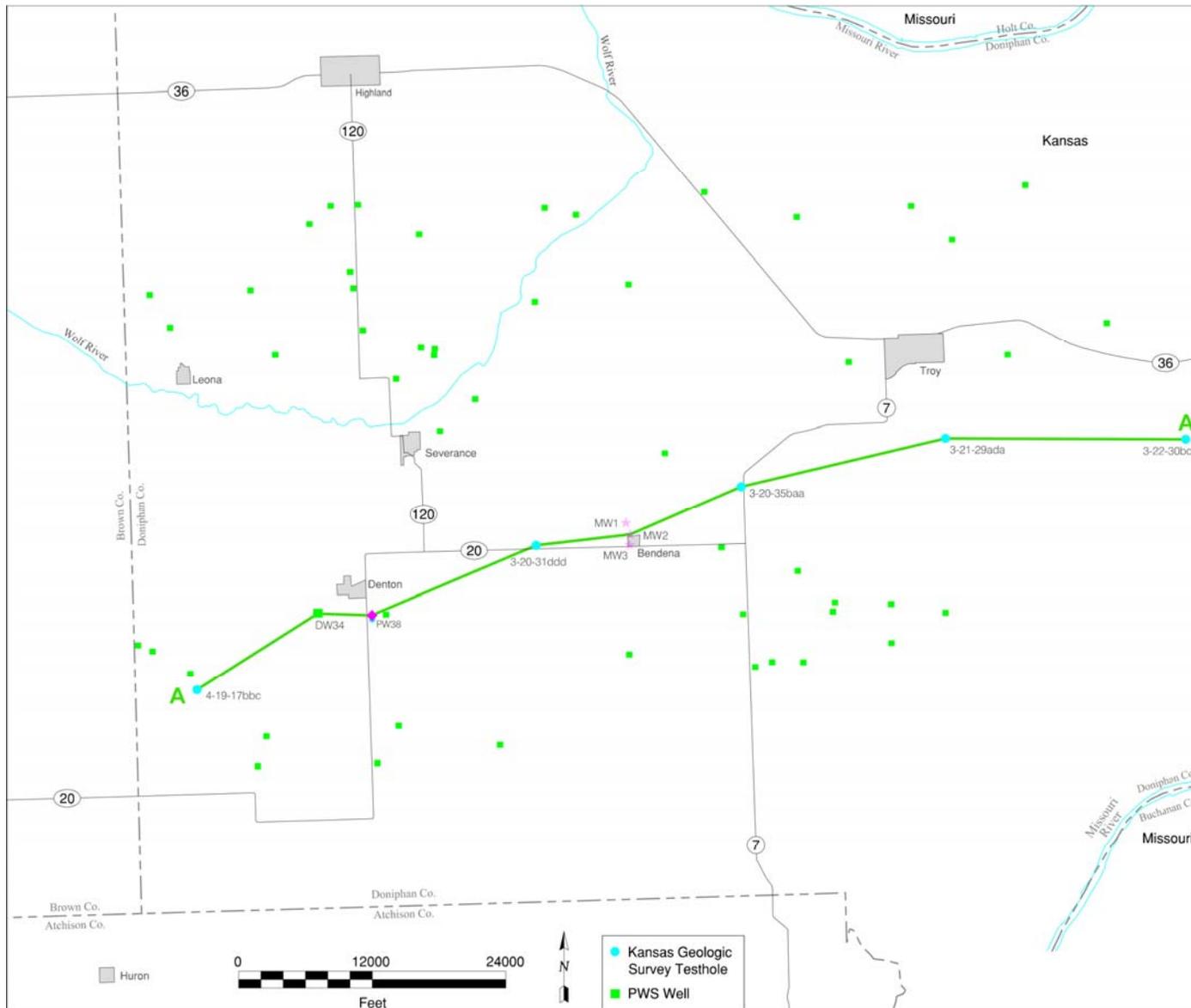


FIGURE 2.13 Location of west-to-east geologic cross section A-A' across Doniphan County.

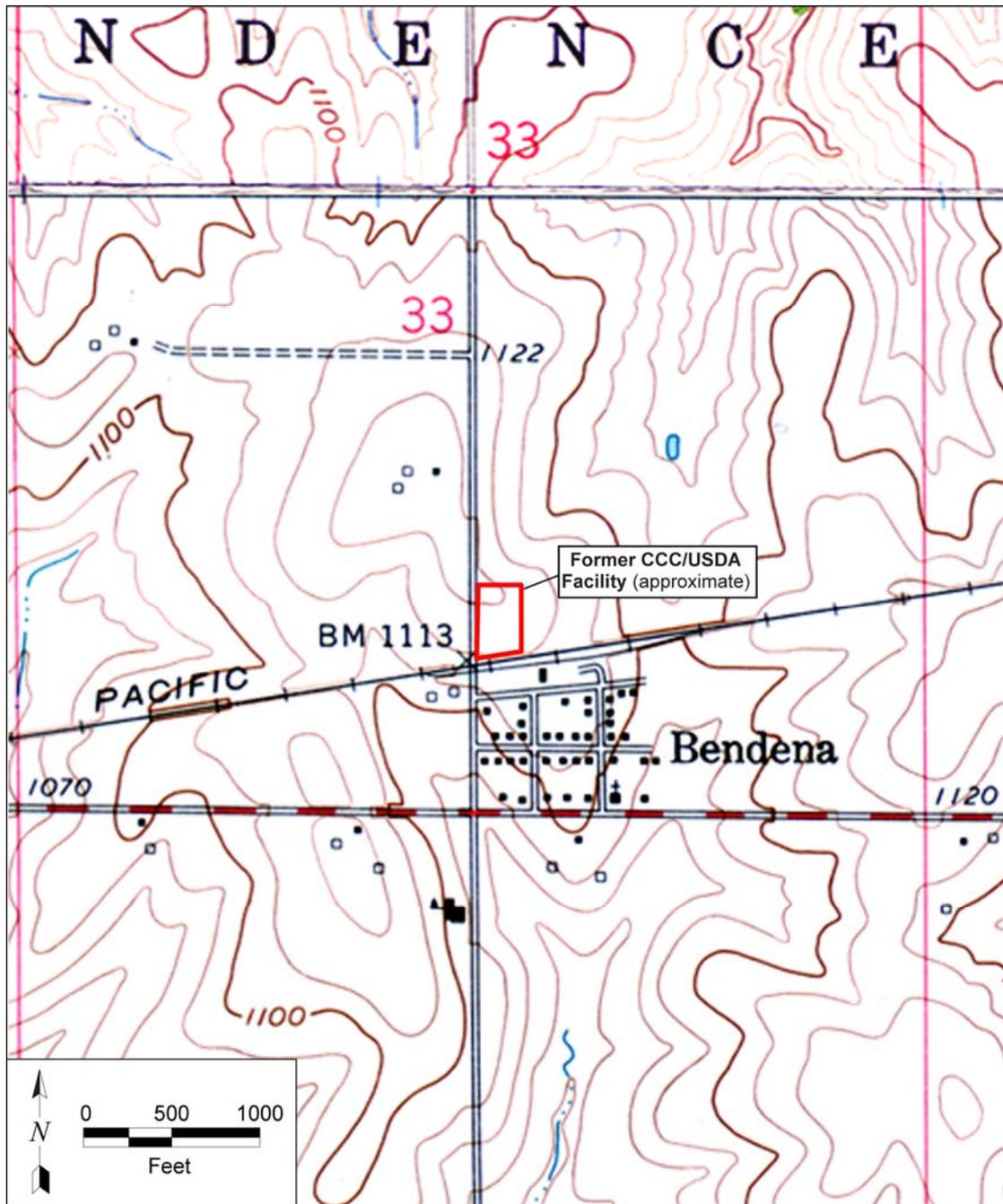


FIGURE 2.14 Local topography of the Bendena area. Source of map: USGS (1969).

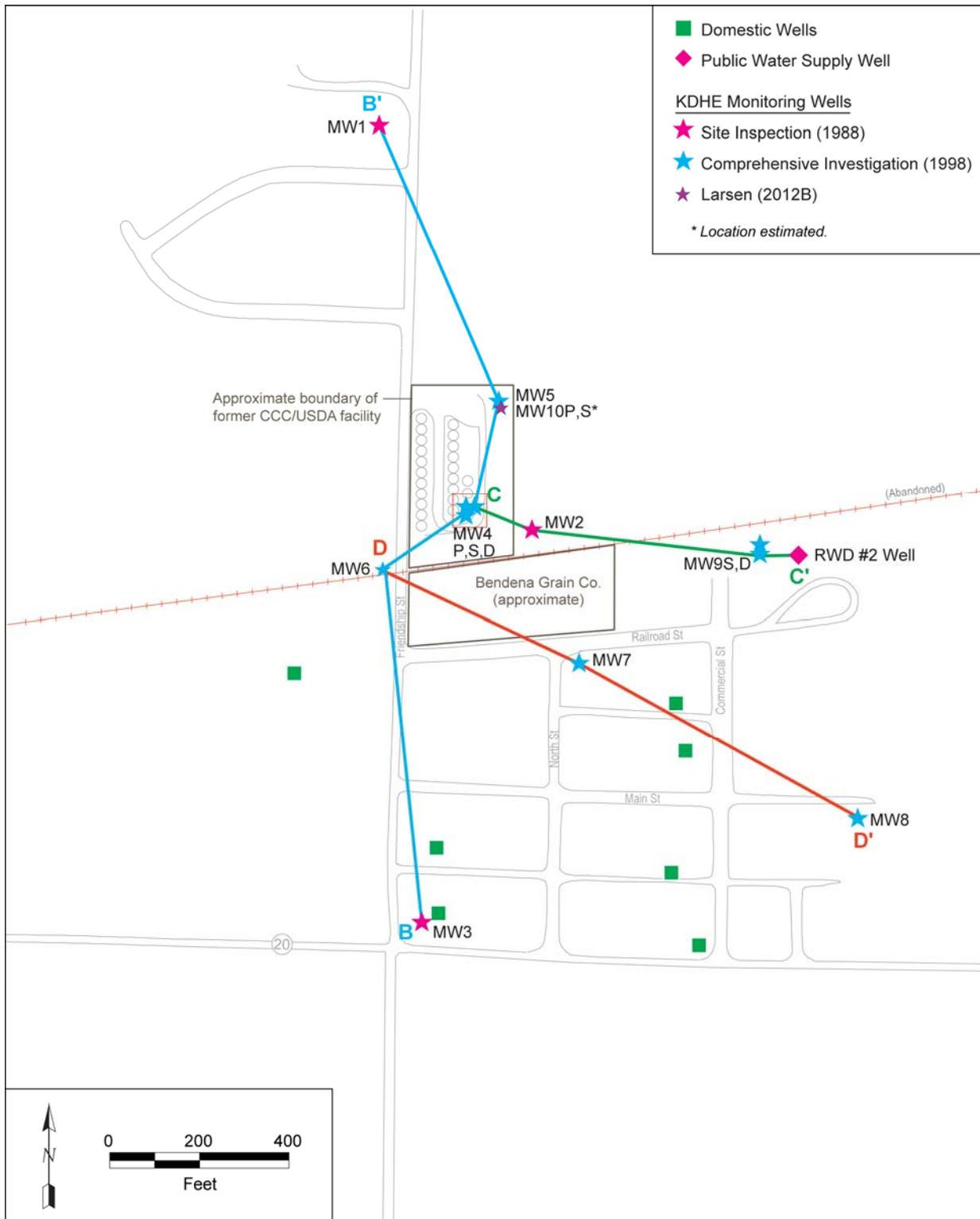


FIGURE 2.15 Locations of hydrogeologic cross sections B-B', C-C', and D-D' at Bendena, with public water supply, domestic, and monitoring wells.

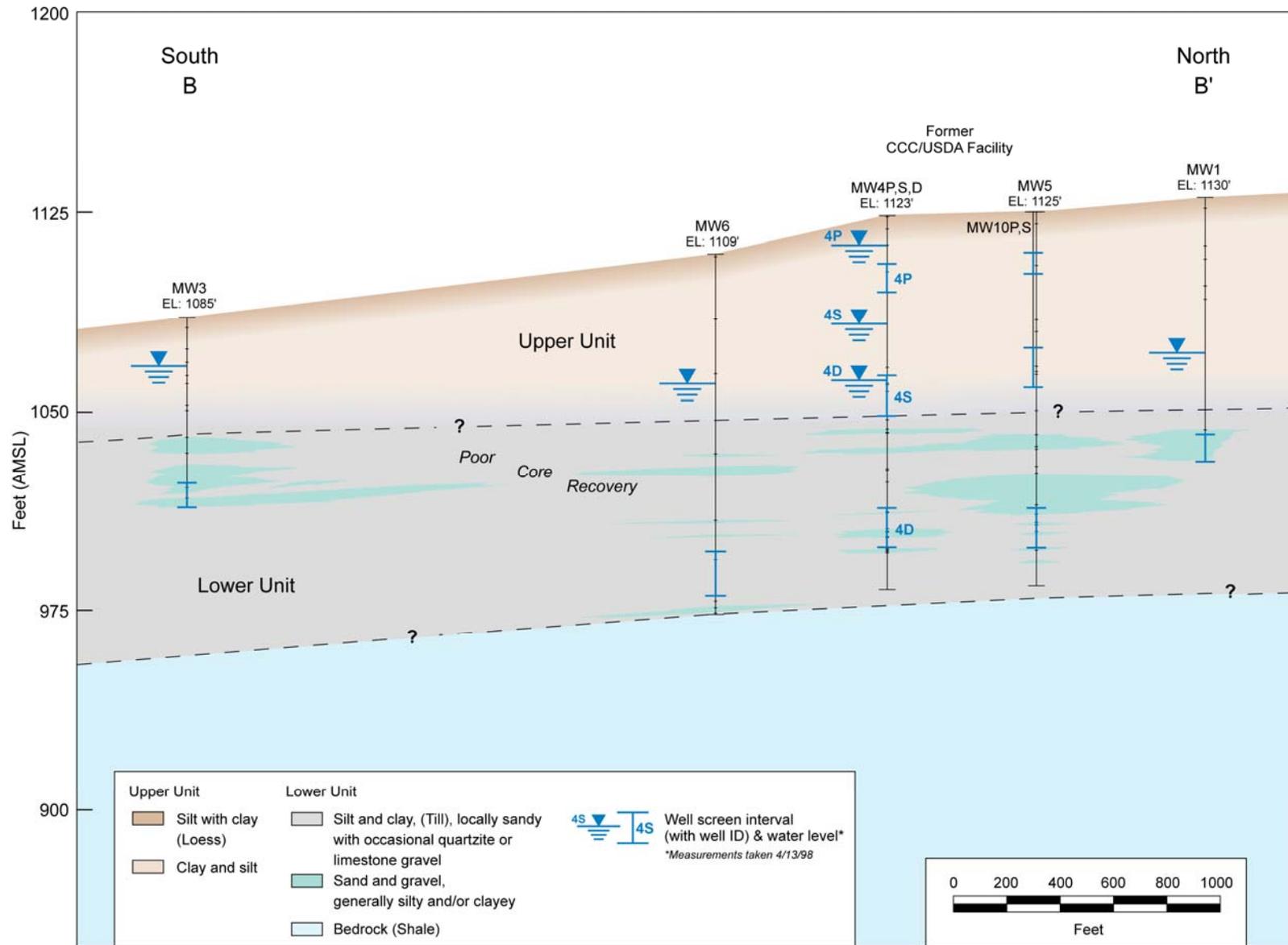


FIGURE 2.16 South-to north hydrogeologic cross section B-B' (vertically exaggerated) at Bendena.

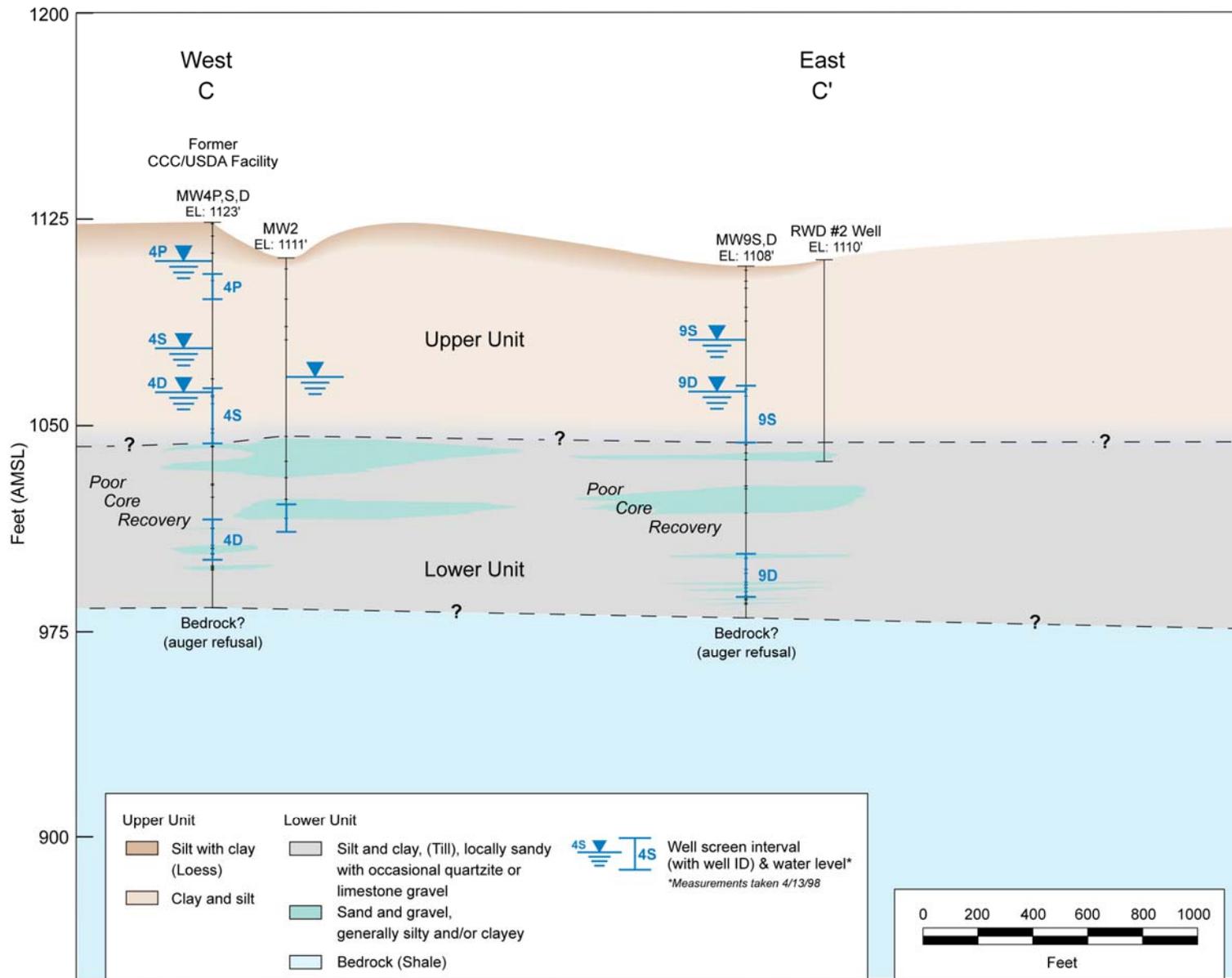


FIGURE 2.17 West-to-east hydrogeologic cross section C-C' (vertically exaggerated) at Bendena.

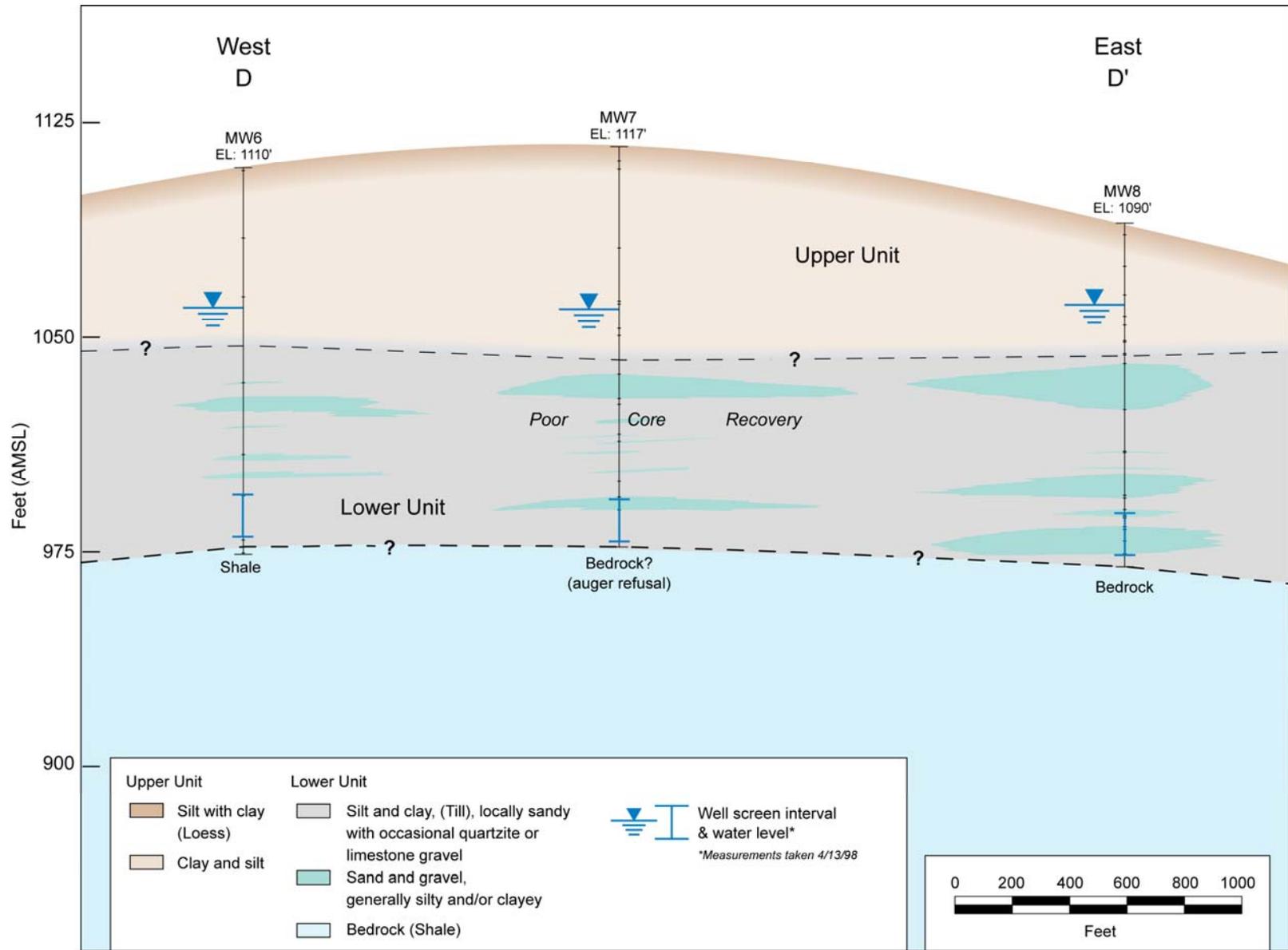


FIGURE 2.18 West-to-east hydrogeologic cross section D-D' (vertically exaggerated) at Bendena.



FIGURE 2.19 Mechanically contoured potentiometric surface for water levels measured in 1998 in the lower aquifer monitoring wells, including MW7. Source of photograph: NAIP (2012).

3 Proposed Technical Program for the Investigation

The technical program presented in this section outlines the initial stage of the investigations to be conducted by the CCC/USDA at Bendena. The primary goal of this program is to determine the potential relationship between (1) the carbon tetrachloride contamination previously identified in soil and groundwater at the former CCC/USDA grain storage facility and (2) the carbon tetrachloride historically detected in groundwater at well PWS1, several permanent monitoring wells, and several investigative borings in the vicinity of the former CCC/USDA facility. The work at Bendena will be conducted in phases, in consultation with the CCC/USDA and KDHE project managers, so that the technical efforts at each stage of the investigation can be optimized by incorporating the results obtained earlier in the study.

The historical data evaluation summarized in Section 2, together with discussions among the KDHE, the CCC/USDA, and key property owners that affect critical site access at Bendena, provided the context for development of the Phase I technical program. In keeping with these factors, the present study is focused on investigation of (1) the vertical and lateral distribution of carbon tetrachloride and (2) the hydrogeologic factors affecting the movement of the contaminant beneath the former CCC/USDA facility (on property now owned by Johnson Farms, Inc.) and the adjacent properties to the south and southeast presently owned by Bendena Ag and Consumer Oil (Figure 3.1).

3.1 Technical Objectives

To guide this phase of the studies at Bendena, the following specific technical objectives are proposed:

- Investigate the carbon tetrachloride contamination previously identified in soils and groundwater; evaluate the former CCC/USDA facility (on property now owned by Johnson Farms) as a potential source of contamination to the local groundwater.
- Investigate the distribution of carbon tetrachloride contamination in the subsurface beneath the properties currently owned by Bendena Ag and the Consumer Oil Co., south and southeast of the former CCC/USDA facility.

- Verify the lithologic and hydrologic characteristics of the unconsolidated geologic sequence hosting the groundwater flow system in the vicinity of the former CCC/USDA facility.
- Identify and document the patterns of groundwater flow and potential contaminant migration in the local hydrogeologic system.
- Update the inventory and status of local private wells; conduct limited private well sampling as appropriate, subject to access, to identify potential downgradient receptors.

3.2 Primary Investigation Tasks

To achieve these technical objectives, five primary investigation tasks will be addressed in the Phase I field program. The specific activities to be implemented under each task are summarized below. Argonne will review the results of each task as they are received in the field and will consult with the CCC/USDA and KDHE project managers to ensure that the program is meeting the stated technical objectives. To this end, the tasks and investigation locations recommended below, which were selected to accommodate these multiple objectives in a cost- and time-effective manner, will be subject to further review and possible modification (with the consent of the CCC/USDA and KDHE project managers) as the field activities progress.

Each task described addresses a unique element of the investigative program; however, the tasks do not necessarily define a strict sequence of activities. For logistic reasons and for efficiency in the field, components of one or more primary tasks might be implemented or be in progress at any time during the on-site investigation.

3.2.1 Task 1. Conduct Vertical Profiling at the Former CCC/USDA Facility to Determine the Distribution of Carbon Tetrachloride Contamination in Soils and Groundwater

As outlined in Section 2.2, limited previous sampling indicated the presence of carbon tetrachloride contamination in soils and groundwater at the former CCC/USDA facility (now the Johnson Farms property); however, the potential vertical and areal extent of the carbon tetrachloride in these media has not been investigated. To verify these occurrences and provide

more detailed information on the subsurface distribution of the contaminant, soil and groundwater sampling for VOCs analyses will be performed through the vadose and saturated zone(s) at investigative boring locations 1-4 in Figure 3.1. At each of these locations, continuous soil cores will be collected from the ground surface to the top of bedrock, to establish the detailed lithologic and hydrostratigraphic sequence beneath the former CCC/USDA facility.

Groundwater samples will be collected for VOCs analysis from each identified zone of greater permeability that readily produces groundwater. Soil samples for VOCs analysis will be collected from the less permeable materials encountered, to facilitate examination of the complete vertical distribution of potential carbon tetrachloride contamination at each location. The soil and groundwater sampling will be performed in accord with the procedures in the *Master Work Plan* (Argonne 2002) and the methods specified in Section 3.3. On the basis of these results, potential additional sampling of the soils and/or groundwater at the former CCC/USDA facility, at locations and depths to be determined in the field, will be discussed, if warranted, with the CCC/USDA and KDHE program managers.

Presently available lithologic information for the former CCC/USDA facility and the surrounding area (Section 2.3) suggests that the coring and sampling activities outlined above can be completed by using the Argonne 22-ton, track-mounted cone penetrometer (CPT) unit. If initial efforts to penetrate the unconsolidated sequence to the approximate top of bedrock with the CPT prove unsuccessful, Argonne will consult with the CCC/USDA and KDHE program managers and will have arrangements in place for potential continuation of the field program by using a conventional (sonic) drilling rig.

3.2.2 Task 2. Conduct Vertical Profiling for VOCs Analysis at Selected Locations on the Bendena Ag and Consumer Oil Properties, to Investigate the Vertical and Areal Distribution of Carbon Tetrachloride Contamination and Potential Contaminant Migration Pathways

Carbon tetrachloride contamination has historically been detected in groundwater at a limited number of sampled locations and depths beneath portions of the Bendena Ag property (Section 2.2). To date, no groundwater sampling for VOCs analysis has been performed on the Consumer Oil property, and sampling on the Bendena Ag property has taken place in the absence of location-specific hydrogeologic data that might assist in the identification of potential discrete water-bearing intervals and/or preferred groundwater (contaminant) migration pathways.

To address these concerns, vertical profiling — to include continuous soil coring and soil and groundwater sampling as outlined in Section 3.2.1 — will be conducted at investigative boring locations 5-11 in Figure 3.1. On the basis of the results from these borings, further sampling on the Bendena Ag and/or Consumer Oil properties might be warranted.

3.2.3 Task 3. Determine the Lithologic and Hydrologic Characteristics of the Unconsolidated Units Hosting the Groundwater Flow System

Existing lithologic and hydrologic data pertinent to the former CCC/USDA facility and the adjacent Bendena Ag and Consumer Oil properties are summarized in Section 2.3. On the basis of this information, three potential *aquifer units* have historically been interpreted to exist within a sequence of silty clays and heterogeneous silty to sandy or gravelly tills that underlie the area. The vertical and lateral extent and more detailed internal characteristics of these inferred units remain unclear, partly because of incomplete lithologic information at several previously investigated locations (Section 2.3.2).

As noted in Sections 3.2.1 and 3.2.2, continuous coring of the unconsolidated materials from the ground surface to bedrock will be performed to obtain a record of the subsurface geology and hydrogeology at investigative boring locations 1-11 on the former CCC/USDA, Bendena Ag, and Consumer Oil properties (Figure 3.1). The hydrogeologic sequences at these locations will be characterized in detail to determine the range of lithologies and types of sedimentary units present and to identify water-bearing and potential confining intervals. The sequences observed will also be compared to evaluate the potential vertical and lateral continuity of the hydrologic units beneath and near the former CCC/USDA facility.

At selected locations and depth intervals to be determined in the field, soil samples will also be collected for the measurement of physical properties including particle size distribution, moisture content, porosity, bulk density, and total organic carbon, to facilitate the possible future quantitative estimation of groundwater and carbon tetrachloride migration rates in the saturated zone(s).

3.2.4 Task 4. Install Permanent Groundwater Monitoring Points to Investigate the Patterns of Groundwater Movement

At present, 11 permanent monitoring wells (MW4P,S,D; MW5-MW8, MW9S,D; MW10P,S; Figure 3.1) are distributed among 3 inferred aquifer units: the *perched*, *shallow*, and *lower* aquifers (KDHE 1998). Sporadic measurements of the groundwater levels in these wells (Table 2.6) suggest temporal variations in the groundwater levels across the site, as well as in the magnitude of potential vertical and lateral hydraulic gradients, that might affect groundwater flow in the saturated interval(s). The present network of monitoring points is insufficient, however, to determine the potential 3-dimensional patterns of groundwater flow in this system with confidence (Section 2.3.2.2).

To develop a more detailed understanding of the local groundwater flow, additional permanent monitoring points will be installed (by using the CPT or a sonic drilling rig) to augment the existing array of wells, at selected boring locations to be investigated in Phase I. On the basis of currently available information, the installation of approximately 9 new wells is proposed, as shown in Figure 3.2, to create vertically distinct networks of multiple wells in both the shallow and lower portions of the groundwater system; specific locations and depth intervals for the completion of monitoring wells will be determined in the field, however, subject to the findings of the continuous coring program as this information becomes available. If other potentially significant, vertically distinct water-bearing intervals (the perched aquifer or as-yet-undefined units) are encountered, these might also be considered for the installation of permanent monitoring wells.

Periodically, groundwater levels will be measured manually in the full suite of existing and new monitoring wells (at least 24 hr after each well has been completed), to document the distribution of hydraulic heads in the local flow system. At selected monitoring points, automatic water level sensors and data loggers will also be installed to acquire continuous records of the water level fluctuations that might occur over a proposed minimum period of one year, to identify any short- or longer-term influences on the local levels and patterns of groundwater flow.

Elevation and location control required for evaluation of the potentiometric surface(s) within the system will be obtained via a professional survey (to be conducted by a licensed surveyor) of all the permanent monitoring points.

3.2.5 Task 5. Conduct Groundwater Sampling at the Permanent Monitoring Wells and Nearby Private Wells

Groundwater samples for VOCs analysis will be collected from all available permanent monitoring points (previously existing and newly installed), following well completion and development and the stabilization of groundwater levels, to determine the relationship of the potential carbon tetrachloride concentrations detected in these wells to the concentrations identified at the vertical-profile sampling locations described in Sections 3.2.1 and 3.2.2.

As outlined in Section 2.2, groundwater sampling has been performed periodically in selected private wells near the former CCC/USDA facility and the Bendena Ag and Consumer Oil properties, most recently in 2013 (KDHE 2012). As part of the Phase I studies, the locations, status, and current ownership and usage of identifiable private wells within the town limits and/or in the immediate vicinity of the above properties will be determined. Subject to access, any identified private wells potentially at risk that were not sampled during the KDHE 2013 sampling event will be sampled during Phase I.

The results of this task will provide a self-consistent set of groundwater data for all of the accessible permanent groundwater monitoring points in the Bendena study area, to serve as a current baseline for the consideration and evaluation of potential future sampling event(s).

3.3 Investigation Methods

3.3.1 Methods for Collecting and Logging Soil Cores

At each boring location identified in Sections 3.2.1 and 3.2.2, core samples will be obtained in a continuous profile from approximately 2 ft BGL to the top of bedrock (or refusal of the CPT coring equipment). The cores will be collected by using components of the GeoProbe™ dual-tube or Macro-Core coring systems that have been adapted for use with the Argonne CPT vehicle, or through the use of a sonic drilling rig (if sufficient penetration cannot be achieved with the CPT). All cores will be logged in accord with procedures in the *Master Work Plan* (Argonne 2002) and will be archived upon completion of the Phase I field program at an Argonne facility for future reference.

3.3.2 Methods for Sampling and VOCs Analyses of Soils

At each boring location discussed in Sections 3.2.1 and 3.2.2, soil samples for VOCs analysis will be collected at approximately 4-ft intervals in the finer-grained (silty-clayey) units identified in the stratigraphic sequence. Samples from additional depths in the cored intervals at each boring might also be collected, as necessary, to adequately represent significant variations observed in the lithologies penetrated.

Soil samples for the determination of VOCs will be placed immediately in jars, sealed, and preserved on dry ice, then shipped overnight to the Applied Geosciences and Environmental Management (AGEM) Laboratory at Argonne for rapid-turnaround (typically 24-hr) analysis, so that interim results can be evaluated in the field as the sampling progresses. The soil samples will be analyzed first by a headspace method with a gas chromatograph and electron capture detector (modified EPA Method 5021), on a rapid-turnaround basis. The soil samples will also be subjected to purge-and-trap sample preparation with analysis on a gas chromatograph-mass spectrometer system (EPA Methods 5030B and 8260 B), as described in the *Master Work Plan* (Argonne 2002).

3.3.3 Methods for Groundwater Sampling

Groundwater sampling from the investigative borings (Sections 3.2.1 and 3.2.2) will follow the procedures in the *Master Work Plan* (Argonne 2002).

For groundwater sampling with the CPT, the CPT rods will be used to push a sacrificial tip and 0.5-in.-I.D. polyvinyl chloride (PVC) filter screen and riser to the desired maximum sampling depth. The rods will then be partially withdrawn (a maximum distance of 5 ft) to the desired minimum sampling depth, to expose the screen to the formation waters. Samples will then be recovered from the PVC casing by using a bailer, without purging.

If the use of a sonic drilling rig is required to achieve the Phase I objectives, groundwater samples will be collected by advancing the inner drill string and an outer override casing to the targeted sampling depth, where a grab sample will be collected. Alternatively, if the aquifer produces sufficient water (2 gpm or more), then the inner drill sting will be removed, and a stainless steel screen and inflatable packer assembly will be advanced into the boring. The outer sonic casing will be vibrated upward the desired distance (no more than 5 ft) to expose the

screen, and the packer will be inflated to isolate the screened zone. After purging of a minimum of three times the volume of the isolated sampling zone, the groundwater sample will be collected.

The samples will be collected in laboratory-approved containers and immediately placed in a cooler at 4°C, pending shipment and analysis for VOCs as described in Section 3.3.5.

3.3.4 Methods for Sampling of the Monitoring and Private Wells

Water level measurements and sampling of the accessible private wells and all monitoring wells will be conducted in accord with the procedures outlined in the *Master Work Plan* (Argonne 2002), as follows:

- The well number, the well owner's name, or both will be recorded, with any additional relevant information or observations obtained at the time of sampling.
- If possible, the static groundwater level and then the total depth will be measured and documented for each well.
- Each well will be purged before it is sampled. For functional private wells, the existing, dedicated pump will be used for purging. For monitoring wells and all other private wells, a submersible pump provided by Argonne (Redi-Flo or similar; subject to physical access and the permission of individual well owners) will be used for purging. Groundwater from each well will be purged until field parameters of pH, temperature, conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) are stable. If possible, a minimum of three well volumes will be purged. The field parameters and volume purged will be documented.
- The wells will be sampled after adequate recharge has occurred, but no more than 24 hr after purging.

- Groundwater samples will be collected in laboratory-approved containers and placed immediately in a cooler at 4°C, pending shipment and analysis for VOCs as described in Section 3.3.5.

3.3.5 Methods for Analysis of Water Samples for VOCs

Water samples for the determination of VOCs will be preserved and shipped overnight, on ice at 4°C, to the AGEM Laboratory at Argonne for purge-and-trap sample preparation and analysis on a gas chromatograph-mass spectrometer system (EPA Methods 5030B and 8260B). To ensure reproducibility, a minimum of 10% of the water samples (to be selected in the field) will also be sent to a second laboratory (TestAmerica, Inc., South Burlington, Vermont) for verification analysis with the EPA's Contract Laboratory Program methods, in accord with the procedures in the *Master Work Plan* (Argonne 2002).

3.3.6 Methods for the Installation of Monitoring Wells

Monitoring wells will be installed according to the general procedures in Sections 6.4.3-6.4.6 of the *Master Work Plan* (Argonne 2002). The wells will be constructed by using nominal 1-in.-diameter (for wells installed with the CPT) or 2-in.-diameter (for drilled wells) PVC casing and 0.01-in. mill slot PVC screen of appropriate length for the desired interval and depth of completion. A 10/20 (or #20) filter pack will be used, extending approximately 2 ft above the screened interval. A bentonite pellet seal will be installed above the filter pack, and the remaining annulus will be grouted to the surface by using a tremie pipe.

All wells will be constructed in accordance with KDHE guidelines. Surface completions will consist of KDHE-approved flush mounts or aboveground housings, per the request of the property owner(s) for each well location. After installation, each well will be developed in accordance with the *Master Work Plan* (Argonne 2002).

3.3.7 Methods for Handling and Disposal of Investigation-Derived Waste

The approach to handling and disposal of waste soil and water is as follows:

- Soil cores collected during sampling will be retained in core boxes for lithologic description and research. The cores will be transported to and stored at an Argonne facility for further reference.
- Waste soil from drilling activities (if generated) will be stored on-site in 55-gal drums or a roll-off container. A representative sample will be collected and analyzed by a KDHE-certified laboratory.
- A Solid Waste Disposal Authorization will be obtained from the KDHE for disposal of soil in a permitted landfill. If analytical data indicate that the soils cannot be placed in a permitted landfill, alternative disposal methods will be proposed to the KDHE for review.
- Wastewater will be stored on-site in 55-gal drums or polyurethane containers. If acceptable to the KDHE, the wastewater will be aerated prior to sampling and analysis for VOCs and nitrate.
- The results of the wastewater analyses will be discussed with the KDHE program manager, and an appropriate disposal method will be determined.

3.4 Sampling and Reporting Schedule

The proposed investigation is planned for fall 2013. The CCC/USDA and Argonne will notify the KDHE, Johnson Farms, Bendena Ag, and Consumer Oil a minimum of two weeks before the proposed field activities begin.

A report will be completed and submitted to the KDHE within 90 days upon completion of the investigation and after Argonne completes its quality review of the investigational data. The report will follow the guidelines for site monitoring established by KDHE Policy BER-RS-036 (KDHE 2005). Accordingly, the report will include, at minimum, the following:

- A narrative of work conducted
- Recommendations for further action(s) at the site, if warranted

- Maps depicting sample locations, groundwater flow directions(s), and contaminant levels
- Tables that include all analytical and field data
- Laboratory analytical data reports
- All relevant field documentation
- Quality assurance and quality control data

3.5 Quality Assurance and Quality Control

Procedures necessary to maintain the quality of data will be implemented throughout the proposed investigation. Descriptions of the quality assurance and quality control methods are in Section 4 of the *Master Work Plan* (Argonne 2002).

3.6 Health and Safety

A site-specific health and safety plan will be prepared, approved by the Argonne field safety coordinator, and brought to the site for reference during the investigation.

An Argonne health-safety-environmental protection representative will visit the site during field activities to observe, monitor, and report on operations.

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

Doniphan County has emergency 911 service. All emergency calls, including police, fire, and ambulance calls, will be directed for an appropriate response from this number. No medical facilities exist at Bendena. The nearest hospital with emergency medical facilities is in

Atchison, Kansas (approximately 15 mi from Bendena). Driving directions to the hospital are in Figure 3.3. Additional emergency information is in Table 3.1.

3.7 Contacts

3.7.1 Johnson Farms Contacts

President

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3.7.2 Bendena Ag Contacts

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3.7.3 Consumer Oil Contact

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3.7.4 KDHE Contacts for the Former CCC/USDA Facility

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3.7.5 CCC/USDA Contacts

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3.7.6 Doniphan County Rural Water District No. 2 Contact

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3.7.7 Argonne Contacts

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TABLE 3.1 Emergency information for the investigation at Bendena, Kansas.^a

Resource	Telephone Number	Name
All Emergencies	911	–
Medical Care	855-479-4477 (toll free)	Atchison Hospital ^b 800 Ravenhill Drive Atchison, Kansas
Fire Protection (nonemergency)	785-985-3711	Doniphan County Sheriff 219 South Main Street Troy, Kansas
Police (nonemergency)	785-985-3711	Doniphan County Sheriff 219 South Main Street Troy, Kansas
Industrial Hygiene	630-252-3310	Argonne-Industrial Hygiene
Safety	630-988-9706	EVS Division ^c Field Safety Coordinator (Monte Brandner)
Management	630-252-4878	EVS Division ^c Environmental, Safety, and Health Coordinator (Bill Gasper)
	630-252-7969	AGEM Program Manager (Lorraine LaFreniere)
	630-252-1275 630-408-7114	AGEM Field Project Manager (David Surgnier)
	402-465-9021	AGEM Technical Project Manager (Robert Sedivy)
Security	630-252-5737 630-252-5731	Argonne-Operations Security (workdays) (after hours and weekends)
Poison Control	800-222-1222 or 913-588-6633	Mid-America Poison Control Center, University of Kansas Medical Center
Utilities Survey	800-344-7233 800-DIG-SAFE	Kansas One Call, Wichita, Kansas

^a Post this table in the field operations base.

^b The route from Bendena to the Atchison Hospital is shown in Figure 3.3.

^c Environmental Science Division at Argonne.

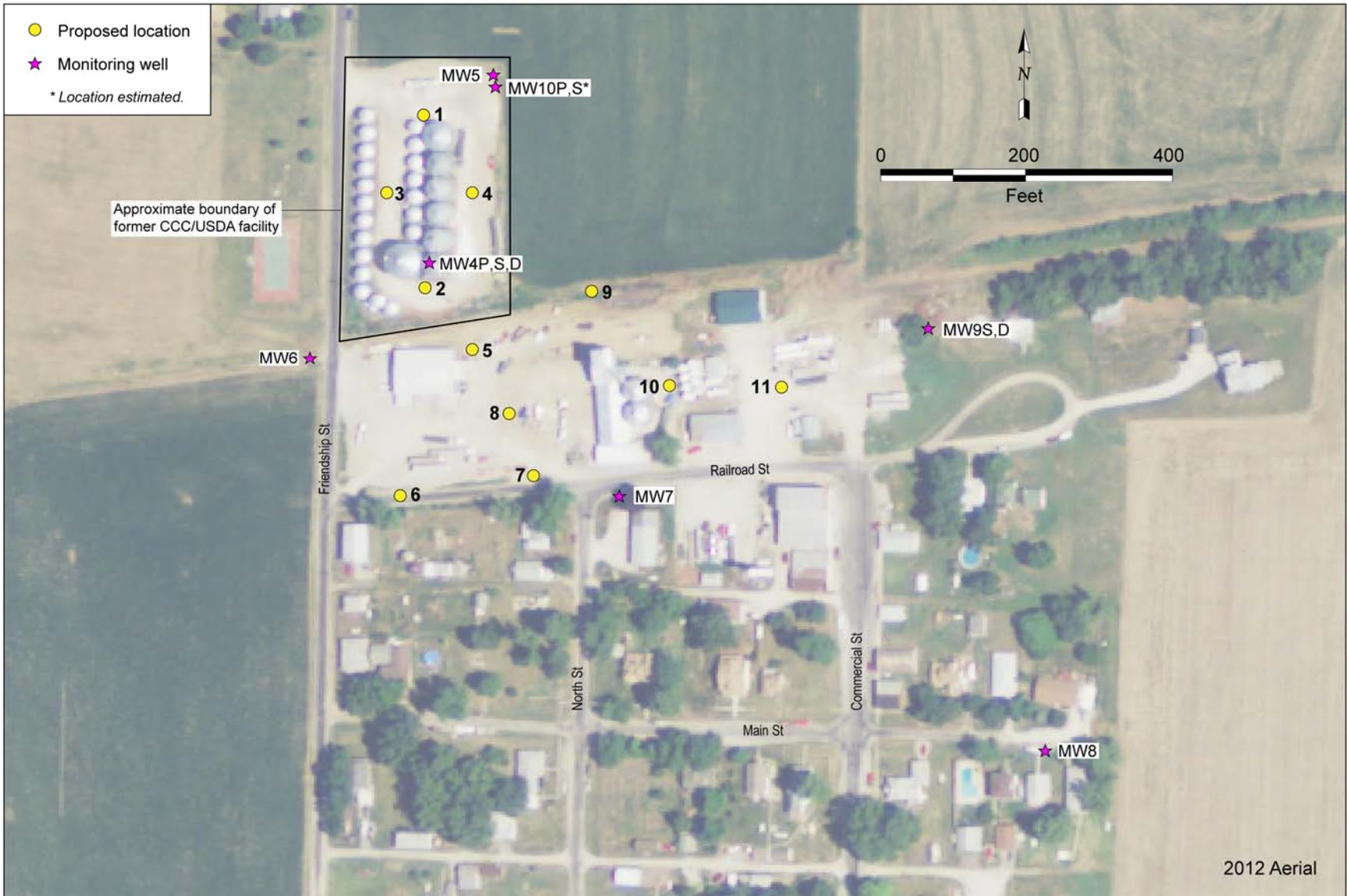


FIGURE 3.1 Proposed locations for investigative borings 1-11, with locations of existing monitoring wells. Source of photograph: NAIP (2012).



FIGURE 3.2 Proposed locations for installation of approximately nine new monitoring wells in the shallow and lower aquifers. Source of photograph: NAIP (2012).

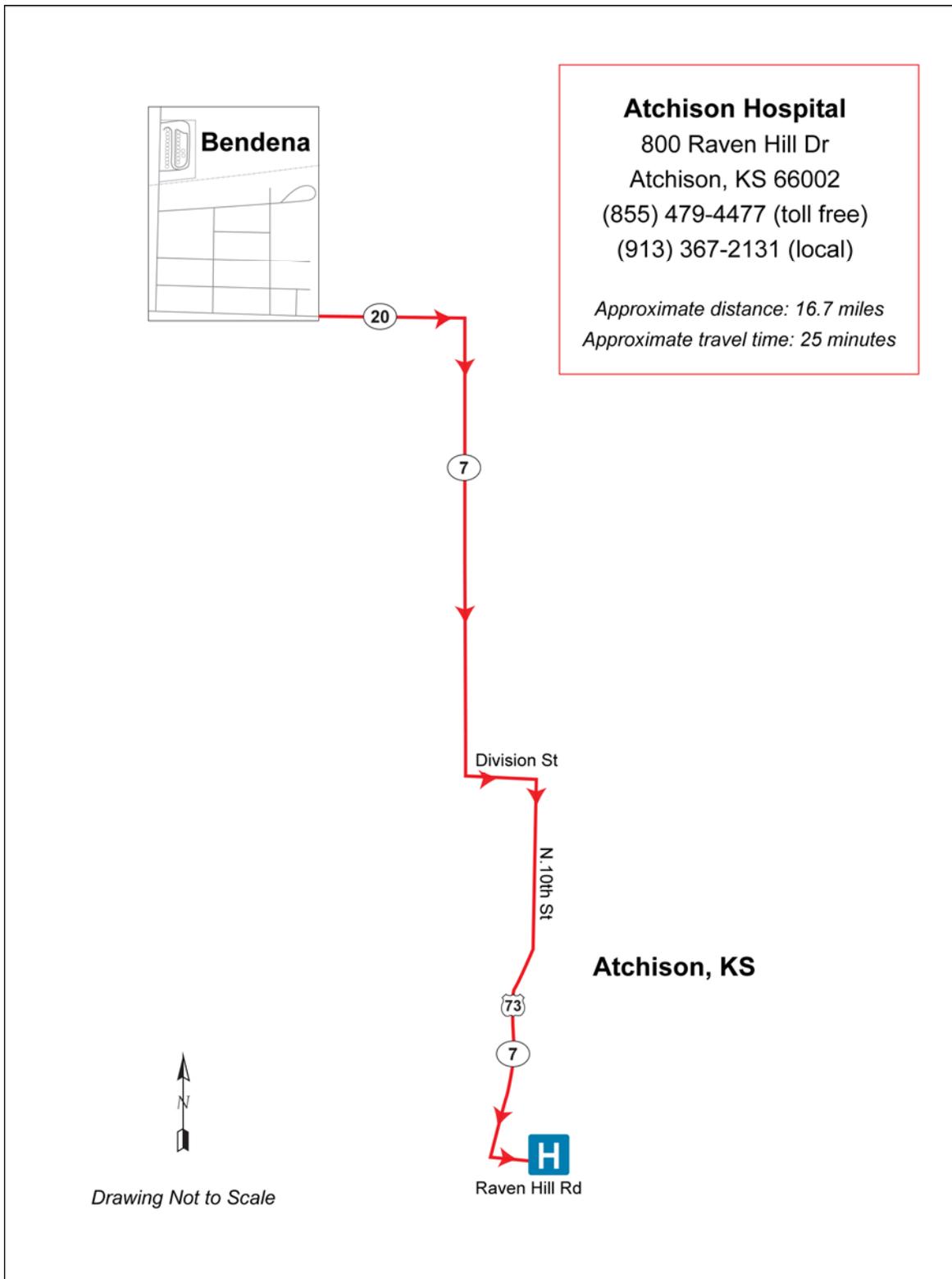


FIGURE 3.3 Emergency route from Bendena to the Atchison Hospital in Atchison, Kansas.

4 References

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Godfrey, G., 2013, telephone conversation between Godfrey (Chairman, Doniphan County Rural Water District No. 2, Bendena, Kansas) and J. Hansen (Environmental Sciences Division,

Argonne National Laboratory, Argonne, Illinois), concerning past and current sources of municipal water used by the town of Bendena, July 29.

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GSI, 2012, *Supplemental Investigation Work Plan Addendum Response to KDHE Comments — Supplemental Voluntary Cleanup Investigation Bendena Ag East and West Properties, Bendena, Kansas*, prepared by Geotechnical Services, Inc., Kansas City, Missouri, for Bendena Ag, Inc., Bendena, Kansas, February 22.

KDHE, 1985a, letter from Gyula F. Kovach (Manager, Bureau of Water Protection, Kansas Department of Health and Environment, Topeka, Kansas) to Gary Godfrey (Chairman, Board of Directors, Doniphan County Rural Water District No. 2, Bendena, Kansas), transmitting results of VOCs analyses on samples collected from the district's well No. 1 on February 26, March 11, and March 22, with recommendation for notification of results to district customers, April 9.

KDHE, 1985b, letter from Gyula F. Kovach (Manager, Bureau of Water Protection, Kansas Department of Health and Environment, Topeka, Kansas) to Gary Godfrey (Chairman, Board of Directors, Doniphan County Rural Water District No. 2, Bendena, Kansas), transmitting a directive from the KDHE to RWD 2 to obtain a contaminant-free water source for the district within 180 days, September 5.

KDHE, 1986a, letter from Gyula F. Kovach (Manager, Bureau of Water Protection, Kansas Department of Health and Environment, Topeka, Kansas) to Gary Godfrey (Chairman, Board of Directors, Doniphan County Rural Water District No. 2, Bendena, Kansas), requesting a plan and schedule to provide contaminant-free water to district customers, February 20.

KDHE, 1986b, letter from Gyula F. Kovach (Manager, Bureau of Water Protection, Kansas Department of Health and Environment, Topeka, Kansas) to Gary Godfrey (Chairman, Board of Directors, Doniphan County Rural Water District No. 2, Bendena, Kansas), extending the deadline for supplying contaminant-free water to district customers until November 1, 1986, March 13.

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KDHE, 1988, *Final Site Inspection Report for the Doniphan County Rural Water District #2 (EPA/KDHE I.D. #KSD981710304)*, prepared for U.S. Environmental Protection Agency, Region VII, Kansas City, Kansas, by Technical Services Section, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, September 15.

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KDHE, 2005, *Scope of Work for Site Monitoring*, Policy BER-RS-036, Remedial Section, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, December (http://www.kdheks.gov/ber/policies/BER_RS_036_SOW.pdf).

KDHE, 2010a, *Bendena RWD #2, PWS #1 Site, Bendena, Kansas, Supplemental Site Investigation Report*, prepared by T. Wells, Geology Associate, Bureau of Environmental Remediation, Remedial Section/State Response & Property Redevelopment Unit, Kansas Department of Health and Environment, Topeka, Kansas, May.

KDHE, 2010b, *Risk Based Standards for Kansas: RSK Manual — 5th Version*, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas, June (www.kdheks.gov/remedial/rsk_manual_page.htm).

KDHE, 2012, *Private Well Sampling Work Plan for Former CCC/USDA Grain Storage Sites*, memorandum from P. Chaffee to C. Carey (Site Restoration Unit, Remedial Section, Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas), December 3.

Larsen, 2012a, *Results of the Comprehensive Nitrate and Ammonia Investigation Conducted at the Johnson Farms, Inc., 924 Friendship Road, Bendena, KS*, prepared for Johnson Farms, Inc., Bendena, Kansas, by Larsen and Associates, Inc., Lawrence, Kansas, February 8.

Larsen, 2012b, *Results of the Phase II Comprehensive Nitrate and Ammonia Investigation Conducted at the Johnson Farms, Inc., 924 Friendship Road, Bendena, KS*, prepared for Johnson Farms, Inc., Bendena, Kansas, by Larsen and Associates, Inc., Lawrence, Kansas, July 17.

Novak and Lay, 1987, letter from D.J. Novak (Novak and Lay Engineers/Surveyors, Hiawatha, Kansas) to Karl Mueldener (Kansas Department of Health and Environment, Topeka, Kansas), describing alternatives for providing contaminant-free water to Doniphan County Rural Water District No. 2 customers, including description of selected alternative and preliminary engineer's cost estimate, March 25.

SDOH, 1964, letter from J. Burris (Kansas State Department of Health, Environmental Health Services, Topeka, Kansas) to G. Clark (Chairman, Rural Water District No. 2, Bendena, Kansas) with recommendations regarding operations and approving the RWD 2 water supply, November 17.

USDA, 1966, *Photo YZ-3GG-66*, U.S. Department of Agriculture Photographic Laboratory, Salt Lake City, Utah, September 9.

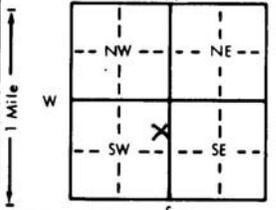
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USGS, 1991, *Digital Orthophoto Quadrangle*, DI000034765, U.S. Geological Survey, EROS Data Center, Sioux Falls, South Dakota, on CD-ROM, October 16.

Appendix A:

Monitoring Well Registrations

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL: County: <u>Doniphan</u>	Fraction <u>SE 1/4 NE 1/4 SW 1/4</u>	Section Number <u>30</u>	Township Number <u>T 3 S</u>	Range Number <u>R 20 W</u>	
Distance and direction from nearest town or city street address of well if located within city? <u>Located approximately 1/2 mile north of town.</u>					
2 WATER WELL OWNER: <u>MW #1 - KDHE (upgradient)</u>					
RR#, St. Address, Box # : City, State, ZIP Code : <u>BENDENA, KANSAS</u>			Board of Agriculture, Division of Water Resources Application Number: _____		
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX: 		4 DEPTH OF COMPLETED WELL: <u>99</u> ft. ELEVATION: <u>1130.185</u>			
Depth(s) Groundwater Encountered 1. _____ ft. 2. _____ ft. 3. _____ ft.					
WELL'S STATIC WATER LEVEL: <u>62.3</u> ft. below land surface measured on mo/day/yr <u>3/25/88</u>					
Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm					
Est. Yield _____ gpm; Well water was _____ ft. after _____ hours pumping _____ gpm					
Bore Hole Diameter: <u>7 1/8</u> in. to _____ ft., and _____ in. to _____ ft.					
WELL WATER TO BE USED AS:					
5 Public water supply 8 Air conditioning 11 Injection well					
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)					
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well					
Was a chemical/bacteriological sample submitted to Department? Yes <u>X</u> No _____; If yes, mo/day/yr sample was submitted <u>5/19/88</u>					
Water Well Disinfected? Yes _____ No _____					
5 TYPE OF BLANK CASING USED:					
1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued _____ Clamped _____					
2 <u>PVC</u> 4 ABS 6 Asbestos-Cement 9 Other (specify below) Welded _____					
7 Fiberglass Threaded <u>Flush Joint</u>					
Blank casing diameter: <u>2</u> in. to <u>99</u> ft., Dia. _____ in. to _____ ft., Dia. _____ in. to _____ ft.					
Casing height above land surface: <u>1.7 ft.</u> x, weight _____ lbs./ft. Wall thickness or gauge No. _____					
TYPE OF SCREEN OR PERFORATION MATERIAL:					
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 10 Asbestos-cement					
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 11 Other (specify) _____					
12 None used (open hole)					
SCREEN OR PERFORATION OPENINGS ARE:					
1 Continuous slot 3 <u>Mill slot</u> 5 Gauzed wrapped 8 Saw cut 11 None (open hole)					
2 Louvered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes					
7 Torch cut 10 Other (specify) _____					
SCREEN-PERFORATED INTERVALS: From <u>84</u> ft. to <u>99</u> ft., From _____ ft. to _____ ft.					
From _____ ft. to _____ ft., From _____ ft. to _____ ft.					
GRAVEL PACK INTERVALS: From <u>26</u> ft. to <u>99</u> ft., From _____ ft. to _____ ft.					
From _____ ft. to _____ ft., From _____ ft. to _____ ft.					
6 GROUT MATERIAL: 1 Neat cement 2 <u>Cement grout</u> 3 <u>Bentonite</u> 4 Other _____					
Grout Intervals: From <u>0</u> ft. to <u>23</u> ft., From <u>23</u> ft. to <u>26</u> ft., From _____ ft. to _____ ft.					
What is the nearest source of possible contamination:					
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well					
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well					
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below) _____					
13 Insecticide storage How many feet? _____					
Direction from well?					
FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4	Topsoil			
4	18	Brown Clay			
18	23	Reddish Brown Clay			
23	33	Dark Brown Clay			
33	38	Light Brown Clay			
38	87	Sandy Gray Clay			
87	99	Coarse Sands with Gravel			
		* Bedrock was not encountered			
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was <u>1) constructed</u> (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) <u>3/23/88</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. _____ This Water Well Record was completed on (mo/day/yr) <u>8/11/88</u> under the business name of <u>KDHE</u> by (signature) <u>[Signature]</u>					
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-296-5514. Send one to WATER WELL OWNER and retain one for your records.					

WATER WELL PLUGGING RECORD Form WWC-5P KSA 82a-1212 ID NO. 2450

1	LOCATION OF WATER WELL: County: <u>Doniphan</u>	Fraction <u>SE 1/4 NE 1/4 SW 1/4</u>	Section Number <u>30</u>	Township Number <u>33</u>	Range Number <u>20 E</u>																																									
Distance and direction from nearest town or city street address of well if located within city? <u>Located approximately 1/8 mile south of town.</u>																																														
2	WATER WELL OWNER: <u>MW #1 - KDHE (upgradient)</u> RR #, St. Address, Box #: <u>Bendena, Kansas</u> City, State, ZIP Code : <u>Bendena, Kansas</u> Board of Agriculture, Division of Water Resources Application Number:																																													
3	MARK WELL'S LOCATION WITH AN "X" IN SECTION BOX: <div style="text-align:center;"> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr><td colspan="2" style="text-align:center;">N</td></tr> <tr><td style="text-align:center;">NW</td><td style="text-align:center;">NE</td></tr> <tr><td style="text-align:center;">W</td><td style="text-align:center;">X</td></tr> <tr><td style="text-align:center;">SW</td><td style="text-align:center;">SE</td></tr> <tr><td colspan="2" style="text-align:center;">S</td></tr> </table> </div>		N		NW	NE	W	X	SW	SE	S		4	DEPTH OF WELL <u>95.26</u> ft. WELL'S STATIC WATER LEVEL <u>59.82</u> ft. WELL WAS USED AS: <table style="width:100%; border:none;"> <tr> <td>1 Domestic</td> <td>5 Public Water Supply</td> <td><input checked="" type="checkbox"/> 8 Dewatering</td> </tr> <tr> <td>2 Irrigation</td> <td>6 Oil Field Water Supply</td> <td><input checked="" type="checkbox"/> 10 Monitoring Well</td> </tr> <tr> <td>3 Feedlot</td> <td>7 Domestic (Lawn & Garden)</td> <td>11 Injection Well</td> </tr> <tr> <td>4 Industrial</td> <td>8 Air Conditioning</td> <td>12 Other</td> </tr> </table> Was a chemical / bacteriological sample submitted to Department? Yes <input checked="" type="checkbox"/> No If yes, mo/day/yr sample was submitted <u>6/18/88</u> Water Well Disinfected: Yes No			1 Domestic	5 Public Water Supply	<input checked="" type="checkbox"/> 8 Dewatering	2 Irrigation	6 Oil Field Water Supply	<input checked="" type="checkbox"/> 10 Monitoring Well	3 Feedlot	7 Domestic (Lawn & Garden)	11 Injection Well	4 Industrial	8 Air Conditioning	12 Other																		
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5	TYPE OF BLANK CASING USED: <table style="width:100%; border:none;"> <tr> <td><input checked="" type="checkbox"/> 1 Steel</td> <td><input type="checkbox"/> 3 RMP (SR)</td> <td><input type="checkbox"/> 5 Wrought</td> <td><input type="checkbox"/> 7 Fiberglass</td> <td><input type="checkbox"/> 9 Other (Specify below)</td> </tr> <tr> <td><input checked="" type="checkbox"/> 2 PVC</td> <td><input type="checkbox"/> 4 ABS</td> <td><input type="checkbox"/> 6 Asbestos-Cement</td> <td><input type="checkbox"/> 8 Concrete Tile</td> <td></td> </tr> </table> Blank casing diameter <u>2</u> in. Was casing pulled? Yes <input checked="" type="checkbox"/> No If yes, how much <u>10 ft.</u> Casing height above or below land surface <u>19</u> in.					<input checked="" type="checkbox"/> 1 Steel	<input type="checkbox"/> 3 RMP (SR)	<input type="checkbox"/> 5 Wrought	<input type="checkbox"/> 7 Fiberglass	<input type="checkbox"/> 9 Other (Specify below)	<input checked="" type="checkbox"/> 2 PVC	<input type="checkbox"/> 4 ABS	<input type="checkbox"/> 6 Asbestos-Cement	<input type="checkbox"/> 8 Concrete Tile																																
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6	GROUT PLUG MATERIAL: <input type="checkbox"/> 1 Neat cement <input type="checkbox"/> 2 Cement grout <input checked="" type="checkbox"/> 3 Bentonite <input type="checkbox"/> 4 Other Grout Plug Intervals: From <u>95.26</u> ft. to <u>Surface</u> From ft. to ft., From to ft. What is the nearest source of possible contamination: <table style="width:100%; border:none;"> <tr> <td>1 Septic tank</td> <td>6 Seepage pit</td> <td>11 Fuel storage</td> <td>16 Other (specify below)</td> </tr> <tr> <td>2 Sewer lines</td> <td>7 Pit privy</td> <td>12 Fertilizer storage</td> <td></td> </tr> <tr> <td>3 Watertight sewer lines</td> <td>8 Sewage lagoon</td> <td>13 Insecticide storage</td> <td></td> </tr> <tr> <td>4 Lateral lines</td> <td>9 Feedyard</td> <td>14 Abandoned water well</td> <td></td> </tr> <tr> <td>5 Cess Pool</td> <td>10 Livestock pens</td> <td>15 Oil well/Gas well</td> <td></td> </tr> </table> Direction from well? How many feet? <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width:15%;">FROM</th> <th style="width:15%;">TO</th> <th style="width:70%;">PLUGGING MATERIALS</th> </tr> </thead> <tbody> <tr> <td><u>95.26'</u></td> <td><u>Surface</u></td> <td><u>Bentonite</u></td> </tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>					1 Septic tank	6 Seepage pit	11 Fuel storage	16 Other (specify below)	2 Sewer lines	7 Pit privy	12 Fertilizer storage		3 Watertight sewer lines	8 Sewage lagoon	13 Insecticide storage		4 Lateral lines	9 Feedyard	14 Abandoned water well		5 Cess Pool	10 Livestock pens	15 Oil well/Gas well		FROM	TO	PLUGGING MATERIALS	<u>95.26'</u>	<u>Surface</u>	<u>Bentonite</u>															
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FROM	TO	PLUGGING MATERIALS																																												
<u>95.26'</u>	<u>Surface</u>	<u>Bentonite</u>																																												
7	CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was plugged under my jurisdiction and was completed on (mo/day/year) <u>1/16/06</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>704</u> This Water Well Record was completed on (mo/day/year) <u>1/17/06</u> under the business name of <u>Max's Enterprises</u> by (signature) <u>Eric Hanzelke</u>																																													
INSTRUCTIONS: Use typewriter or ball point pen. Please press firmly and print clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 785/296-3565. Send one to Water Well Owner and retain one for your records.																																														

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL: County: DONIPHAN	Fraction: NW 1/4 SW 1/4 SE 1/4	Section Number: 33	Township Number: T 03 S	Range Number: R 20 E							
Distance and direction from nearest town or city street address of well if located within city? located in old railroad bed north of grain elevator											
2 WATER WELL OWNER: KDHE - MW #2 (downgradient)											
RR#, St. Address, Box # : City, State, ZIP Code : BENDENA KANSAS			Board of Agriculture, Division of Water Resources Application Number:								
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: 99.55 ft. ELEVATION: 1110.695									
		Depth(s) Groundwater Encountered 1. _____ ft. 2. _____ ft. 3. _____ ft.									
		WELL'S STATIC WATER LEVEL 50.45 ft. below land surface measured on 5/18/88									
Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm											
Est. Yield _____ gpm; Well water was _____ ft. after _____ hours pumping _____ gpm											
Bore Hole Diameter: 7 1/8 in. to _____ ft., and _____ in. to _____ ft.											
WELL WATER TO BE USED AS:											
<input type="checkbox"/> 5 Public water supply <input type="checkbox"/> 8 Air conditioning <input type="checkbox"/> 11 Injection well <input type="checkbox"/> 1 Domestic <input type="checkbox"/> 3 Feedlot <input type="checkbox"/> 6 Oil field water supply <input type="checkbox"/> 9 Dewatering <input type="checkbox"/> 12 Other (Specify below) <input type="checkbox"/> 2 Irrigation <input type="checkbox"/> 4 Industrial <input type="checkbox"/> 7 Lawn and garden only <input checked="" type="checkbox"/> 10 Monitoring well											
Was a chemical/bacteriological sample submitted to Department? Yes <input checked="" type="checkbox"/> No _____; If yes, mo/day/yr sample was submitted 5/18/88											
Water Well Disinfected? Yes _____ No _____											
5 TYPE OF BLANK CASING USED:											
<input type="checkbox"/> 1 Steel <input type="checkbox"/> 3 RMP (SR) <input type="checkbox"/> 5 Wrought iron <input type="checkbox"/> 8 Concrete tile CASING JOINTS: Glued _____ Clamped _____ <input checked="" type="checkbox"/> 2 PVC <input type="checkbox"/> 4 ABS <input type="checkbox"/> 6 Asbestos-Cement <input type="checkbox"/> 9 Other (specify below) Welded _____ <input type="checkbox"/> 7 Fiberglass Threaded Flush Joint											
Blank casing diameter 2 in. to 99.55 ft., Dia _____ in. to _____ ft., Dia _____ in. to _____ ft.											
Casing height above land surface _____ in., weight _____ lbs./ft. Wall thickness or gauge No. _____											
TYPE OF SCREEN OR PERFORATION MATERIAL:											
<input type="checkbox"/> 1 Steel <input type="checkbox"/> 3 Stainless steel <input type="checkbox"/> 5 Fiberglass <input checked="" type="checkbox"/> 7 PVC <input type="checkbox"/> 10 Asbestos-cement <input type="checkbox"/> 2 Brass <input type="checkbox"/> 4 Galvanized steel <input type="checkbox"/> 6 Concrete tile <input type="checkbox"/> 8 RMP (SR) <input type="checkbox"/> 11 Other (specify) _____ <input type="checkbox"/> 12 None used (open hole)											
SCREEN OR PERFORATION OPENINGS ARE:											
<input type="checkbox"/> 1 Continuous slot <input type="checkbox"/> 3 Mill slot <input type="checkbox"/> 5 Gauzed wrapped <input type="checkbox"/> 8 Saw cut <input type="checkbox"/> 11 None (open hole) <input type="checkbox"/> 2 Louvered shutter <input type="checkbox"/> 4 Key punched <input type="checkbox"/> 6 Wire wrapped <input type="checkbox"/> 7 Torch cut <input type="checkbox"/> 9 Drilled holes <input type="checkbox"/> 10 Other (specify) _____											
SCREEN-PERFORATED INTERVALS: From 84.55 ft. to 99.55 ft., From _____ ft. to _____ ft.											
From _____ ft. to _____ ft., From _____ ft. to _____ ft.											
GRAVEL PACK INTERVALS: From 25 ft. to 99.55 ft., From _____ ft. to _____ ft.											
From _____ ft. to _____ ft., From _____ ft. to _____ ft.											
6 GROUT MATERIAL: <input type="checkbox"/> 1 Neat cement <input checked="" type="checkbox"/> 2 Cement grout <input checked="" type="checkbox"/> 3 Bentonite <input type="checkbox"/> 4 Other _____											
Grout Intervals: From 0 ft. to 22 ft., From 22 ft. to 25 ft., From _____ ft. to _____ ft.											
What is the nearest source of possible contamination:											
<input type="checkbox"/> 1 Septic tank <input type="checkbox"/> 4 Lateral lines <input type="checkbox"/> 7 Pit privy <input type="checkbox"/> 10 Livestock pens <input type="checkbox"/> 14 Abandoned water well <input type="checkbox"/> 2 Sewer lines <input type="checkbox"/> 5 Cess pool <input type="checkbox"/> 8 Sewage lagoon <input type="checkbox"/> 11 Fuel storage <input type="checkbox"/> 15 Oil well/Gas well <input type="checkbox"/> 3 Watertight sewer lines <input type="checkbox"/> 6 Seepage pit <input type="checkbox"/> 9 Feedyard <input type="checkbox"/> 12 Fertilizer storage <input type="checkbox"/> 16 Other (specify below) _____ <input type="checkbox"/> 13 Insecticide storage											
Direction from well? _____ How many feet? _____											
FROM		TO		LITHOLOGIC LOG		FROM		TO		PLUGGING INTERVALS	
0		4		Topsoil							
4		15		Brown Silty Clay							
15		25		Brown Clay							
25		30		x Brown fine Sandy Clay							
30		65		Gray Sandy Clay							
65		74		x Coarse Sands							
74		80		Yellow medium Sand							
80		88		Black Silt							
88		95		Yellow Medium Sand							
95		100		Black Silt							
* Bedrock was not encountered											
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was <input checked="" type="checkbox"/> (1) constructed, <input type="checkbox"/> (2) reconstructed, or <input type="checkbox"/> (3) plugged under my jurisdiction and was completed on (mo/day/year) 4/13/88 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. _____ This Water Well Record was completed on (mo/day/yr) 5/11/88 under the business name of KDHE by (signature) [Signature]											
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send two copies to Kansas Department of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-296-5514. Send one to WATER WELL OWNER and retain one for your records.											

WATER WELL PLUGGING RECORD Form WWC-5P KSA 82a-1212 ID NO. 2456

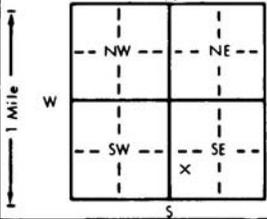
1 LOCATION OF WATER WELL: County: <u>Doniphan</u>	Fraction <u>NW 1/4 SW 1/4 SE 1/4</u>	Section Number <u>33</u>	Township Number <u>3 S</u>	Range Number <u>20 E</u>																					
Distance and direction from nearest town or city street address of well if located within city? <u>Located in old railroad bed north of grain elevator</u>																									
2 WATER WELL OWNER: <u>KDHE - MW #2 (down gradient)</u> RR #, St. Address, Box #: _____ City, State, ZIP Code : <u>Bendena, Kansas</u> Board of Agriculture, Division of Water Resources Application Number: _____																									
3 MARK WELL'S LOCATION WITH AN "X" IN SECTION BOX: <div style="text-align: center; border: 1px solid black; width: 100px; height: 100px; margin: 5px auto; position: relative;"> <div style="position: absolute; top: -10px; left: 50%; transform: translate(-50%, -100%);">N</div> <div style="position: absolute; bottom: -10px; left: 50%; transform: translate(-50%, -100%);">S</div> <div style="position: absolute; left: -30px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -30px; top: 50%; transform: translateY(-50%);">E</div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> <table style="border-collapse: collapse; text-align: center; width: 100%;"> <tr><td style="border: 1px solid black; width: 20px; height: 20px;"></td><td style="border: 1px solid black; width: 20px; height: 20px;"></td><td style="border: 1px solid black; width: 20px; height: 20px;"></td></tr> <tr><td style="border: 1px solid black; width: 20px; height: 20px;">NW</td><td style="border: 1px solid black; width: 20px; height: 20px;"></td><td style="border: 1px solid black; width: 20px; height: 20px;">NE</td></tr> <tr><td style="border: 1px solid black; width: 20px; height: 20px;"></td><td style="border: 1px solid black; width: 20px; height: 20px; text-align: center;">X</td><td style="border: 1px solid black; width: 20px; height: 20px;"></td></tr> <tr><td style="border: 1px solid black; width: 20px; height: 20px;">SW</td><td style="border: 1px solid black; width: 20px; height: 20px;"></td><td style="border: 1px solid black; width: 20px; height: 20px;">SE</td></tr> </table> </div> </div>				NW		NE		X		SW		SE	4 DEPTH OF WELL <u>97.47</u> ft. WELL'S STATIC WATER LEVEL <u>49.13</u> ft. WELL WAS USED AS: <table style="width: 100%; font-size: small;"> <tr><td>1 Domestic</td><td>5 Public Water Supply</td><td>9 Dewatering</td></tr> <tr><td>2 Irrigation</td><td>6 Oil Field Water Supply</td><td>10 <u>Monitoring Well</u></td></tr> <tr><td>3 Feedlot</td><td>7 Domestic (Lawn & Garden)</td><td>11 Injection Well</td></tr> <tr><td>4 Industrial</td><td>8 Air Conditioning</td><td>12 Other</td></tr> </table> Was a chemical / bacteriological sample submitted to Department? Yes <u>X</u> No _____ If yes, mo/day/yr sample was submitted <u>5/18/88</u> Water Well Disinfected: Yes _____ No _____	1 Domestic	5 Public Water Supply	9 Dewatering	2 Irrigation	6 Oil Field Water Supply	10 <u>Monitoring Well</u>	3 Feedlot	7 Domestic (Lawn & Garden)	11 Injection Well	4 Industrial	8 Air Conditioning	12 Other
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6 GROUT PLUG MATERIAL: 1 Neat cement 2 Cement grout 3 <u>Bentonite</u> 4 Other _____ Grout Plug Intervals: From <u>97.47</u> ft. to <u>Surface</u> From _____ ft. to _____ ft., From _____ to _____ ft. What is the nearest source of possible contamination: <table style="width: 100%; font-size: small;"> <tr><td>1 Septic tank</td><td>6 Seepage pit</td><td>11 Fuel storage</td><td>16 Other (specify below)</td></tr> <tr><td>2 Sewer lines</td><td>7 Pit privy</td><td>12 Fertilizer storage</td><td></td></tr> <tr><td>3 Watertight sewer lines</td><td>8 Sewage lagoon</td><td>13 Insecticide storage</td><td></td></tr> <tr><td>4 Lateral lines</td><td>9 Feedyard</td><td>14 Abandoned water well</td><td></td></tr> <tr><td>5 Cess Pool</td><td>10 Livestock pens</td><td>15 Oil well/Gas well</td><td></td></tr> </table> Direction from well? _____ How many feet? _____					1 Septic tank	6 Seepage pit	11 Fuel storage	16 Other (specify below)	2 Sewer lines	7 Pit privy	12 Fertilizer storage		3 Watertight sewer lines	8 Sewage lagoon	13 Insecticide storage		4 Lateral lines	9 Feedyard	14 Abandoned water well		5 Cess Pool	10 Livestock pens	15 Oil well/Gas well		
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<u>97.47</u>	<u>Surface</u>	<u>Bentonite</u>																							
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was plugged under my jurisdiction and was completed on (mo/day/year) <u>11/10/06</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>704</u> This Water Well Record was completed on (mo/day/year) <u>11/10/06</u> under the business name of <u>MAX'S ENTERPRISES</u> by (signature) <u>Jawad Hussain</u>																									
INSTRUCTIONS: Use typewriter or ball point pen. Please press firmly and print clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 785/296-3565. Send one to Water Well Owner and retain one for your records.																									

WATER WELL RECORD Form WWC-5 KSA 82a-1212

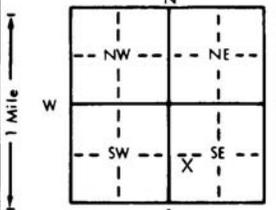
1 LOCATION OF WATER WELL: County: <u>DONIPHAN</u>	Fraction <u>SW 1/4 SW 1/4 SE 1/4</u>	Section Number <u>33</u>	Township Number <u>T 03 S</u>	Range Number <u>R 20 EW</u>	
Distance and direction from nearest town or city street address of well if located within city? <u>located on the far southwest edge of town on Bob Dickson's Property</u>					
2 WATER WELL OWNER: <u>KDHE - MW #3 (downgradient)</u>					
RR#, St. Address, Box # : City, State, ZIP Code : <u>BENDENA, KANSAS</u>			Board of Agriculture, Division of Water Resources Application Number:		
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: <u>71.4</u> ft. ELEVATION: <u>1085.365</u>			
		Depth(s) Groundwater Encountered 1. _____ ft. 2. _____ ft. 3. _____ ft.			
		WELL'S STATIC WATER LEVEL <u>25</u> ft. below land surface measured on mo/day/yr <u>4/20/88</u>			
Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm					
Est. Yield _____ gpm; Well water was _____ ft. after _____ hours pumping _____ gpm					
Bore Hole Diameter <u>7 7/8</u> in. to _____ ft., and _____ in. to _____ ft.					
WELL WATER TO BE USED AS:					
<input type="checkbox"/> 1 Domestic <input type="checkbox"/> 3 Feedlot <input type="checkbox"/> 6 Oil field water supply <input type="checkbox"/> 9 Dewatering <input type="checkbox"/> 12 Other (Specify below)					
<input type="checkbox"/> 2 Irrigation <input type="checkbox"/> 4 Industrial <input type="checkbox"/> 7 Lawn and garden only <input checked="" type="checkbox"/> 10 Monitoring well					
Was a chemical/bacteriological sample submitted to Department? Yes <u>X</u> No _____; If yes, mo/day/yr sample was submitted <u>5/18/88</u>					
Water Well Disinfected? Yes _____ No _____					
5 TYPE OF BLANK CASING USED:					
<input type="checkbox"/> 1 Steel <input type="checkbox"/> 3 RMP (SR) <input type="checkbox"/> 5 Wrought iron <input type="checkbox"/> 8 Concrete tile CASING JOINTS: Glued _____ Clamped _____					
<input checked="" type="checkbox"/> 2 PVC <input type="checkbox"/> 4 ABS <input type="checkbox"/> 6 Asbestos-Cement <input type="checkbox"/> 9 Other (specify below) Welded _____					
<input type="checkbox"/> 7 Fiberglass _____ Threaded <u>flush joint</u>					
Blank casing diameter <u>2</u> in. to <u>71.4</u> ft., Dia _____ in. to _____ ft., Dia _____ in. to _____ ft.					
Casing height above land surface _____ in., weight _____ lbs./ft. Wall thickness or gauge No. _____					
TYPE OF SCREEN OR PERFORATION MATERIAL:					
<input type="checkbox"/> 1 Steel <input type="checkbox"/> 3 Stainless steel <input type="checkbox"/> 5 Fiberglass <input checked="" type="checkbox"/> 7 PVC <input type="checkbox"/> 10 Asbestos-cement					
<input type="checkbox"/> 2 Brass <input type="checkbox"/> 4 Galvanized steel <input type="checkbox"/> 6 Concrete tile <input type="checkbox"/> 8 RMP (SR) <input type="checkbox"/> 11 Other (specify)					
<input type="checkbox"/> 12 None used (open hole)					
SCREEN OR PERFORATION OPENINGS ARE:					
<input type="checkbox"/> 1 Continuous slot <input type="checkbox"/> 3 Mill slot <input type="checkbox"/> 5 Gauzed wrapped <input type="checkbox"/> 8 Saw cut <input type="checkbox"/> 11 None (open hole)					
<input type="checkbox"/> 2 Louvered shutter <input type="checkbox"/> 4 Key punched <input type="checkbox"/> 6 Wire wrapped <input type="checkbox"/> 9 Drilled holes					
<input type="checkbox"/> 7 Torch cut <input type="checkbox"/> 10 Other (specify)					
SCREEN-PERFORATED INTERVALS: From <u>61.4</u> ft. to <u>71.4</u> ft., From _____ ft. to _____ ft., From _____ ft. to _____ ft.					
GRAVEL PACK INTERVALS: From <u>25</u> ft. to <u>71.4</u> ft., From _____ ft. to _____ ft., From _____ ft. to _____ ft.					
6 GROUT MATERIAL: <input type="checkbox"/> 1 Neat cement <input checked="" type="checkbox"/> 2 Cement grout <input checked="" type="checkbox"/> 3 Bentonite <input type="checkbox"/> 4 Other _____					
Grout Intervals: From <u>0</u> ft. to <u>22</u> ft., From <u>22</u> ft. to <u>25</u> ft., From _____ ft. to _____ ft.					
What is the nearest source of possible contamination:					
<input type="checkbox"/> 1 Septic tank <input type="checkbox"/> 4 Lateral lines <input type="checkbox"/> 7 Pit privy <input type="checkbox"/> 10 Livestock pens <input type="checkbox"/> 14 Abandoned water well					
<input type="checkbox"/> 2 Sewer lines <input type="checkbox"/> 5 Cess pool <input type="checkbox"/> 8 Sewage lagoon <input type="checkbox"/> 11 Fuel storage <input type="checkbox"/> 15 Oil well/Gas well					
<input type="checkbox"/> 3 Watertight sewer lines <input type="checkbox"/> 6 Seepage pit <input type="checkbox"/> 9 Feedyard <input type="checkbox"/> 12 Fertilizer storage <input type="checkbox"/> 16 Other (specify below)					
<input type="checkbox"/> 13 Insecticide storage					
Direction from well? _____ How many feet? _____					
LITHOLOGIC LOG					
FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4	Topsoil			
5	12	Brown Clay			
12	17	Gray Clay			
17	22	Brown Clay			
22	25	Brown Sandy Clay			
25	33	Gray Sandy Clay			
33	35	Gray Sandy Clay with Gravel			
35	45	Gray Sandy Clay			
45	51	Sandy Gravel with Clay			
51	64	Clayey Gravel with Black streaks			
64	68	Black Silt			
68	71.4	Coarse Sands and Gravel			
* BEDROCK WAS NOT ENCOUNTERED					
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was <u>(1) constructed</u> , <u>(2) reconstructed</u> , or <u>(3) plugged</u> under my jurisdiction and was completed on (mo/day/year) <u>3/25/88</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. _____ This Water Well Record was completed on (mo/day/yr) <u>8/11/88</u> under the business name of <u>KDHE</u> by (signature) _____					
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-296-5514. Send one to WATER WELL OWNER and retain one for your records.					

WATER WELL PLUGGING RECORD Form WWC-5P KSA 82a-1212 ID NO. 2456

<p>1 LOCATION OF WATER WELL: County: <u>Doniphan</u></p>	<p>Fraction <u>SW 1/4 SW 1/4 SE 1/4</u></p>	<p>Section Number <u>33</u></p>	<p>Township Number <u>3 S</u></p>	<p>Range Number <u>20 E</u></p>																					
<p>Distance and direction from nearest town or city street address of well if located within city? <u>Located on the far southwest edge of town on Bob Dickson's property</u></p>																									
<p>2 WATER WELL OWNER: <u>KDHE - MW # 3 (down gradient)</u> RR #, St. Address, Box #: <u>Bendena, Kansas</u> City, State, ZIP Code : <u>Bendena, Kansas</u> Board of Agriculture, Division of Water Resources Application Number:</p>																									
<p>3 MARK WELL'S LOCATION WITH AN "X" IN SECTION BOX:</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr><td colspan="3" style="text-align: center;">N</td></tr> <tr><td style="text-align: center;">NW</td><td style="text-align: center;"> </td><td style="text-align: center;">NE</td></tr> <tr><td style="text-align: center;">W</td><td style="text-align: center;"> </td><td style="text-align: center;">E</td></tr> <tr><td style="text-align: center;">SW</td><td style="text-align: center;"> </td><td style="text-align: center;">SE</td></tr> <tr><td colspan="3" style="text-align: center;">S</td></tr> </table> <p style="text-align: center;">X</p> </div>		N			NW		NE	W		E	SW		SE	S			<p>4 DEPTH OF WELL <u>69.14</u> ft WELL'S STATIC WATER LEVEL <u>23.14</u> ft. WELL WAS USED AS: 1 Domestic 5 Public Water Supply 9 Dewatering 2 Irrigation 6 Oil Field Water Supply 10 Monitoring Well 3 Feedlot 7 Domestic (Lawn & Garden) 11 Injection Well 4 Industrial 8 Air Conditioning 12 Other</p> <p>Was a chemical / bacteriological sample submitted to Department? Yes <u>X</u> No</p> <p>If yes, mo/day/yr sample was submitted <u>5/18/88</u></p> <p>Water Well Disinfected: Yes No</p>								
N																									
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W		E																							
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<p>5 TYPE OF BLANK CASING USED: 1 Steel 3 RMP (SR) 5 Wrought 7 Fiberglass 9 Other (Specify below) 2 PVC 4 ABS 6 Asbestos-Cement 8 Concrete Tile</p> <p>Blank casing diameter <u>2</u> in. Was casing pulled? Yes <u>X</u> No If yes, how much <u>~15'</u></p> <p>Casing height above or below land surface</p>																									
<p>6 GROUT PLUG MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other</p> <p>Grout Plug Intervals: From <u>69.14</u> ft. to <u>Surface</u> ft., From ft. to ft., From ft. to ft.</p> <p>What is the nearest source of possible contamination: 1 Septic tank 6 Seepage pit 11 Fuel storage 16 Other (specify below) 2 Sewer lines 7 Pit privy 12 Fertilizer storage</p> <p>3 Watertight sewer lines 8 Sewage lagoon 13 Insecticide storage</p> <p>4 Lateral lines 9 Feedyard 14 Abandoned water well</p> <p>5 Cess Pool 10 Livestock pens 15 Oil well/Gas well</p> <p>Direction from well? How many feet?</p>																									
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<p>7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was plugged under my jurisdiction and was completed on (mo/day/year) <u>11/19/05</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>704</u> This Water Well Record was completed on (mo/day/year) <u>11/19/05</u> under the business name of <u>Max's Enterprises</u> by (signature) <u>Daniel Flanagan</u></p>																									
<p>INSTRUCTIONS: Use typewriter or ball point pen. Please press firmly and print clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 785/296-3565. Send one to Water Well Owner and retain one for your records.</p>																									

WATER WELL RECORD Form WWC-5 KSA 82a-1212					
1 LOCATION OF WATER WELL: County: <u>Doniphan</u>		Fraction <u>NW 1/4 SW 1/4 SE 1/4</u>	Section Number <u>33</u>	Township Number <u>T 03 S</u>	Range Number <u>R 20 E</u>
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>					
2 WATER WELL OWNER: <u>KDHE</u> RR#, St. Address, Box # : <u>Forbes Field, Building 740</u> Board of Agriculture, Division of Water Resources City, State, ZIP Code : <u>Topeka, KS 66620</u> Application Number:					
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX: 		4 DEPTH OF COMPLETED WELL: <u>30</u> ft. ELEVATION: Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft. WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr Pump test data: Well water was ft. after hours pumping gpm Est. Yield gpm: Well water was ft. after hours pumping gpm Bore Hole Diameter in. to ft., and in. to ft. WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well 1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below) 2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well <u>MW-04P</u> Was a chemical/bacteriological sample submitted to Department? Yes.....No.....; If yes, mo/day/yr sample was submitted Water Well Disinfected? Yes No			
5 TYPE OF BLANK CASING USED: 1 Steel 3 RMP (SR) 2 PVC 4 ABS Blank casing diameter in. to ft., Dia in. to ft., Dia in. to ft. Casing height above land surface in., weight lbs./ft. Wall thickness or gauge No. Sch. <u>40</u>		5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped 6 Asbestos-Cement 9 Other (specify below) Welded 7 Fiberglass Threaded <u>x</u> TYPE OF SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement 1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) 2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole) SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole) 1 Continuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes 2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) SCREEN-PERFORATED INTERVALS: From <u>30</u> ft. to <u>20</u> ft., From ft. to ft. From ft. to ft., From ft. to ft. GRAVEL PACK INTERVALS: From <u>30</u> ft. to <u>18</u> ft., From ft. to ft. From ft. to ft., From ft. to ft.			
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other Grout Intervals: From <u>18</u> ft. to <u>0</u> ft., From ft. to ft., From ft. to ft. What is the nearest source of possible contamination: 1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well 2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well 3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below) 13 Insecticide storage Direction from well? How many feet?					
FROM		TO		LITHOLOGIC LOG	
				Not sampled	
FROM		TO		PLUGGING INTERVALS	
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) <u>3/5/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> . This Water Well Record was completed on (mo/d/yr) <u>4/9/98</u> under the business name of <u>J & R Drilling Services, Inc.</u> by (signature) <u>Don Carlson</u>					
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.					

OFFICE USE ONLY
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1/4

WATER WELL RECORD Form WWC-5 KSA 82a-1212																																																																													
1 LOCATION OF WATER WELL: County: <u>Doniphan</u>		Fraction NW ¼ SW ¼ SE ¼	Section Number <u>33</u>	Township Number T <u>03</u> S	Range Number R <u>20</u> EXX																																																																								
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>																																																																													
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3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX: 		4 DEPTH OF COMPLETED WELL: <u>140</u> ft. ELEVATION: Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft. WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr Pump test data: Well water was ft. after hours pumping gpm Est. Yield gpm: Well water was ft. after hours pumping gpm Bore Hole Diameter: in. to ft., and in. to ft. WELL WATER TO BE USED AS: 1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below) 2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well MW-040 Was a chemical/bacteriological sample submitted to Department? Yes.....No.....; If yes, mo/day/yr sample was submitted Water Well Disinfected? Yes No																																																																											
5 TYPE OF BLANK CASING USED: 1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped 2 PVC 4 ABS 6 Asbestos-Cement 9 Other (specify below) Welded 7 Fiberglass Threaded <u>X</u> Blank casing diameter in. to 1.11 ft., Dia in. to ft., Dia in. to ft. Casing height above land surface in., weight lbs./ft. Wall thickness or gauge No. <u>Sch 40</u> TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) 2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole) SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 3 Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole) 2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) SCREEN-PERFORATED INTERVALS: From 126 ft. to 111 ft., From ft. to ft. GRAVEL PACK INTERVALS: From 129 ft. to 108.5 ft., From ft. to ft. From ft. to ft., From ft. to ft.																																																																													
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other Grout Intervals: From 140 ft. to 129 ft., From 108.5 ft. to 0 ft., From ft. to ft. What is the nearest source of possible contamination: 1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well 2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well 3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below) 13 Insecticide storage Direction from well? FROM TO LITHOLOGIC LOG FROM TO PLUGGING INTERVALS																																																																													
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7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) XXXXXX <u>3/4/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> This Water Well Record was completed on (mo/day/yr) <u>4/9/98</u> under the business name of <u>J S R Drilling Services, Inc.</u> by (signature) <u>Jon Carlson</u>																																																																													
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.																																																																													

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WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL:		Fraction		Section Number	Township Number	Range Number
County: <u>Doniphan</u>		NW ¼	SW ¼	33	T 03 S	R 20 E XX
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>						
2 WATER WELL OWNER: <u>KDHE</u>						
RR#, St. Address, Box # : <u>Forbes Field, Building 740</u>				Board of Agriculture, Division of Water Resources		
City, State, ZIP Code : <u>Topeka, KS 66620</u>				Application Number:		
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: <u>140</u> ft. ELEVATION: _____				
		Depth(s) Groundwater Encountered 1. _____ ft. 2. _____ ft. 3. _____ ft.				
		WELL'S STATIC WATER LEVEL _____ ft. below land surface measured on mo/day/yr _____				
		Pump test data: Well water was _____ ft. after _____ hours pumping _____ gpm				
		Est. Yield _____ gpm: Well water was _____ ft. after _____ hours pumping _____ gpm				
Bore Hole Diameter _____ B. in. to _____ ft. and _____ in. to _____ ft.		WELL WATER TO BE USED AS:				
1 Domestic		3 Feedlot		6 Oil field water supply		8 Air conditioning
2 Irrigation		4 Industrial		7 Lawn and garden only		10 Monitoring well <u>MW-05</u>
11 Injection well		12 Other (Specify below)				
Was a chemical/bacteriological sample submitted to Department? Yes _____ No _____; If yes, mo/day/yr sample was submitted _____						
Water Well Disinfected? Yes _____ No _____						
5 TYPE OF BLANK CASING USED:						
1 Steel		3 RMP (SR)		6 Asbestos-Cement		9 Other (specify below)
2 PVC		4 ABS		7 Fiberglass		10 Asbestos-cement
Blank casing diameter _____ in. to _____ in.		Dia _____ in. to _____ ft.		Dia _____ in. to _____ ft.		_____
Casing height above land surface _____ in.		weight _____ lbs./ft.		Wall thickness or gauge No. <u>Sch 40</u>		_____
TYPE OF SCREEN OR PERFORATION MATERIAL:						
1 Steel		3 Stainless steel		5 Fiberglass		8 RMP (SR)
2 Brass		4 Galvanized steel		6 Concrete tile		9 ABS
SCREEN OR PERFORATION OPENINGS ARE:		5 Gauzed wrapped		8 Saw cut		11 None (open hole)
1 Continuous slot		3 Mill slot		6 Wire wrapped		9 Drilled holes
2 Louvered shutter		4 Key punched		7 Torch cut		10 Other (specify) _____
SCREEN-PERFORATED INTERVALS:						
From _____ ft. to _____ ft.		From _____ ft. to _____ ft.		From _____ ft. to _____ ft.		From _____ ft. to _____ ft.
GRAVEL PACK INTERVALS:						
From _____ ft. to _____ ft.		From _____ ft. to _____ ft.		From _____ ft. to _____ ft.		From _____ ft. to _____ ft.
6 GROUT MATERIAL:						
1 Neat cement		2 Cement grout		3 Bentonite		4 Other _____
Grout Intervals: From _____ ft. to _____ ft.						
What is the nearest source of possible contamination:						
1 Septic tank		4 Lateral lines		7 Pit privy		10 Livestock pens
2 Sewer lines		5 Cess pool		8 Sewage lagoon		11 Fuel storage
3 Watertight sewer lines		6 Seepage pit		9 Feedyard		12 Fertilizer storage
						13 Insecticide storage
						14 Abandoned water well
						15 Oil well/Gas well
						16 Other (specify below)
Direction from well? _____ How many feet? _____						
LITHOLOGIC LOG						
FROM	TO		FROM	TO	Cont.	
0	5	Topsoil/Silt w/clay brown soft damp	111	115	Clay gray damp stiff plastic	
5	12	Clay/Silt brown w/gray moist soft	115	120	Clay/Sand gray-green wet loose	
12	19	Clay/Silt gray w/red-brown damp soft	120	125	Silt gray-black dry-damp sand/med	
19	23	Clay/Silt gray/red damp firm	125	127	Sand fine-med gravel wet loose	
23	46	Clay damp to dry brown/gray stiff	127	131	Silt/Clay gray-blk loose wet	
46	47	Clay gray stiff dry-damp plastic	131	132	Gravel wet loose	
47	88	Silt red-brown dry-damp gravel	132	140	Silt/clay	
88	89	Sand medium brown loose wet				
89	95	Clay/Silt gray-brown moist soft				
95	96	Cemented sand gravel				
96	98	Clay w/gravel gray-brown stiff				
98	100	Sand brown medium loose wet quartz/feldspar				
100	101	Clay w/silt				
101	110	Sand fine-very fine brown wet loose				
110	111	Silt gray-black dry-damp stiff				
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) <u>2/26/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> . This Water Well Record was completed on (mo/day/yr) <u>4/9/98</u> under the business name of <u>J S R Drilling Services, Inc.</u> by (signature) <u>Jan Carlson</u>						
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.						

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WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL:		Fraction	Section Number	Township Number	Range Number
County: <u>Doniphan</u>		<u>NE 1/4 SE 1/4 SW 1/4</u>	<u>33</u>	<u>T 03 S</u>	<u>R 20 E/W</u>
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>					
2 WATER WELL OWNER: <u>KDHE</u> RR#, St. Address, Box # : <u>Forbes Field, Building 740</u> Board of Agriculture, Division of Water Resources City, State, ZIP Code : <u>Topeka, KS 66620</u> Application Number:					
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: <u>135</u> ft. ELEVATION:			
		Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft.			
		WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr			
		Pump test data: Well water was ft. after hours pumping gpm			
		Est. Yield gpm: Well water was ft. after hours pumping gpm			
Bore Hole Diameter: <u>8</u> in. to ft., and in. to ft.		WELL WATER TO BE USED AS:			
1 Domestic		3 Feedlot	6 Oil field water supply	8 Air conditioning	11 Injection well
2 Irrigation		4 Industrial	7 Lawn and garden only	9 Dewatering	12 Other (Specify below)
				10 Monitoring well	<u>MW-06</u>
Was a chemical/bacteriological sample submitted to Department? Yes No; If yes, mo/day/yr sample was submitted					
Water Well Disinfected? Yes No					
5 TYPE OF BLANK CASING USED:					
1 Steel		3 RMP (SR)	6 Asbestos-Cement	9 Other (specify below)	Welded
2 PVC		4 ABS	7 Fiberglass		Threaded
Blank casing diameter: <u>2</u> in. to <u>11 1/2</u> in. Dia		CASING JOINTS: Glued Clamped Welded Threaded: <u>X</u>			
Casing height above land surface: <u>0</u> in., weight		lbs./ft. Wall thickness or gauge No. <u>Sch. 40</u>			
TYPE OF SCREEN OR PERFORATION MATERIAL:					
1 Steel		3 Stainless steel	5 Fiberglass	8 RMP (SR)	10 Asbestos-cement
2 Brass		4 Galvanized steel	6 Concrete tile	9 ABS	11 Other (specify)
SCREEN OR PERFORATION OPENINGS ARE:		12 None used (open hole)			
1 Continuous slot		3 Mill slot	5 Gauzed wrapped	8 Saw cut	11 None (open hole)
2 Louvered shutter		4 Key punched	6 Wire wrapped	9 Drilled holes	
7 Torch cut		10 Other (specify)			
SCREEN-PERFORATED INTERVALS: From <u>130</u> ft. to <u>145</u> ft., From ft. to ft.					
GRAVEL PACK INTERVALS: From <u>139</u> ft. to <u>111</u> ft., From ft. to ft.					
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other					
Grout Intervals: From <u>111</u> ft. to <u>0</u> ft., From ft. to ft.					
What is the nearest source of possible contamination:					
1 Septic tank		4 Lateral lines	7 Pit privy	10 Livestock pens	14 Abandoned water well
2 Sewer lines		5 Cess pool	8 Sewage lagoon	11 Fuel storage	15 Oil well/Gas well
3 Watertight sewer lines		6 Seepage pit	9 Feedyard	12 Fertilizer storage	16 Other (specify below)
13 Insecticide storage		How many feet?			
Direction from well?					
FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	1	Topsoil brown damp w/clay	132	133	XXXXXX
1	2.5	Clay w/silt brown moist soft	133	135	Limesone gravel
2.5	45	Clay gray red-brown moist			Shale gray damp to dry stiff
45	50	Silt w/clay gray red-brown wet firm			
50	75	Clay w/silt gray red-brown gravel			
75	77	Sand med brown wet loose quartz feldspar			
77	80	Silt w/clay brown moist/wet firm			
80	85	Sand med brown loose wet gravel			
85	91	Silt/clay gray red-brown damp stiff			
91	92	Sand fine brown loose wet quartz feldspar			
92	101	Silt gray/green wet soft			
101	102	Sand med wet gray loose			
102	116	Silt gray damp stiff trace clay sand			
116	117	Sand coarse gray wet loose quartz feldspar			
117	132	Silt w/clay gray damp stiff gravel			
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) <u>2/25/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> This Water Well Record was completed on (mo/day/yr) <u>4/10/98</u> under the business name of <u>J S R Drilling Services, Inc.</u> by (signature) <u>Jim Carlson</u>					
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WATER WELL RECORD Form WWC-5 KSA 82a-1212

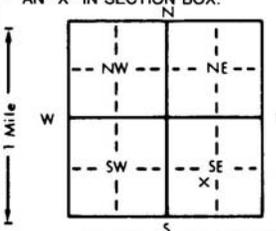
1 LOCATION OF WATER WELL:		Fraction	Section Number	Township Number	Range Number
County: <u>Doniphan</u>		<u>SW 1/4 SW 1/4 SE 1/4</u>	<u>33</u>	<u>T 13 S</u>	<u>R 20 BX</u>
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>					
2 WATER WELL OWNER: <u>KDHE</u>					
RR#, St. Address, Box # : <u>Forbes Field, Building 740</u>			Board of Agriculture, Division of Water Resources		
City, State, ZIP Code : <u>Topeka, KS 66620</u>			Application Number:		
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: <u>140</u> ft. ELEVATION:			
		Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft.			
		WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr			
		Pump test data: Well water was ft. after hours pumping gpm			
		Est. Yield gpm: Well water was ft. after hours pumping gpm			
Bore Hole Diameter in. to ft., and in. to ft.		WELL WATER TO BE USED AS:			
1 Domestic		3 Feedlot	6 Oil field water supply	9 Dewatering	12 Other (Specify below)
2 Irrigation		4 Industrial	7 Lawn and garden only	10 Monitoring well	<u>MW-07</u>
Was a chemical/bacteriological sample submitted to Department? Yes.....No.....; If yes, mo/day/yr sample was submitted					
Water Well Disinfected? Yes No					
5 TYPE OF BLANK CASING USED:					
1 Steel		3 RMP (SR)	5 Wrought iron	8 Concrete tile	CASING JOINTS: Glued Clamped
2 PVC		4 ABS	6 Asbestos-Cement	9 Other (specify below)	Welded
			7 Fiberglass		Threaded. <u>x</u>
Blank casing diameter in. to ft., Dia in. to ft., Dia in. to ft.					
Casing height above land surface in., weight lbs./ft. Wall thickness or gauge No. Sch. <u>40</u>					
TYPE OF SCREEN OR PERFORATION MATERIAL:					
1 Steel		3 Stainless steel	5 Fiberglass	8 RMP (SR)	10 Asbestos-cement
2 Brass		4 Galvanized steel	6 Concrete tile	9 ABS	12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE:					
1 Continuous slot		3 Mill slot	5 Gauzed wrapped	8 Saw cut	11 None (open hole)
2 Louvered shutter		4 Key punched	6 Wire wrapped	9 Drilled holes	
			7 Torch cut	10 Other (specify)	
SCREEN-PERFORATED INTERVALS: From ft. to ft., From ft. to ft.					
GRAVEL PACK INTERVALS: From ft. to ft., From ft. to ft.					
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other					
Grout Intervals: From ft. to ft., From ft. to ft., From ft. to ft.					
What is the nearest source of possible contamination:					
1 Septic tank		4 Lateral lines	7 Pit privy	10 Livestock pens	14 Abandoned water well
2 Sewer lines		5 Cess pool	8 Sewage lagoon	11 Fuel storage	15 Oil well/Gas well
3 Watertight sewer lines		6 Seepage pit	9 Feedyard	12 Fertilizer storage	16 Other (specify below)
				13 Insecticide storage	
Direction from well? How many feet?					
FROM	TO	LITHOLOGIC LOG	FROM	TO	Cont. XXXXXXXXXXXX
0	1	Asphalt, topsoil, clay w/silt	95	96	Sand brown fine grained wet
1	5	Clay w/silt brown damp plastic	96	101	Silt gray-blk damp gravel some sand
5	8	Silt w/some clay brown damp	101	103	Fine sand gray-blk wet clay gravel
8	11	Clay w/silt damp soft plastic	103	107	Silt gray-black damp stiff gravel
11	21	Clay w/silt gray red-brown streaks	107	109	Sand gray loose wet ctz feldspar
21	35	Clay gray-brown damp stiff carbon pcs	109	123	Silt gray damp sand stiff
35	54	Clay gray wet very stiff gravel	123	125	Gravel coarse sand loose wet shale
54	56	Clay w/silt firm brown-gray moist-wet	125	126	Sand fine grained gray wet loose
56	59	Silt w/clay brown moist caliche nodules			
59	63	Silt brown stiff moist gravel	126	127	Gravel coarse sand wet loose
63	66	Caliche layer Clay w/silt brown damp	127	140	Silt gray stiff dry-damp possible shale
66	70	Limestone gravel siltw/clay brown			
70	80	Silt w/limestone gravel clay gray			
80	88	Sand brown wet loose fine grained			
88	95	XXXXXXXXXXXX Silt gray-black stiff			
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) ... <u>2/20/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> This Water Well Record was completed on (mo/day/yr) . <u>4/13/98</u> under the business name of <u>J S R Drilling Services, Inc.</u> by (signature) <u>Jon Carlson</u>					
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WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL:		Fraction	Section Number	Township Number	Range Number
County: <u>Doniphan</u>		<u>SE 1/4 SW 1/4 SE 1/4</u>	<u>33</u>	<u>T 03 S</u>	<u>R 20 E/W</u>
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>					
2 WATER WELL OWNER: <u>KDHE</u>					
RR#, St. Address, Box # : <u>Forbed Field, Building 740</u>			Board of Agriculture, Division of Water Resources		
City, State, ZIP Code : <u>Topeka, KS 66620</u>			Application Number:		
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL: <u>122</u> ft. ELEVATION:			
		Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft.			
		WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr			
		Pump test data: Well water was ft. after hours pumping gpm			
		Est. Yield gpm: Well water was ft. after hours pumping gpm			
		Bore Hole Diameter in. to ft., and in. to ft.			
		WELL WATER TO BE USED AS:			
		5 Public water supply		8 Air conditioning	
		6 Oil field water supply		9 Dewatering	
		1 Domestic		10 Monitoring well <u>MW-QB</u>	
		3 Feedlot		11 Injection well	
		4 Industrial		12 Other (Specify below)	
		7 Lawn and garden only			
Was a chemical/bacteriological sample submitted to Department? Yes.....No.....; If yes, mo/day/yr sample was submitted					
Water Well Disinfected? Yes No					
5 TYPE OF BLANK CASING USED:					
1 Steel		3 RMP (SR)		5 Wrought iron	
2 PVC		4 ABS		6 Asbestos-Cement	
				7 Fiberglass	
Blank casing diameter in. to ft., Dia		106 ft., Dia		8 Concrete tile	
Casing height above land surface in., weight		lbs./ft. Wall thickness or gauge No. <u>Sch 40</u>		9 Other (specify below)	
TYPE OF SCREEN OR PERFORMANCE MATERIAL:					
1 Steel		3 Stainless steel		5 Fiberglass	
2 Brass		4 Galvanized steel		6 Concrete tile	
				7 Torch cut	
				8 RMP (SR)	
				9 ABS	
				10 Asbestos-cement	
				11 Other (specify)	
				12 None used (open hole)	
SCREEN OR PERFORMANCE OPENINGS ARE:					
1 Continuous slot		3 Mill slot		5 Gauzed wrapped	
2 Louvered shutter		4 Key punched		6 Wire wrapped	
				7 Torch cut	
				8 Saw cut	
				9 Drilled holes	
				10 Other (specify)	
				11 None (open hole)	
SCREEN-PERFORATED INTERVALS: From ft. to ft., From ft. to ft.					
GRAVEL PACK INTERVALS: From ft. to ft., From ft. to ft.					
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other					
Grout Intervals: From ft. to ft., From ft. to ft., From ft. to ft.					
What is the nearest source of possible contamination:					
1 Septic tank		4 Lateral lines		7 Pit privy	
2 Sewer lines		5 Cess pool		8 Sewage lagoon	
3 Watertight sewer lines		6 Seepage pit		9 Feedyard	
				10 Livestock pens	
				11 Fuel storage	
				12 Fertilizer storage	
				13 Insecticide storage	
				14 Abandoned water well	
				15 Oil well/Gas well	
				16 Other (specify below)	
Direction from well? How many feet?					
FROM	TO	LITHOLOGIC LOG	FROM	TO	Cont.
0	4	Topsoil clay w/some silt	116	120.5	Silt w/clay gray-blk dry to moist
4	15	Clay br-blk moist plastic	120.5	122	Shale gray weathered dry-damp
15	32.5	Clay gray-lt. brown damp stiff			
32.5	35	Silty clay orange-brown stiff plas.			
35	41.5	Clay some silt red-brown damp caliche			
41.5	46	Silt red-brown stiff damp caliche			
46	49	Silt w/some clay gray damp gravel			
49	65	Sand brown moist loose ctz feldspar			
65	71	Silt w/clay red-brown damp gravel/sand			
71	95	Shale black dry-damp sand layers 87'			
95	95	Gravelw/sand loose wet			
95	100.5	Silt some clay gray-blk stiff moist			
100.5	105	Gravel w/coarse sand gray-blk loose wet			
105	106	Clay w/silt gray-blk wet plastic			
106	116	Sand gray-blk fine grained wet silt			
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) <u>2/16/98</u> and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> This Water Well Record was completed on (mo/day/yr) .. <u>4/13/98</u> .. under the business name of <u>J & R Drilling Services, Inc.</u> by (signature) <u>Jan Carlson</u>					
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.					

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL: County: <u>Doniphan</u>	Fraction <u>NE 1/4 SW 1/4 SE 1/4</u>	Section Number <u>33</u>	Township Number <u>T 03 S</u>	Range Number <u>R 20 E W</u>
Distance and direction from nearest town or city street address of well if located within city? <u>Bendena, KS</u>				
2 WATER WELL OWNER: <u>KDHE</u> RR#, St. Address, Box #: <u>XXXXXXXXXXXX Forbes Field, Building 740</u> Board of Agriculture, Division of Water Resources City, State, ZIP Code: <u>Topeka, KS 66620</u> Application Number:				
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX: 		4 DEPTH OF COMPLETED WELL: <u>138</u> ft. ELEVATION: Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft. WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr Pump test data: Well water was ft. after hours pumping gpm Est. Yield gpm: Well water was ft. after hours pumping gpm Bore Hole Diameter <u>8</u> in. to ft., and in. to ft. WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well 1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below) 2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well <u>MW-090</u> Was a chemical/bacteriological sample submitted to Department? Yes.....No.....; If yes, mo/day/yr sample was submitted Water Well Disinfected? Yes No		
5 TYPE OF BLANK CASING USED: 1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped 2 PVC 4 ABS 6 Asbestos-Cement 9 Other (specify below) Welded 7 Fiberglass Threaded <u>X</u> Blank casing diameter <u>2</u> in. to <u>105</u> ft., Dia in. to ft., Dia in. to ft. Casing height above land surface <u>0</u> in., weight lbs./ft. Wall thickness or gauge No. <u>Sch. 40</u> TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 3 Stainless steel 5 Fiberglass 7 PVC 10 Asbestos-cement 2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 11 Other (specify) 9 ABS 12 None used (open hole) SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 3 Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole) 2 Louvered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes 7 Torch cut 10 Other (specify) SCREEN-PERFORATED INTERVALS: From <u>120</u> ft. to <u>105</u> ft., From ft. to ft. GRAVEL PACK INTERVALS: From <u>123</u> ft. to <u>102</u> ft., From ft. to ft. From ft. to ft., From ft. to ft.				
6 GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other Grout Intervals: From <u>138</u> ft. to <u>123</u> ft., From <u>102</u> ft. to <u>0</u> ft., From ft. to ft. What is the nearest source of possible contamination: 1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well 2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well 3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below) 13 Insecticide storage Direction from well? FROM TO LITHOLOGIC LOG FROM TO Cont. PERFORATION INTERVALS 0 1.5 Coal fragments anthracite 105 107 Fine sand brown wet coarse sand 1.5 6 Clay topsoil mixed w/coal 107 125 Silt some clay gray damp some sand 6 7.5 Clay tan red-brown moist soft 125 138 Silt coarse sand some gravel 7.5 8 Silt w/some clay dark brown damp 8 15 Clay minor silt lt. brown damp firm 15 45 Clay gray damp soft trace silt 45 60.5 Clay w/some silt gray damp redbrown 60.5 61 Sand med grain w/clay wet loose 61 68 Clay red-brown w/gray soft damp 68 70 Sand red-brown w/gray areas damp soft 70 80 Silt w/some clay damp limestone gravel 80 81 Sand med grain brown wet loose 81 85 Gravel w/sand red-brown wet gravel 85 90 Sand and gravel brown wet loose 90 105 Clay w/silt gray stiff damp				
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) ... <u>3/7/98</u> ... and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. <u>549</u> This Water Well Record was completed on (mo/day/yr) ... <u>4/13/98</u> ... under the business name of <u>J & R Drilling Services, Inc.</u> by (signature) <u>Jon Carlson</u>				
INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.				

OFFICE USE ONLY
T
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W
SEC.
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Supplement 1:

**Titles and Leases for the Former CCC/USDA Facility and
Adjacent Properties**

Titles

Town, now City of Wathena, that lies South of the County Road (sometimes erroneously described as being in Creal's Addition), Doniphan County, Kansas.

for the consideration of ONE HUNDRED DOLLARS and other valuable considerations.

DATED: October 22, 1986.

Wilma Williams
Wilma Williams, County Clerk
Doniphan County, Kansas

STATE OF KANSAS, COUNTY OF DONIPHAN, SS:

The above and foregoing instrument was executed and acknowledged before me this 22 day of October, 1986, by Wilma Williams, County Clerk of Doniphan County, Kansas.

Jacqueline Dawe
Notary Public

(SEAL)

Jacqueline Dawe
NOTARY PUBLIC
State of Kansas
My Appointment Expires ---
My Appointment Expires: 9-17-89

BOOK 179
pg 176

Filed for record the 17 day of December A.D. 1986 at 2:50 P.M.

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WARRANTY DEED

Doniphan County, Kansas, CONVEYS AND WARRANTS TO: James M. Stewart and Kenneth L. Stewart

All of Lots 1, 2, 3, 4, 21, 22, 23, and 24 in Block 190, in the Original Town, now City of Elwood, Doniphan County, Kansas,

for the consideration of ONE HUNDRED DOLLARS and other valuable considerations.

DATED: October 22, 1986.

Wilma Williams
Wilma Williams, County Clerk
Doniphan County, Kansas

STATE OF KANSAS, COUNTY OF DONIPHAN, SS:

The above and foregoing instrument was executed and acknowledged before me this 22 day of October, 1986, by Wilma Williams, County Clerk of Doniphan County, Kansas.

(SEAL)

Jacqueline Dawe
Notary Public

Jacqueline Dawe
NOTARY PUBLIC
State of Kansas
My Appointment Expires: 9-17-89

Filed for record the the 19 day of December A.D. 1986 at 10:50 A.M.

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WARRANTY DEED

Herbert W. Albers and Gladys L. Albers, his wife, CONVEY AND WARRANT TO: Paul C. Johnson and Mary Linn Johnson, his wife, as joint tenants with the right of survivorship and not as tenants in common,

A tract of land containing 1.74 acres, more or less, in the Southeast Quarter of Section 33, Township 3 South, Range 20 East of the 6th P.M., in Doniphan County, Kansas, described as follows: Commencing at the Southwest Corner of the Southeast Quarter of Section 33 aforesaid, thence North along the West line of said Southeast Quarter 903.81 feet to the North right-of-way line of the abandoned Chicago, Rock Island and Pacific Railroads and the TRUE POINT OF BEGINNING; thence continuing North along the West line of said Southeast Quarter 355 feet; thence East (N 90° 00' 00" E) 225 feet; thence South (S 0° 00' 00" E) 319.41 feet to intersect the North right-of-way line of the aforesaid railroad; thence westerly (S 81° 00' 40" W) along North line of said railroad right-of-way 227.80 feet to intersect the West line of the Southeast Quarter aforesaid and the true point of beginning, according to plat of survey thereof completed by Novak & Lay, Engineers/Surveyors, Hiawatha, Kansas, on August 27, 1986.

DEED RECORD NO. 179

Lockwood Co., Inc. Recorder No. 342178-3-88

for One Dollar (\$1.00) and other good and valuable considerations.

DATED: September 17, 1986.

Herbert W. Albers
Herbert W. Albers

Gladys L. Albers
Gladys L. Albers

STATE OF KANSAS, COUNTY OF DONIPHAN, SS:

The within and foregoing Warranty Deed was acknowledged before me on the 17th day of September, 1986, by Herbert W. Albers and Gladys L. Albers, his wife.

(SEAL)

Mary E. Dittmore
Mary E. Dittmore- Notary Public

My Appointment Expires: March 5, 1988

Filed for record the 19 day of December A.D. 1986 at 1:45 P.M.

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JOINT TENANCY WARRANTY DEED

Mark H. D. Clary, a single person CONVEYS AND WARRANTS TO Melvin H. Spiker and Norma F. Spiker, his wife as JOINT TENANTS and not as tenants in common, with full rights of survivorship, the whole estate to vest in the survivor in the event of the death of either, all the following described REAL ESTATE in the County of Doniphan and the State of Kansas, to-wit:

Lot 1 in Block 12 in the original town, now the City of Troy.

for the sum of one dollar and other valuable consideration.

EXCEPT AND SUBJECT TO: Easements of record

Dated December 17, 1986.

Mark H. D. Clary
Mark H. D. Clary

STATE OF KANSAS, Doniphan County, ss.

BE IT REMEMBERED, That on this 17th day of December A.D. 1986, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came Mark H. D. Clary, a single person who is personally known to me to be the same person who executed the within instrument of writing and such persons duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.

(SEAL)

Patricia J. Triplett
Notary Public

PATRICIA J. TRIPLETT
My Appt. Ex. 8-27-90
Term expires August 27, 1990

Filed for record the 19 day of December A.D. 1986 at 4:05 P.M.

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36-22 K 1876-01
F 092-5 (32)
C/A 1754

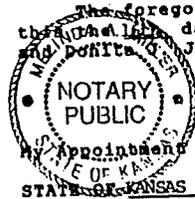
GENERAL WARRANTY DEED

THIS DEED, Made this 6th day of November 1986, between MARVIN HARRIS and DONNA EILENE HARRIS, husband and wife MURRY D. KYLE and MARY LEE KYLE, husband and wife of Doniphan County, in the State of Kansas, of the first part, and SECRETARY OF TRANSPORTATION OF THE STATE OF KANSAS of Shawnee County, in the State of Kansas, of the second part,

WITNESSETH, That parties of the first part, in consideration of the sum of \$1.00 ONE DOLLAR AND OTHER VALUABLE CONSIDERATIONS and NO/100 DOLLARS, the receipt of which is hereby acknowledged, do by these presents convey and warrant unto said party of the second part, its successors and assigns, all the following-described REAL ESTATE situated in the County of Doniphan and State of Kansas, to wit;

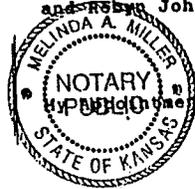
- (a) A tract of land in the Northeast Quarter of Section 14, Township 3 South, Range 20 East of the 6th P.M., described as follows: BEGINNING at the Northwest corner of said Quarter Section; First Course, thence North 88 degrees 29 minutes East on an assumed bearing along the North line of said Quarter Section to the East line of said Quarter Section; Second Course, thence South 01 degree 24 minutes East along said East line, 317.9 feet; Third Course, thence South 73 degrees 24 minutes West, 181.1 feet; Fourth Course, thence North 42 degrees 48 minutes West, 152.4 feet; Fifth Course, thence North 75 degrees 06 minutes West, 574.2 feet; Sixth Course, thence South 75

The foregoing instrument was acknowledged before me on the 16th day of February, 1993, by Douglas P. Johnson and Melinda A. Miller Johnson, husband and wife.
Melinda A. Miller
 Notary Public
 Appointment Expires: 12-16-94
 STATE OF KANSAS, COUNTY OF DONIPHAN, SS:



BOOK 193
 pg 73

The foregoing instrument was acknowledged before me on this the 16th day of February, 1993, by Craig S. Johnson and Melinda A. Miller Johnson, husband and wife.
Melinda A. Miller
 Notary Public
 Appointment Expires: 12-16-94



State of Kansas, Doniphan County SS.
 This instrument was filed for Record on the 16 day of April A.D. 1993 at 10:10 o'clock, AM and duly recorded in Book 193 on Page 72
Suzanne Houston
 REGISTER OF DEEDS
 Fee \$6.00 pd

WARRANTY DEED

Paul C. Johnson and Mary Linn Johnson, husband and wife,

CONVEY AND WARRANT TO: Johnson Farms, Inc. - Bendena, a Kansas Corporation,

The full fee simple title in and to the following described real estate situate in Doniphan County, Kansas, to wit:

A tract of land containing 1.74 acres, more or less, in the Southeast Quarter of Section 33, Township 3 South, Range 20 East of the 6th P.M., in Doniphan County, Kansas, described as follows: Commencing at the Southwest Corner of the Southeast Quarter of Section 33 aforesaid, thence North along the West line of said Southeast Quarter 903.81 feet to the North right-of-way line of the abandoned Chicago, Rock Island and Pacific Railroads and the TRUE POINT OF BEGINNING; thence continuing North along the West line of said Southeast Quarter 355 feet; thence East (N 90 degrees 00' 00"E) 225 feet; thence South (S 0 degrees 00' 00" E) 319.41 feet to intersect the North right-of-way line of the aforesaid railroad; thence westerly (S 81 degrees 00' 40"W) along North line of said railroad right-of-way 227.80 feet to intersect the West line of the Southeast Quarter aforesaid and the true point of beginning, according to plat of survey thereof completed by Novak & Lay, Engineers/Surveyors, Hiawatha, Kansas, on August 27, 1986;

for the consideration of ONE DOLLAR (\$1.00) and other valuable considerations.

DATED: Feb. 16, 1993.

Paul C. Johnson
 Paul C. Johnson

Mary Linn Johnson
 Mary Linn Johnson

Leases

WHEREAS, The Party of the First Part is the owner of a 35,000 gallon oil tank, situated underground on the following described real estate:

Beginning at a point on the West line of Eighth Street, and eight and five-tenths (8.5) feet distant northerly measured at right angles from the center line of Chicago, Rock Island and Pacific Railroad Company's passing track; thence westerly parallel with and eight and five-tenths (8.5) feet southerly one hundred fifty (150) feet; thence northerly at right angles one hundred eighteen (118) feet, more or less; thence easterly at right angles one hundred fifty (150) feet to a point on the West line of Eighth Street; thence southerly along said West line of Eighth Street one hundred eighteen (118) feet, more or less to the point of beginning, situated in the Town of Elwood, in the County of Doniphan and State of Kansas.

Whereas, the Party of the Second Part is desirous of leasing the above described property and oil tank, the Party of the First Part for and in consideration of One Dollar (\$1.00) and other valuable considerations to him paid by the Party of the Second Part, does lease to the Party of the Second Part said described property for a period of one year from the date of this lease.

It is hereby agreed by the Party of the First Part that the Party of the Second Part shall have the option to renew this lease at the expiration thereof for an additional period of one year.

Witness our hands this 17th day of May, 1954.

Cash Oil Company

By Bob Suttle
Party of the First Part

(CORP)
(SEAL)

Refiners Petroleum Company

by C. H. Saas, Secy
Party of the Second Part

STATE OF MISSOURI COUNTY OF BUCHANAN SS:

Subscribed and sworn to before me a Notary Public within and for the County of Buchanan, State of Missouri, this 26th day of May, 1954.

My Commission Expires May 7, 1955 (SEAL)

Claud W. Henry
Notary Public

Filed for record the 26 day of May A. D. 1954 at 2 P. M.

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURE STABILIZATION AND CONSERVATION
COMMODITY CREDIT CORPORATION

LEASE OF PROPERTY

THIS LEASE, made and entered into this 1st day of May, 1954, by and between W. C. Albers of Bendena, Kansas, Lessor, and Commodity Credit Corporation, Lessee.

WITNESSETH THAT:

1. The Lessor leases to the Lessee, and the Lessee hereby leases from the Lessor upon the terms and conditions hereinafter stated, the following described real estate (hereinafter called "property") situated in the County of Doniphan and state of Kansas:

Tract in SW $\frac{1}{4}$ 33-3-20
310' x 194'

containing 1 $\frac{1}{2}$ acres, more or less.

2. The term of the lease shall be for a period of 5 years, commencing the 1st day of May, 1954, and ending the 1st day of May, 1959, with the right of the Lessee, during such term or any extension thereof, to terminate said lease, and liability for any further rent, on the - day of May of any year, by giving 30 days' previous notice in writing to the Lessor.

Handwritten note:
This Commission expires May 7, 1955. I am a Notary Public for Buchanan County, Missouri. My commission expires May 7, 1955. I am a Notary Public for Buchanan County, Missouri. My commission expires May 7, 1955.

THE LOCKWOOD CO., ATCHISON, KANSAS 66002-28

3. As rent for said property, the Lessee shall pay the Lessor - Dollars (\$103.50) per year, such rent to be payable in advance, but to be apportionable in the event the lease is terminated as provided in paragraph 2 hereof:

4. The Lessor warrants that he is the owner of the property, has the right to give the Lessee possession under this lease, and will, so long as this lease remains in effect, warrant and defend the Lessee's possession against any and all persons whomsoever.

5. The Lessee shall have the right, during this lease, to erect storage structures, or facilities, make alterations, install scales, fences, or signs, in or upon the premises hereby leased and, at the expiration of said lease or any renewal or extension thereof or at any time this lease is in effect, may remove said storage structures, facilities, scales, fences, or signs or any part thereof, whether or not such structures, facilities, scales, fences or signs have become legally a fixture.

6. The Lessee shall not assign this lease without the written consent of the Lessor. The Lessee, may, however, sublet the structures on the premises leased hereunder, or any one or more of them for the term of the lease or any part thereof upon such terms and conditions as Lessee may wish to so sublet.

7. The Lessee, if required by the Lessor, shall upon the expiration of this lease, or renewal thereof, restore the premises to the same condition as that existing at the time of entering upon the same under this lease, reasonable and ordinary wear and tear and damages by the elements or by circumstances over which the Lessee has no control excepted: Provided, however, That if the Lessor requires such restoration, the Lessor shall give written notice thereof to the Lessee 30 days before the termination of the lease.

8. The Lessor grants and gives the Lessee the option as a consideration of this lease and for the further consideration of one dollar, the receipt of which is hereby acknowledged, to renew said lease for a period of 5 years from the Lessor, his heirs, executors, administrators, and assigns, for the sum of One Hundred three & 50/100 Dollars (\$103.50) per year.

9. (Marked out on original)

10. In the event any increased tax assessment is made against the Lessor or the property by virtue of the erection of storage structures and facilities thereon by the Lessee, the Lessor agrees to cooperate fully in any contest of such increased assessment which the Lessee feels should be made. The Lessee agrees that the rental hereunder shall be adjusted upward by the amount of any such increased tax assessment which the Lessor and Lessee mutually agree to be proper or which is determined to be legally valid in court proceedings.

11. No member of or Delegate to Congress or Resident Commissioner, shall be admitted to any share or part of this lease or purchase or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this lease or purchase if made with a corporation for its general benefit.

12. The Lessor warrants that he has not employed any person to solicit or secure this lease upon any agreement for a commission, percentage, brokerage, or contingent fee and that no such consideration or payment has been or will be made. Breach of this warranty shall give CCG the right to annul the lease, or, in its discretion, to deduct from the rental or purchase price the amount of such commission, percentage, brokerage or contingent fees. This warranty shall not apply to commissions payable by the Lessor if the lease is secured or made through a bona-fide agent maintained by the Lessor for the purpose of leasing or selling his property.

(Seal) W. C. Albers LESSOR

COMMODITY CREDIT CORPORATION, LESSEE

By L. H. Libel

(To be reproduced in ASC State Office)

Chairman, Doniphan County
ASC Committee

State of Kansas, Doniphan County, ss.

BE IT REMEMBERED, That on this 26th day of May A. D. 1954 before me, the undersigned, a Notary Public in and for the County and State aforesaid, came W. C. Albers to personally known to be the same person who executed the within instrument of writing, and such persons duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal, on the day and year last above written.

My Commission expires 5-23-54

(SEAL)

N. V. Wakeman
Notary Public

Filed for record the 26 day of May A. D. 1954 at 3:30 P. M.

recorded in Vol. S at Page 16 in the records of the Probate Court of Doniphan County, Kansas, that the said Katherine Theis owned a life estate in the following described real estate, to wit:

The East Half of the Northwest Quarter of the Northwest Quarter, except 20 feet for road way, and also the Northeast Quarter of the Southwest Quarter of the Northwest Quarter, except the East 20 feet, and also, the East 20 feet of the Northwest Quarter of the Southwest Quarter of the Northwest Quarter, all in Section 17, Township 3, Range 21, Doniphan County, Kansas.

Vernon B. Tibbetts
Vernon B. Tibbetts

STATE OF KANSAS DONIPHAN COUNTY SS:

Be it remembered that on this 17th day of April, 1959, before me the undersigned, a Notary Public in and for the County and State aforesaid came Vernon B. Tibbetts who is personally known to me to be the same person who signed the within and foregoing affidavit and who was then by me duly sworn as to the truth of the statements therein contained and who then duly acknowledged his execution of the same for the purposes and intents therein expressed.

In Witness Whereof I have hereunto placed my hand and notarial seal, the day and year last above stated.

Comm. Exp: Nov. 5, 1960

(SEAL)

Florence Edge
Notary Public Florence Edge

Filed for record the 17 day of April A. D. 1959 at 11:55 A. M.

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EXTENSION OF LEASE

EXHIBIT 1
(7-GR)

"This extension of Lease made and entered into this 28 day of April, 1959, by and between W. C. Albers, hereinafter called Lessor, and Commodity Credit Corporation, hereinafter called Lessee.

WITNESSETH

WHEREAS, The parties hereto have heretofore entered into a certain Lease dated May 1, 1954, wherein the Lessor leased to the Lessee the following described property.

Tract in the SW corner of the SW $\frac{1}{4}$ of 33-3-20 along road directly North of the Bendena Elevator 310'X 194'

for a term ending May 1, 1959, and

WHEREAS, it is desired by the parties hereto to extend the said lease for an additional term under the same terms and conditions:

NOW THEREFORE, It is mutually understood and agreed by and between the parties hereto as follows:

(1) The said Lease is hereby extended for an additional term beginning May 1, 1959 and ending May 1, 1964.

(2) Lessors Grant and give to the Lessee the option of further renewal of the lease for an additional period of five (5) years ending May 1, 1969 under the same terms and conditions of the lease as extended herein provided the Lessee gives the Lessors written notice to renew at least thirty (30) days prior to the time the lease, as extended, would otherwise expire.

IN WITNESS WHEREOF, THE parties hereto have executed this extension of Lease on the day first above written.

W. C. Albers
Lessor

Myrtle R. Albers
Lessor's Spouse

COMMODITY CREDIT CORPORATION

By Robt. A. Myers
Contracting officer
Robt. A. Myers

NOTE: It is necessary to have the above agreement acknowledged and recorded.

I, George D. Clark do hereby certify that W. C. Albers and Myrtle R. Albers, to me known to be the person (or Persons) who executed the foregoing instrument, personally appeared before me and acknowledged that he (she or they) executed the same as his (her or their) free act and deed and, in case said instrument was executed the same as his (her or their) free act and deed and, in case said instrument was executed on behalf of a corporation, that he (she or they) as

(Insert name of officer(s) and his (her or their) official title(s)

--- was (were) duly authorized by the Board of Directors of said
(Name of Corporation)

corporation to execute the said instrument on behalf of said corporation and to affix the corporate seal thereto.

Given under my official hand and seal this day of April 28, 1959,

My Commission Expires July 13, 1961.

(SEAL)

George D. Clark
Notary Public

Filed for record the 28 day of April A. D. 1959 at 1:45 P. M.

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LEASE

THIS LEASE, made and entered into this 24 day of April 1959, by and between Mr. E. M. Tucker & Mrs. B. A. Tucker, Husband & Wife, of Doniphan County, Kans. herein after called the Lessors, and the Geo. W. Kerford Quarry Co., a Delaware Corporation, 415 Utah, Atchison, Kansas, hereinafter called the Lessee.

WITNESSETH:

Lessors, for and in consideration of the sum of one dollar and other valuable considerations, receipt of which is hereby acknowledged, and of the covenants and agreements on the part of the Lessee hereinafter contained, hereby grant, demise, lease and let to said Lessee, for the purpose of exercising the exclusive right to mine, quarry and remove rock, to build roads and structures, and to erect such spoil banks as are reasonably necessary in the opinion of the Lessee to produce, save, and take care of said products, all that certain tract of Land described as follows, to wit:

Blocks 85, 86, 99, 100, 101, 102, 103, 104, 105, 106, 120, 121, 122, inclusive, all in the town site of Palermo, Doniphan County, Kansas.

The lessee shall pay to the Lessors, or their order, as full compensation for the rights and privileges herein granted, and, for all rock quarried and removed by the Lessee, a royalty of eight cents per ton for all rock quarried and disposed of by the Lessee off the premises. The amount of such royalty, to be paid by the Lessee, shall be determined by the duly authorized agents or inspectors of any government, person, corporation, or other parties, to whom any such rock may be sold or delivered, and, such measurements shall be conclusive upon the parties hereto in the computation of royalties payable hereunder. The Lessee shall make payment of the royalties, herein reserved, monthly, on or before the twenty-fifth day of each month for all rock quarried and removed from the premises during the preceding calendar month.

The Lessee shall have the right of ingress to and egress from the premises herein above described, for the conduct of quarry operations, and for the transportation of rock therefrom, with the right, at their option, to erect crushing equipment, to move in machinery and all equipment as found to be necessary for prosecution of business, to construct and operate a railroad spur track to the quarry, and, any such track, machinery, structures and improvements placed thereon by the Lessee, incident to such operations, shall remain personal property of the Lessee, and may be removed by the Lessee.

This lease shall commence on the 24th day of April, 1959, and shall continue for a period of one year. The Lessors expressly grant, to the Lessee, the right, privilege and option to renew and extend this lease and contract for -- successive additional periods of one year each. Said renewal option and privilege is to be considered as automatically exercised on each successive renewal date unless Lessee gives a thirty day notice, in writing, before the expiration of the then existing term, of its desire and intent to cancel, and, the giving of notice shall cancel this lease. The mailing of such notice by Registered United States Mail, to the Lessors, their successors or assigns, at the address last known to the Lessee, shall be sufficient notice hereunder.

Lessee shall indemnify and forever hold Lessors blameless for injuries or damages of any kind whatsoever, (but not to the leased premises), which may arise out of, in connection with, or, as a result of this lease or Lessee's operations on said premises under this lease, and, Lessee shall and covenants and agrees to maintain, at all times, during the life of this lease and contract, public liability insurance in amounts not less than \$100,000 dollars for personal injuries in any one accident, \$50,000 dollars for injury to any one person (including death,) and \$25,000 dollars for property damages.

Lessors hereby agrees and warrant that they have a good and valid title to the property herein described, and, that they will warrant and defend the same unto said Lessee, its heirs and assigns.

Lessors further agree that Lessee shall have the right, at any time, to redeem for Lessors, by payment of mortgages, taxes or other liens, on the above described land, in the event of default of payment by Lessors, and be subordinated to the rights of the holder thereof.

It is further agreed that during the term of this lease, there shall accrue, to the Lessors, a minimum annual royalty of \$100 dollars per year, which shall apply on earned royalty payments, when an as such royalty payments become due, and, all royalty payments, whether annual minimum or earned, shall be construed as

8. The Lessor grants and gives the Lessee the option as a consideration of this lease and for the further consideration of one dollar, the receipt of which is hereby acknowledged, to renew said lease for a period of 5 years from the Lessor, his heirs, executors, administrators, and assigns, for the sum of two hundred Dollars (\$200.00) per year.

9. Marked out

10. In the event any increased tax assessment is made against the Lessor or the property by virtue of the erection of storage structures and facilities thereon by the Lessee, the Lessor agrees to cooperate fully in any contest of such increased assessment which the Lessee feels should be made. The Lessee agrees that the rental hereunder shall be adjusted upward by the amount of any such increased tax assessment which the Lessor and Lessee mutually agree to be proper or which is determined to be legally valid in court proceedings.

11. No member of or Delegate to Congress or Resident Commissioner, shall be admitted to any share or part of this lease or purchase or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this lease or purchase if made with a corporation for its general benefit.

12. The Lessor warrants that he has not employed any person to solicit or secure this lease upon any agreement for a commission, percentage, brokerage, or contingent fee and that no such consideration or payment has been or will be made. Breach of this warranty shall give CCC the right to annul the lease, or, in its discretion, to deduct from the rental or purchase price the amount of such commission, percentage, brokerage, or contingent fees. This warranty shall not apply to commissions payable by the Lessor in the lease is secured or made through a bona-fide agent maintained by the Lessor for the purpose of leasing or selling his property.

(Seal) Fred B. Smith, LESSOR
Fred B. Smith

(Seal) Merle Smith, Lessor
Merle Smith

Loinel W. Sesna, Witness
Loinel W. Sesna

COMMODITY CREDIT CORPORATION, LESSEE

By Robt. A. Myers
Robt. A. Myers

Chairman, Doniphan ASC County Committee
Contracting Officer

I, Leroy Holder, do hereby certify that Fred B. Smith & Merle Smith, to me known to be the person (or persons) who executed the foregoing instrument, personally appeared before me and acknowledged that he (she or they) executed the same as his (her or their) free act and deed and, in case said instrument was executed on behalf of a corporation, that he (she or they) as Robt. A. Myers, Chairman (insert name of officer(s) and was (were) duly ASC County Committee his (her or their) official title(s) (Name of Corporation) authorized by the Board of Directors of said corporation to execute the said instrument on behalf of said corporation and to affix the corporate seal thereto.

Given under my official hand and seal this day of July 26, 1963.

My commission expires December 4, 1964 (SEAL) Leroy Holder
Notary Public, Leroy Holder

Filed for record the 29 day of July A. D. 1963 at 4:45 P. M.

KANSAS
FORM K-1-BI-3

EXTENSION OF LEASE

"This Extension of Lease made and entered into this 22 day of July, 1963 by and between W. C. Albers, hereinafter called Lessor, and Commodity Credit Corporation, hereinafter called Lessee.

WITNESSETH, Whereas, the parties hereto have heretofore entered into a certain lease dated May 1, 1954, wherein the Lessor leased to the Lessee the following described property:

Tract in the SW corner of the SW $\frac{1}{4}$ of Sec. 33-3-20 along road directly North of the Bendena Elevator 310' X 194'

For a term ending May 1, 1959, and

Whereas, it is desired by the parties hereto to extend the said lease for an additional term under the same terms and conditions:

THE LOCKWOOD CO., ATCHISON, KANSAS 67701-00-00

Now therefore, it is mutually understood and agreed by and between the parties hereto as follows:

(1) The said lease is hereby extended for an additional term beginning May 1, 1964, and ending May 1, 1969.

(2) Lessors grant and give to the Lessee the option of further renewal of the lease for an additional period of five (5) years ending May 1, 1974, under the same terms and conditions of the lease as extended herein provided the lessee gives the Lessors written notice to renew at least thirty (30) days prior to the time the lease, as extended, would otherwise expire.

In witness whereof, the parties hereto have executed this Extension of Lease on the day first above written.

W. C. Albers
W. C. Albers Lessor
Myrtle Albers
Lessor's Spouse, Myrtle Albers

COMMODITY CREDIT CORPORATION
By Robt. A. Myers
Contracting Officer, Robt. A. Myers

I, Edward Swinford, do hereby certify that W. C. Albers & Myrtle Albers, to me known to be the person (or persons) who executed the foregoing instrument, personally appeared before me and acknowledged that he (she or they) executed the same as his (her or their) free act and deed and, in case said instrument was executed the same as his (her or their) free act and deed and, in case said instrument was executed on behalf of a corporation, that he (she or they) as Robt. A. Myers

(Insert name of Officer(s))
Chairman ASC County Committee was duly authorized and his (her or their) official title(s) (Name of Corporation) by the Board of Directors of said corporation to execute the said instrument on behalf of said corporation and to affix the corporate seal thereto.

Given under my official hand and seal this day of July 22, 1963, my commission expires Jan. 26, 1967

3-1-63

(SEAL)

Edward Swinford
Notary Public, Edward Swinford

Filed for record the 29 day of July A. D. 1963 at 4:45 P. M.

KANSAS
FORM K-1-BI-3

EXTENSION OF LEASE

"This Extension of Lease made and entered into this 25 day of July, 1963 by and between Ralph C. Moser, hereinafter called Lessor, and Commodity Credit Corporation, hereinafter called Lessee.

WITNESSETH. Whereas, the parties hereto have heretofore entered into a certain lease dated Sept. 16, 1954, wherein the Lessor leased to the Lessee the following described property:

Approximately 56,000 square feet. A strip 160 feet wide on the West side, SE $\frac{1}{4}$ of Sec. 19-3-21, containing 1.3 acres, more or less.

For a term ending October 1, 1959, and

Whereas, it is desired by the parties hereto to extend the said lease for an additional term under the same terms and conditions:

Now therefore, it is mutually understood and agreed by and between the parties hereto as follows:

(1) The said lease is hereby extended for an additional term beginning October 1, 1964, and ending October 1, 1969

(2) Lessors grant and give to the Lessee the option of further renewal of the lease for an additional period of five (5) years ending October 1, 1974, under the same terms and conditions of the lease as extended herein provided the Lessee gives the Lessors written notice to renew at least thirty (30) days prior to the time the lease, as extended, would otherwise expire.

In witness whereof, the parties hereto have executed this Extension of Lease on the day first above written.

Ralph C. Moser
Ralph C. Moser, Lessor
Mrs. Ralph C. Moser
Mrs. Ralph C. Moser, Lessor's Spouse

COMMODITY CREDIT CORPORATION
By Robt. A. Myers
Contracting Officer, Robt. A. Myers

DECLARATION OF EXPIRATION OF MINERAL RESERVATION

KNOW ALL MEN BY THESE PRESENTS: That Whereas in that certain special warranty deed dated the 30th day of December, A.D. 1947, Between The Federal Land Bank of Wichita, Wichita, Kansas, a corporation, as First Party, and Amor & Hattie E. Schaffler, H&W, Troy, Kans., as Second Party(s), there was excepted and reserved unto the First Party an interest in the minerals in, upon and under the following described real estate situated in the County of Doniphan and State of Kans., to-wit:

Twp 2 South, Rge 21 East
Section 30: South 50 acres of the NE 1/4

to which deed reference is hereby made for a more particular description of the interest in the minerals so reserved.

NOW, THEREFORE, the First Party states that there was no production of minerals from said premises and that the premises were not being developed or operated at the end of the primary term of said reservation, and that such reservation has expired and is of no further force and effect.

WITNESS the signature of the Bank this 3rd day of March, 1969.

THE FEDERAL LAND BANK OF WICHITA,
Wichita, Kansas, a corporation,

(CORP SEAL)

By F.L. Buellesfeld
F.L. Buellesfeld, Vice President

ATTEST:

Byron T. Rowell
Byron T. Rowell, Assistant Secretary

ACKNOWLEDGMENT

STATE OF KANSAS
SS.
COUNTY OF SEDGWICK

Before me, the undersigned, a Notary Public in and for said County and State, on this 3rd day of March, 1969, personally appeared F.L. Buellesfeld, to me personally known and known to me to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its Vice President, and he being by me duly sworn did say that he is such officer and that the seal affixed to said instrument is the corporate seal of said corporation and that the same was signed and sealed in behalf of said corporation by authority of its board of directors, and he acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes set forth and specified therein.

WITNESS my hand and seal the day and year last above written.

(SEAL)

Joyce Youngers
Joyce Youngers, Notary Public

My commission expires: 4-2-72

Filed for record the 17 day of March A.D. 1969 at 9 A.M.

KANSAS
FORM K-1-BI-3

EXTENSION OF LEASE

THIS EXTENSION OF LEASE made and entered into this 13 day of March, 1969, by and between W.C. Albers Estate, Herbert W. Albers, Executor, hereinafter called Lessor, and Commodity Credit Corporation, hereinafter called Lessee. WITNESSETH

WHEREAS, the parties hereto have heretofore entered into a certain lease dated May 1, 1954, wherein the Lessor leased to the Lessee the following described property: (Enter legal description of the property)

Tract in the SW corner of the SW 1/4 of Sec. 33-3-20
along road directly North of the Bendena Elevator
310' X 194'

for a term ending April 30, 1974, and

WHEREAS, it is desired by the parties hereto to extend the said lease for an additional term under the same terms and conditions:

NOW, THEREFORE, it is mutually understood and agreed by and between the parties hereto as follows:

- (1) The said lease is hereby extended for an additional term beginning May 1, 1969, and ending April 30, 1974.
- (2) Lessors grant and give to the Lessee the option of further renewal of the lease for an additional period of five (5) years ending April 30, 1979, under the same terms and conditions of the lease as extended herein provided the Lessee gives the Lessors written notice to renew at least thirty (30) days prior to the time the lease, as extended, would otherwise expire.

IN WITNESS WHEREOF, the parties hereto have executed this Extension of Lease on the day first above written.

W. C. Albers Estate

(Lessor's Spouse)

Herbert W. Albers, Executor
(Lessor) Herbert W. Albers,
Executor

COMMODITY CREDIT CORPORATION

By Robert A. Myers
Chairman Doniphan ASC County
Committee, Robert A. Myers

ACKNOWLEDGMENT

I, Hillman Hull, do hereby certify that Herbert W. Albers, to me known to be the person who executed the foregoing instrument, personally appeared before me and acknowledged that he executed the same as his free act and deed and, in case said instrument was executed the same as his free act and deed and, in case said instrument was executed on behalf of a corporation, that he (she or they) as Robert A. Myers, Chairman Doniphan ASC County Committee (Insert name of officer(s) and his (her or their) official title(s)(Name of Corporation) was duly authorized by the Board of Directors of said corporation to execute the said instrument on behalf of said corporation and to affix the corporate seal thereto.

Given under my official hand and seal this day of 13th of March, 1969,

(SEAL)

Hillman Hull
Notary Public
Hillman Hull
Troy, Kansas 66087

My Commission expires October 12, 1972

Filed for record the 18 day of March A.D. 1969 at 9 A.M.

DEED

THIS DEED, Made this 21st day of February, 1969, between UNION PACIFIC RAILROAD COMPANY, a corporation of the State of Utah, party of the first part, and CITY OF ELWOOD, a municipal corporation of the State of Kansas, party of the second part:

WITNESSETH, That

WHEREAS, the party of the second part desires to acquire an easement for street purposes, over, upon and along, and for the construction, maintenance and operation of water and sewer lines and other public utilities under the surface of, the property hereinafter described; and

WHEREAS, the party of the first part is willing to donate said easement to the party of the second part for the purposes aforesaid;

NOW, THEREFORE, in consideration of the premises, the said party of the first part does by these presents grant, donate, convey and confirm unto the said party of the second part, and unto its successors and assigns, a PERPETUAL EASEMENT, for the purposes aforesaid, over, upon, along and under the surface of the property of the party of the first part in the County of Doniphan, State of Kansas, described as follows, to wit:

The south 66 feet of the N 1/2 NE 1/4, Section 36 Township 3 South, Range 22 East of the Sixth Principal Meridian, Doniphan County, Kansas, except the west 460 feet thereof.

RESERVING, however, to the party of the first part, its successors and assigns, the right to construct at any and all times and to maintain railroad tracks, pipe lines and telephone and telegraph and electric power pole and wire lines over, under and across (but in such a way as not unreasonably to interfere with) said street, water and sewer lines or other public utilities in the location above described, it being understood that the right so reserved to the party of the first part, its successors and assigns, is retained along with the general right of the party of the first part, its successors and assigns, to the use of the premises herein described for any purpose not inconsistent with the use by the party of the second part of said easement for the purposes herein defined.

This easement is made subject to all outstanding superior rights, including those for highways and other roadways and rights of way for irrigation and drainage ditches, pipe lines, pole and wire lines, and the right of renewals and extensions of the same.

DISCLAIMER AND DISCHARGE OF LEASE

WHEREAS, Commodity Credit Corporation, hereinafter called "CCC," as the lessee, leased from W. C. Albers, as lessor, pursuant to an instrument dated May 1, 1954, hereinafter called "the lease," a tract of real estate located in Doniphan County, Kansas that was erroneously described in the lease as follows:

Tract in SW 1/4, 33-3-20
310' x 194' containing 1 1/2 acres, more or less;

AND WHEREAS, the lease was recorded in the office of the Register of Deeds of Doniphan County, Kansas, in Book 133 on page 557 and was extended and renewed from time to time as shown by instruments recorded in the office of the Register of Deeds of Doniphan County, Kansas, in Book 137 on page 466, in Book 144 on page 574, and in Book 152 on page 487; and

WHEREAS, the tract of land leased by CCC was erroneously described in the lease and all extensions and renewals thereof, and said tract should have been described in the lease and all extensions and renewals thereof as follows:

Tract in the Southwest Quarter of the
Southeast Quarter of Section 33-3-20
along the road directly north of the
Bendena Elevator consisting of a tract
measuring 310 feet by 194 feet and con-
taining 1 1/2 acres, more or less;

AND WHEREAS, the lease and all extensions and renewals thereof have been terminated and are of no force and effect and same should be released and discharged.

NOW THEREFORE, Commodity Credit Corporation disclaims, releases, and discharges any and all interest in the real estate located in the State of Kansas and in Doniphan County, which it acquired under the lease and the extensions and renewals thereof, pursuant to instruments recorded in the records of Doniphan County, Kansas in Book 133 on page 557, in Book 137 on page 466, in Book 144 on page 574, and in Book 152 on page 487. This instrument is executed on behalf of CCC pursuant to delegation of authority published in the Federal Register (26 FR 3900).

COMMODITY CREDIT CORPORATION

By: Frank A. Mosier
State Executive Director
Kansas State ASCS Office

ACKNOWLEDGMENT

STATE OF KANSAS)
) SS.
COUNTY OF RILEY)

On this 19 day of Oct, 1973, before me, the undersigned Notary Public in and for the county and state aforesaid, personally appeared Frank A. Mosier, State Executive Director, Agricultural Stabilization and Conservation Service, United States Department of Agriculture, who is personally known to me and personally known to be such State Executive Director, and the same person who executed the within and foregoing instrument, and he duly acknowledged the execution of the same for and on behalf of and as the free act and deed of Commodity Credit Corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

(SEAL)

Corrine L. Kanode
Notary Public

CORRINE L. KANODE
NOTARY PUBLIC
Riley County, Kansas
My Commission Expires
January 19, 1976

My commission expires Jan 19, 1976

Filed for record the 24 day of October A.D. 1973 at 9:00 A.M.

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ADDENDUM TO LEASE

~~The existing Lease dated August 31, 1972, between the undersigned Lessor and Lessee is hereby amended to include the following additional paragraphs:~~

~~1. To secure certain borrowings, Lessee may mortgage its leasehold interest hereunder by mortgage or deed of trust to Continental Illinois National Bank and Trust Company of Chicago or its nominee (the "Continental Bank"). In the event of any default by Lessee in the performance of any of its obligations hereunder, Lessor will give written notice to the Continental Bank at the following address:~~

~~Continental Illinois National Bank and
Trust Company of Chicago 231 South
LaSalle Street~~

Railroad Right-of-Way Abandonment

171/327

Commencing one thousand forty-one and eighty hundredths feet North of the Southwest Corner of the Southeast Quarter of Section Twenty-three (23), Township Two (2) South, Range Nineteen (19) East to a point on the centerline of U.S. 36 Highway; running thence easterly along the centerline of U.S. 36 Highway a distance of one thousand two hundred seventy-one and thirty hundredths feet to a point; Thence South at right angles to the centerline of the U.S. 36 Highway sixty feet to the South right-of-way line of said highway for a point of beginning:

Thence on an angle of 3° to the left three hundred fifty feet to a half inch iron bar; Thence on an angle of 17° 20' to the left one hundred sixty-five feet to a half inch iron bar; Thence on an angle of 73° 20' to the left three hundred fifty feet to a half inch iron bar; Thence northerly on an interior angle of 95° 00', four hundred thirty-two and fifteen hundredths feet to the South right-of-way line of said U.S. Highway 36; Thence westerly two hundred two feet along said South right-of-way line to a spike and a washer; Thence northerly at an exterior angle of 89° 28', sixty feet along said right-of-way line; Thence westerly along said right-of-way line two hundred thirty-one and forty hundredths feet to the point of beginning.

for the sum of One Dollar (\$1.00) and other good and valuable consideration.

EXCEPT AND SUBJECT TO: Grantor John S. May, by a special warranty above, releases his lien on the money judgment obtained for his client in Case No. 77 C 68 in the District Court of Doniphan County, Kansas, which was later converted by Sheriff's Sale to an interest in the real estate above described, upon the condition that such lien immediately attach to the proceeds of this conveyance. This special warranty is also expressly limited to the warranty that grantors have not permitted or allowed any other encumbrance to affect the title now held by Bill N. Glenn as receiver of The Industrial Loan and Investment Company of Sedalia, Missouri during the time that grantors may have had an interest in the above real estate.

Dated December 1, 1981

John S. May
JOHN S. MAY
JoAnn L. May
JOANN L. MAY

STATE OF KANSAS, Atchison COUNTY, ss

BE IT REMEMBERED, That on this 1st day of December A.D. 1981, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came John S. May and JoAnn L. May, his wife who are personally known to me to be the same persons who executed the within instrument of writing and such persons duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.

(SEAL)

Amelia R. Ostergard
AMELIA R. OSTERGARD Notary Public

AMELIA R. OSTERGARD
Atchison County, Ks.
My Appt. Exp. July 16, 1982

Filed for record the 7 day of January A.D. 1982 at 3:45 P.M.

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QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS That WILLIAM M. GIBBONS, Trustee of the Property of the CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, Debtor, as Trustee and not as an individual Grantor herein, pursuant to Court Order No. 234, dated May 5, 1980, entered by the United States District Court for the Northern District of Illinois, Eastern Division, in the matter of the Chicago, Rock Island and Pacific Railroad Company, Debtor, No. 75 B 2697, and pursuant to every other power and authority to him pertaining, in consideration of the sum of TEN DOLLARS (\$10.00) and other good and valuable consideration, the receipt whereof is hereby acknowledged, does hereby QUITCLAIM and CONVEY subject to the reservations and exceptions hereinafter set forth, unto EDWIN DENNIS FORD and CAROLYN KAY FORD as Tenants in Common, herein designated as "Grantee," all of Grantor's right, title and interest, estate, claim and demand, if any, in the following described parcel of land situated in the County of Doniphan, State of Kansas, to wit:

Being a rectangular tract of land lying and located in the West Half of the Southeast Quarter of Section 33, Township 3 South, Range 20 East, Doniphan County, Kansas, more particularly described as follows:

Commencing at the southwest corner of the Southeast Quarter of Section 33; thence North 90° East along the south line of

said section for a distance of 30 feet, more or less, to a point; thence North 0° East for a distance of 1,015 feet, more or less, to a point on Grantor's southerly right-of-way line as is presently evidenced, monumented, or recorded in Bendena, the POINT OF BEGINNING; thence North 81° 30' East, more or less, along Grantor's southerly right-of-way line for a distance of 440 feet, more or less, to a point; thence North 0° East for a distance of 175 feet, more or less, to a point; thence South 81° 30' West, more or less, and parallel with the centerline of Grantor's track for a distance of 440 feet, more or less; thence South 0° East for a distance of 175 feet, more or less, to the POINT OF BEGINNING; said parcel being the west 440 feet of that interest granted to the C.K. & N. Railway Company by John Albers and Wife, by deed recorded in Book 21, Page 352, and a 25-foot strip of land adjoining said west 440 feet, being the south 25 feet of that interest granted to the C.K. & N. Railway Company by John Albers and Wife by deed recorded in Book 21, Page 410, said parcel containing 1.77 acres, more or less.

The Grantor reserves unto himself, his successors and assigns, all of the coal, oil, gas, casinghead gas, lignite, sulphur, water and all other ores and minerals of every kind and nature in addition to the foregoing, underlying the surface of the property herein described, together with the full right, privilege and license at any and all times to explore or drill for and to protect, conserve, mine, take, extract, remove and market any and all such products.

The Grantor reserves for himself, his successors and assigns, an easement for the continued maintenance, operation and use of all existing driveways, roads, conduits, sewers, water mains, gas lines, electric power lines, communication lines, wires and other utilities and easements of any kind whatsoever on said premises, whether or not of record, whether owned, operated, used or maintained by Grantor, the Grantor's licensees or others, with the reasonable right of entry for the purpose of repairing, reconstructing and replacing same; and the Grantor further reserves unto himself, his successors and assigns, the right and privilege to convert existing licenses, leases and agreements, for driveways, roads, conduits, sewers, water mains, gas lines, electric power lines, wire and other utilities to permanent easements by issuance of a suitable grant in recordable form.

The Grantor reserves for himself, his successors and assigns, a perpetual easement on, over and across that portion of the property represented by hatched lines and designated "Right-of-Way Easement" on Exhibit "A" dated October 28, 1981, attached hereto and by reference made a part hereof, including, but not limited to, the right to maintain, repair, renew use and operate any track or tracks and appurtenances now existing upon or across the property herein described and to construct, maintain, repair, renew, use and operate any additional track or tracks and appurtenances across the property herein described, and also the right to install, maintain, use and operate wires or cables, together with poles or other structures supporting the same above the surface of said property, or pipes or conduits or other structures beneath the surface of the property.

The Grantee, its successors and assigns, covenant and agree that it shall neither do nor cause to be done any act that will unreasonably impede the flow of drainage water over the property herein described so as to adversely affect rail operations. This covenant shall in no way be construed to prohibit the Grantee from erecting buildings or other improvements on the property herein described, provided that the drainage equivalent to that existing at the time of this conveyance is maintained, whether naturally or by other means. This covenant shall run with the land and be binding upon the Grantee, its successors and assigns.

The Grantor further reserves unto himself, his successors, grantees and assigns, exclusive perpetual easements for the installation, maintenance and use of pipelines, telephone, radio, radar or laser transmission systems, wires, fibers, conduits, utility and energy transmission lines of every kind and character with all necessary supporting structures and devices which may be constructed or installed on, under, over, across and along any portion of the property herein described lying within fifty feet of the centerline of the main railroad tracks as now existing and represented on Exhibit "A" dated October 28, 1981. Such installation, maintenance and use shall not interfere with the Grantee's use of the surface. The failure of Grantor, his successors, grantees or assignees to exercise easement rights hereby reserved prior to January 1, 1991 shall in no event be construed to be a nonuser causing said easements to terminate, but if Grantor shall fail to convey or assign to others the easement rights hereby reserved by January 1, 1991, then the easements reserved in this paragraph shall automatically cease and determine.

Notwithstanding any other provision of this instrument, the Grantor shall in no event incur liability to the Grantee for failure of or defect in the title or estate of the Grantor in and to the property herein described.

This conveyance is made pursuant to the terms of a Purchase Agreement dated September 1, 1981 and the terms thereof shall survive delivery of this Quitclaim Deed.

IN WITNESS WHEREOF, this instrument is executed by the Grantor this 30 day of October, 1981.

WILLIAM M. GIBBONS, Trustee of the Property
of the CHICAGO, ROCK ISLAND AND PACIFIC
RAILROAD COMPANY, Debtor

William M. Gibbons
Trustee

WITNESS:

Tricia Lee Brown
Title and Closing Officer

APPROVED

K. B. Nelson
General Attorney

STATE OF ILLINOIS)
)SS
COUNTY OF COOK)

On this 30 day of October, A.D., 1981, before me, the undersigned, a Notary Public in and for said County, in said State, personally appeared WILLIAM M. GIBBONS, Trustee as aforesaid, to me known to be the identical person named in and who executed the foregoing instrument and acknowledged he executed same as his voluntary act and deed.

(SEAL)

Mary C. Peloso
Notary Public

My Commission Expires: May 22, 1984

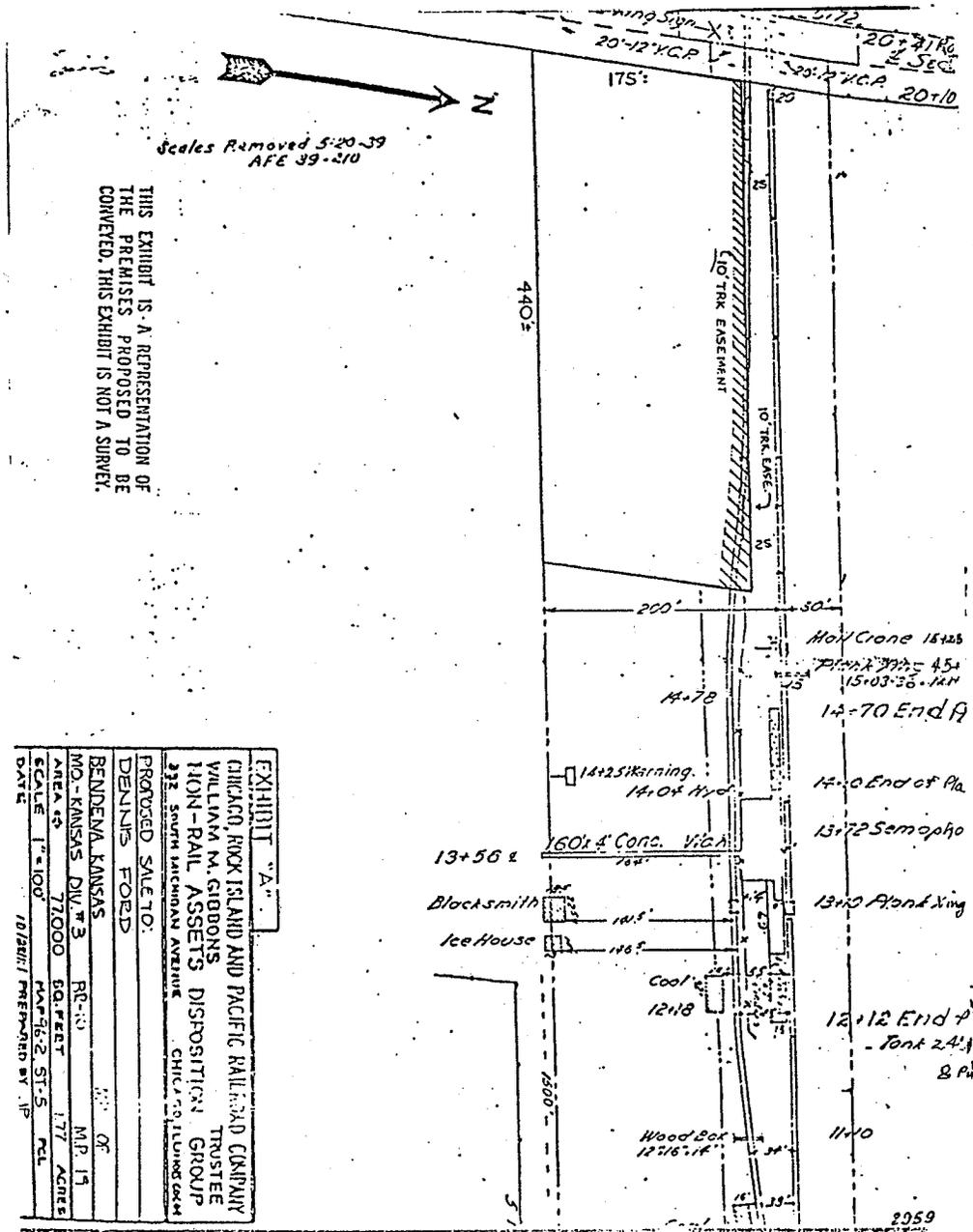


EXHIBIT "A"
CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY
WILLIAM M. GIBBONS
TRUSTEE
NON-RAIL ASSETS DISPOSITION GROUP
332 SOUTH MICHIGAN AVENUE CHICAGO, ILLINOIS 60604
PROPOSED SALETOR:
DENNIS FORD
BENDENA KANSAS
MO.-KANSAS DIV. 3
RC-30
MP 19
77000
50 FEET
177 ACRES
SCALE 1"=100'
DATE 10/28/81 PREPARED BY J.P.

Filed for record the 13 day of January A.D. 1982 at 12:45 P.M.

This Indenture, Made this Eight day of December A. D. 1896, between John Albers and Rosa Albers his wife

of Douglas County, in the State of Kansas of the first part, and The Chicago, Kansas and Nebraska Rail way Company a corporation organized under the Laws of the State of Kansas of Douglas County, in the State of Kansas of the second part:

Witnesseth, That said parties of the first part, in consideration of the sum of One AND 100 DOLLARS,

the receipt of which is hereby acknowledged, do by these presents, grant, bargain, sell, and convey unto said party of the second part, the hereunto heirs and assigns, all the following described REAL ESTATE, situated in the County of Douglas, and State of Kansas to-wit: A Strip of land bounded as follows: Commencing at the East Side of the Public road on the West Side of the South East quarter of Section 11 Township 23 North of Range 12 West one east fifty feet East of the Center line of the Chicago, Kansas and Nebraska Rail way as now located and continued through said premises and running thence South along the East line of said road one hundred and fifty (150) feet thence eastwardly parallel with and two hundred (200) feet from the Center line of said Rail way Fifty hundred (1000) feet and thence Northwardly at right angles to the said Center line one hundred and fifty (150) feet to the South line of the right of way of said Rail way thence Westward along South line of said right of way to the point of beginning. Said Rail way Company agrees, construct and maintain a depot upon said premises with a side track adjacent thereto.

To Have and to Hold the Same, Together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging, or in any wise appertaining, forever: And said John Albers

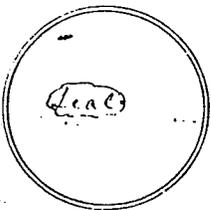
for himself, his heirs executors, or administrators, do hereby covenant, promise, and agree, to and with said party of the second part, that at the delivery of these presents he is lawfully seized in his own right, of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the above granted and described premises, with the appurtenances; that the same are free, clear, discharged, and unincumbered, of and from all former and other grants, titles, charges, estates, judgments, taxes, assessments and incumbrances, of what nature or kind soever; of any incumbrances claim or claims by him or those under whom he claims

and that he will WARRANT AND FOREVER DEFEND the same unto said party of the second part, his heirs and assigns, against said party of the first part, his heirs, and all and every person or persons whomsoever, lawfully claiming or to claim the same.

In Witness Whereof, The said parties of the first part have hereunto set their hands the day and year first above written. John Albers Rosa Albers

State of Kansas, Douglas County, ss: Be it Remembered, That on this Eight day of December A. D. 1896, before me the undersigned, a Notary Public in and for the County and State aforesaid, came John Albers and Rosa Albers his wife

who are personally known to me to be the same persons who executed the within instrument of writing, and such persons duly acknowledged the execution of the same.



In Testimony Whereof, I have hereunto set my hand, and affixed my Notarial seal, the day and year last above written. D. McIntosh, Notary Public

State of Kansas, Douglas County, ss: Notary Public, Term Expires July 10 1897 I hereby certify the foregoing to be a full, true and perfect copy of the original instrument which was filed with me for record on the 11 day of December A. D. 1896, at 6 o'clock P. M. Joseph H. Mansfield

This Indenture, Made this 25th day of May A. D. 1886, between

John Albers and Rosa Albers
Husband and Wife

of Douglas County, in the State of Kansas, of the first part, and
The Chicago, Kansas and Nebraska Railway Company a Corporation Organized under the laws
of the State of Kansas, of the second part:

Witnesseth, That said part 1st of the first part, in consideration of the sum of
Fourteen Hundred Fifty Four (\$1454.⁰⁰) AND ¹⁰⁰ X¹⁰⁰ DOLLARS,

the receipt of which is hereby acknowledged, do by these presents, grant, bargain, sell, and convey unto said party of the second part, its Successors
heirs and assigns, all the following described REAL ESTATE, situated in the County of Douglas, and State of Kansas to-wit:

A strip of land through the North West quarter of section six (6) in Township four (4)
of Range twenty (20) E. 6th P. M. One hundred and fifty feet in width being seventy -
five feet in width on each side of the center line of the railway of said second party
as located by its Engineers and by them marked and staked on said premises
Also a strip of land through the South East quarter of section thirty three (33) in Township
three (3) of Range twenty (20) E. 6th P. M. One hundred feet in width being fifty feet
in width on each side of the center line of the Railway of said second party, as located
by its Engineers and by them marked and staked on said premises -

To Have and to Hold the Same, Together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging, or in
any wise appertaining, forever: And said Parties of the first part

for themselves, their heirs
executors, or administrators, do hereby covenant, promise, and agree, to and with said party of the second part, that at the delivery of these presents
they are lawfully seized in their own right, of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the
above granted and described premises, with the appurtenances; that the same are free, clear, discharge, and unincumbered, of and from all former and other

of any incumbrances done or suffered by them or those under whom they claim

and that they will WARRANT AND FOREVER DEFEND the same unto said party of the second part, its Successors and assigns, against
said part 1st of the first part, their heirs, and all and every person or persons whomsoever, lawfully claiming or to claim the same.

In Witness Whereof, The said part 1st of the first part have hereunto set their hand the day and year first above written.

John Albers
Rosa Albers.

State of Kansas, Douglas County, ss:

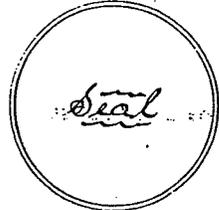
Be it Remembered, That on this 25th day of May A. D. 1886, before me the undersigned, a

Notary Public in and for the County and State aforesaid, came
John Albers and Rosa Albers his wife

who are personally known to me to be the same persons who executed the within instrument of writing, and such persons each duly acknowledged
the execution of the same.

In Testimony Whereof, I have hereunto set my hand, and affixed my Official
seal, the day and year last above written.

Joseph F. Thompson



State of Kansas, Douglas County, ss: Notary Public, Term Expires Dec 10 1887

I hereby certify the foregoing to be a full, true and perfect copy of the original instrument which was filed with me for
record on the 26th day of June A. D. 1886 at 11 o'clock A.M.
Joseph F. Thompson

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS That WILLIAM M. GIBBONS, Trustee of the Property of the CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, Debtor, as Trustee and not as an individual Grantor herein, pursuant to Court Order No. 234, dated May 5, 1980, entered by the United States District Court for the Northern District of Illinois, Eastern Division, in the Matter of the Chicago, Rock Island and Pacific Railroad Company, Debtor, No. 75 B 2697, and pursuant to every other power and authority to him pertaining, in consideration of the sum of TEN DOLLARS (\$10.00) and other good and valuable consideration, the receipt whereof is hereby acknowledged, does hereby QUITCLAIM and CONVEY, subject to the reservations and exceptions hereinafter set forth, unto CONSUMER OIL COMPANY, INC., herein designated as "Grantee," all of Grantor's right, title and interest, estate, claim and demand, if any, in the following described parcel of land situated in the County of Doniphan, State of Kansas, to wit:

Being a rectangular tract of land lying and located in the West Half of the Southeast Quarter of Section 33, Township 3 South, Range 20 East, Doniphan County, Kansas, more particularly described as follows:

Commencing at the southwest corner of the Southeast Quarter of Section 33; thence North 0° East for a distance of 1,015 feet, more or less, to a point on Grantor's southerly right-of-way line produced as is presently evidenced, monumented, or recorded in Bendena; thence North 81° 30' East, more or less, along Grantor's southerly right-of-way line for a distance of 470 feet, more or less, to the Point of Beginning; thence North 81° 30' East, more or less, along said right-of-way line for a distance of 120 feet, more or less, to a point; thence North 00° East for a distance of 175 feet, more or less, to a point; thence South 81° 30' West, more or less, parallel with Grantor's north right-of-way line for a distance of 120 feet, more or less, to a point; thence South 00° East for a distance of 175 feet, more or less, to the Point of Beginning; containing .482 acre, more or less.

The Grantor reserves unto himself, his successors and assigns, all of the coal, oil, gas, casinghead gas, lignite, sulphur, water and all other ores and minerals of every kind and nature in addition to the foregoing, underlying the surface of the property herein described, together with the full right, privilege and license at any and all times to explore or drill for and to protect, conserve, mine, take, extract, remove and market any and all such products.

The Grantor reserves for himself, his successors and assigns, an easement for the continued maintenance, operation and use of all existing driveways, roads, conduits, sewers, water mains, gas lines, electric power lines, communication lines, wires and other utilities and easements of any kind whatsoever on said premises, whether or not of record, whether owned, operated, used or maintained by Grantor, the Grantor's licensees or others, with the reasonable right of entry for the purpose of repairing, reconstructing and replacing same; and the Grantor further reserves unto himself, his successors and assigns, the right and privilege to convert existing licenses, leases and agreements, for driveways, roads, conduits, sewers, water mains, gas lines, electric power lines, wire and other utilities to permanent easements by issuance of a suitable grant in recordable form.

The grantor reserves for himself, his successors and assigns, a perpetual easement on, over and across that portion of the property represented by hatched lines and designated "Right-of-Way Easement" on Exhibit "A" dated June 12, 1981 and attached hereto and by reference made a part hereof, including, but not limited to, the right to maintain, repair, renew, use and operate any tract or tracks and appurtenances now existing upon or across the property herein described and to construct, maintain, repair, renew, use and operate any additional tract or tracks and appurtenances across the property herein described, and also the right to install, maintain, use and operate wires or cables, together with poles or other structures supporting the same above the surface of said property, or pipes or conduits or other structures beneath the surface of said property.

The Grantee, its successors and assigns, covenant and agree that it shall neither do nor cause to be done any act that will unreasonably impede the flow of drainage water over the property herein described so as to adversely affect rail operations. This covenant shall in no way be construed to prohibit the Grantee from erecting buildings or other improvements on the property herein described, provided that the drainage equivalent to that existing at the time of this conveyance is maintained, whether naturally or by other means. This covenant shall run with the land and be binding upon the Grantee, its successors and assigns.

The Grantor further reserves unto himself, his successors, grantees and assigns exclusive perpetual easements for the installation, maintenance and use of pipelines, telephone, radio, radar or laser transmission systems, wires, fibers, conduits, utility and energy transmission lines of every kind and character with all necessary supporting structures and devices which may be constructed or installed on, under, over, across and along any portion of the property herein described lying within fifty feet of the centerline of the main railroad tracks now existing and represented on Exhibit "A" dated June 12, 1981. Such installation, maintenance and use shall not interfere with the Grantee's use of the surface. The failure of Grantor, his successors, grantees or assignees to exercise easement rights hereby reserved prior to January 1, 1991 shall in no event be construed to be a nonuser causing said easements to terminate, but if Grantor shall fail to convey or assign to others the easement rights hereby reserved by January 1, 1991, then the easements reserved in this paragraph shall automatically cease and determine.

Notwithstanding any other provision of this instrument, the Grantor shall in no event incur liability to the Grantee for failure of or defect in the title or estate of the Grantor in and to the property herein described.

This conveyance is made pursuant to the terms of a Purchase Agreement dated September 1, 1981 and the terms thereof shall survive delivery of this Quitclaim Deed.

124 Wood Co., Inc., Recorder No. 222088-1-11

State of Kansas
Doniphan County SS;

BE IT REMEMBERED that on this 15th day of February, 1984 before me a Notary Public of the county and state aforesaid, came Charles F. Gentet and Betty J. Gentet, husband and wife, who are personally known to me to be the same persons who signed the within and foregoing General Warranty Deed and who then duly acknowledged their execution thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year last above stated.

(SEAL)

Thelma Horner
Notary Public

THELMA HORNER
Doniphan County, Ks
Commission expires: 1-22-87

Filed for record the 15 day of February A.D. 1984 at 3:20 P.M.

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QUIT CLAIM DEED

THIS INSTRUMENT, Made this 17th day of February, A.D. 1984, between RICHARD L. LANTER and DONNA LOUISE LANTER, HUSBAND AND WIFE, of Atchison County, in the State of Kansas, of the first part and DONNA LOUISE LANTER, TRUSTEE OF THE DONNA LOUISE LANTER REVOCABLE LIVING TRUST, of Atchison County, in the State of Kansas of the second part:

WITNESSETH, That said parties of the first part, in consideration of the sum of One and No/100 DOLLARS, the receipt of which is hereby acknowledged do by these presents, REMISE, RELEASE AND QUIT-CLAIM, unto said party of the second part, her successors and assigns, all the following-described real estate situated in the County of Doniphan and State of Kansas, to-wit:

The Southeast Quarter (SE $\frac{1}{4}$) of Section Thirty-three (33), Township Four (4), Range Nineteen (19), Doniphan County, Kansas, and

The Southwest Quarter (SW $\frac{1}{4}$) of Section Thirty-four (34), Township Four (4), Range Nineteen (19), containing 320 acres more or less, Doniphan County, Kansas

The South Half of the Northwest Quarter of Section 33, Township 4, Range 19, Doniphan County, Kansas

SUBJECT TO THE TERMS OF A REVOCABLE LIVING TRUST AGREEMENT DATED February 17, 1984.

TO HAVE AND TO HOLD THE SAME, Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, forever.

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hands, the day and year first above written.

Richard L. Lanter
RICHARD L. LANTER

Donna Louise Lanter
DONNA LOUISE LANTER

STATE OF KANSAS, ATCHISON COUNTY, SS.

BE IT REMEMBERED, That on this 17th day of February A.D. 1984, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came RICHARD L. LANTER and DONNA LOUISE LANTER, HUSBAND AND WIFE, who are personally known to me to be the same persons who executed the within instrument of writing, and such persons duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.

(SEAL)

Evelyn Lorenz
EVELYN LORENZ Notary Public

My Appointment Expires: 1-28-85

Filed for record the 21 day of February A.D. 1984 at 9:00 A.M.

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CORPORATION QUIT-CLAIM DEED

THIS INSTRUMENT, made on the 13th day of February, A.D., One Thousand Nine Hundred and Eighty-four, by and between SCF, Inc., a corporation, duly organized under the laws of the State of Missouri, of the County of Jackson, State of Missouri, Party of the First Part, and Edwin Dennis Ford and Carolyn K. Ford, husband and wife, of the County of Doniphan, State of Kansas, Parties of the Second Part, (Mailing address of said first named grantee is Wathena, Kansas 66090).

WITNESSETH, that the said Party of the First Part, in consideration of sum of One Dollar (\$1.00), to it in hand paid by the Parties of the Second Part, the receipt of which

DEED RECORD NO. 175

Lockwood Co., Inc., Recorder No. 222698-143

is hereby acknowledged, does, by these presents REMISE, RELEASE and FOREVER QUIT-CLAIM unto the said Parties of the Second Part, the following described lots, tracts or parcels of land, lying, being and situate in the County of Doniphan and State of Kansas, to-wit:

Commencing at the Southwest Corner of the Southeast One-Quarter (SE $\frac{1}{4}$) of Section 33, Township 3 South, Range 20 East of the Sixth Principal Meridian, Doniphan County, Kansas; thence North 0 degrees 00 minutes 00 seconds East (assumed bearing), along the West line of said Southeast Quarter, 650.63 feet; thence North 81 degrees 00 minutes 40 seconds East parallel to the center line of the Chicago, Rock Island and Pacific Railroad, 590.37 feet; thence North 0 degrees 00 minutes 00 seconds, East, parallel to the West line of said Southeast Quarter, 143.91 feet to a point 10 feet South of the centerline of the industrial spur track to the True Point of Beginning; thence Easterly along a line 10 feet South of and parallel with said spur track, 301 feet, more or less; thence North 0 degrees 00 minutes 00 seconds, East, parallel to the West line of said Southeast Quarter, 23 feet, more or less, to a point 25 feet South of the centerline of the main track of the Chicago Rock Island and Pacific Railroad Company; thence Westerly along a line 25 feet South of and parallel with said main track centerline 300 feet, more or less, thence South 0 degrees 00 minutes 00 seconds West, parallel to the West line of said Southeast Quarter, to the True Point of Beginning.

TO HAVE AND TO HOLD THE SAME, with all the rights, immunities, privileges, and appurtenances, thereto belonging, unto the said Parties of the Second Part and unto their heirs and assigns forever; so that neither the said Party of the First Part, nor any other person or persons, for it or in its name or behalf, shall or will hereafter claim or demand any right or title to the aforesaid premises or any part thereof, but they and each of them shall, by these presents, be excluded and forever barred.

IN WITNESS WHEREOF, The said Party of the First Part has caused these presents to be signed by its Vice-President and attested by its Secretary, and the corporate seal to be hereto attached, the day and year first above written.

ATTEST: (CORP SEAL)

SCF, INC.

Linda S. Moser
Secretary

By F. Craig Lack
Vice-President

STATE OF MISSOURI)
) SS.
COUNTY OF BUCHANAN)

On this 13th day of February, 1984, before me, appeared F. Craig Lack, to me personally known, who being duly sworn, did say that he is the Vice-President of SCF, Inc., a corporation, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and the said F. Craig Lack acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal at my office in St. Joseph, Missouri, the day and year last above written.

(SEAL)

Stephen J. Briggs (Stephen J. Briggs)
Notary Public with and for said County and State

My Commission Expires: February 19, 1985

Filed for record the 21 day of February A.D. 1984 at 10:30 A.M.

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WARRANTY DEED

~~Clarence Nold and Amanda Doris Nold, husband and wife, CONVEY AND WARRANT TO: Laipple Farms, Inc., a Kansas Corporation~~

~~The North Half of the South Half of the Southwest Quarter of Section Nine (9), Township Three (3), Range Twenty-Two (22), and the South Half of the North Half of the Southwest Quarter of Section Nine (9), Township Three (3), Range Twenty-Two (22), Doniphan County, Kansas,~~

~~for the consideration of ONE DOLLAR and other valuable considerations.~~

~~Dated: March 29, 1983~~

~~Clarence Nold
Clarence Nold~~

~~Amanda Doris Nold
Amanda Doris Nold~~

**Court Documents Related to
Railroad Right-of-Way Abandonment of Easement**

FILED

3-24-1993

Norma Jean Russell
CLERK OF THE DISTRICT COURT
10:00 A.M.

IN THE DISTRICT COURT OF DONIPHAN COUNTY, KANSAS.

THE BOARD OF COUNTY COMMISSIONERS OF
DONIPHAN COUNTY, KANSAS,

PLAINTIFF,

VS.

NO. 91 C 26

LONNIE L. BEAR, ET AL.,

DEFENDANTS,

VS.

JAMES L. RUDDY, ET AL.,

INTERVENOR-DEFENDANTS.

ORDER NUNC PRO TUNC

Now on this the 23rd day of
March, 1993, the above entitled matter comes on for
hearing before the Court on the motion of William R. McQuillan.
The movant appears in person. There are no other appearances.

Thereupon, the motion is presented to
the Court and the Court, after consideration thereof, FINDS that no
notice of hearing upon the motion is required and that the same
should be heard without notice instanter on this date and IT IS BY
THE COURT SO ORDERED.

Thereupon, evidence is introduced
upon the motion, and the Court, after consideration thereof, FINDS:

1. All allegations contained in the
Motion are true.

2. On October 13, 1992, a Journal
Entry of same date was entered in the above proceeding wherein the
Court ordered and decreed that the individual Intervenor-Defendants

were the owners of the fee simple title in and to certain tracts of real estate. Specifically paragraphs 6 and 21 of said Journal Entry provided as follows, to wit:

"6. (a) As to that property referred to in the Petition as Exhibit 16 and described as all of the abandoned railroad right-of-way in the West 60 acres of the Southwest Quarter and middle 50 feet of right-of-way in the East 100 acres of the Southwest Quarter less highway right-of-way all in Section 33, Township 3, Range 20 East and referred to by the Doniphan County Appraiser's Office as parcel no. IN015A 118 33 0 30 10 005.00, except as to that part thereof in the West 60 acres described in paragraph 5 above, the South half of this former servient estate is located on real estate owned by intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, by virtue of a deed recorded in Book 166 Page 81. By reason of abandonment of the easement premises the full fee simple title thereto should be quieted in intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, and against defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number set forth therein should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 010.00.

"(c) The former servient estate lying on the North one-half of easement premises described in subparagraph (a) above is presently titled in fee simple in intervenor-defendant, Caudle Development Co., Inc., by virtue of a deed recorded in Book 171 Page 338. By reason of abandonment of the railroad right-of-way the full fee simple title thereto should be quieted in intervenor-defendant, Caudle Development Co., Inc. and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 003.00."

"21. (a) The property referred to in the Petition as Exhibit No. 43 and described as abandoned railroad right-of-way in the East Half of the Northeast Quarter and the Southeast Quarter except the North 75 feet less highway right-of-way and referred to by the Doniphan County Appraiser's Office as parcel no. 132 03 0 10 01 005 and 132 03 0 40 07 001.00 and Denton 14C, 14C-1, 14C-2 is located on the former servient estate of the City of Denton, Kansas and Atchison County Farmers Union Cooperative Association by virtue of deeds recorded in Book 166, Page 597 and 600 and the former servient estate of Roberts Bros. Inc., a Kansas Corporation by virtue of deed recorded in Book 159, Page 567. The North 74 feet exception above referred to consists of land deeded by the railroad's bankruptcy trustee to the said Roberts Bros. Inc. by Quit Claim Deed recorded in Book 171, Page 282. By reason of abandonment of the railroad right-of-way the dominant estate has been finally terminated and extinguished and, the full fee simple title to that portion of such tract lying South of the centerline of the former mainline railroad tracks should be quieted in intervenor-defendants, City of Denton and Atchison County Farmers Union Cooperative Association, and against the defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number described therein should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel lying South of the centerline of the former mainline railroad tracks should be included in the parcel numbers of the former servient estate, numbers 132 03 0 40 03 001.00, 132 03 0 40 07 002.00 and 132 03 0 40 17 002.00.

"(c) The former servient estate lying North of the centerline of the former mainline railroad tracks of said easement premises described in subparagraph (a) above is presently titled in fee simple in intervenor-defendant, Robert Bros. Inc., a Kansas Corporation, by virtue of deeds recorded in Book 171, Page 282 and Book 159, Page 567. By reason of abandonment of the railroad right-of-way the full fee simple title thereto should be quieted in intervenor-defendant, Robert Bros. Inc., a Kansas Corporation, and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel lying North of the centerline of the former mainline railroad tracks should be included in the parcel number of the former servient estate, number 132-030-10-01-1."

3. Due to clerical mistake the real estate descriptions and related references set forth in said paragraphs 6 and 21 of the October 13, 1992, Journal Entry were erroneously set forth and pursuant to K.S.A. 60-260(a) an Order Nunc Pro Tunc should enter herein correcting the said real estate descriptions and related references and that paragraphs 6 and 21 of the aforesaid Journal Entry dated October 13, 1992, should read as follows, to wit:

"6. (a) As to that property referred to in the Petition as Exhibit 16 and described as all of the abandoned railroad right-of-way in the West 60 acres of the Southwest Quarter and middle 50 feet of right-of-way in the East 100 acres of the Southwest Quarter less

highway right-of-way all in Section 33, Township 3, Range 20 East and referred to by the Doniphan County Appraiser's Office as parcel no. IN015A 118 33 0 30 10 005.00, except as to that part thereof in the West 60 acres described in paragraph 5 above, the South half of this former servient estate is adjoining and located on real estate owned by intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, by virtue of a deed recorded in Book 166 Page 81. By reason of abandonment of the easement premises the full fee simple title thereto should be quieted in intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, and against defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number set forth therein should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 010.00.

"(c) The former servient estate lying on the North one-half of easement premises described in subparagraph (a) above is adjoining and located on land presently titled in fee simple in intervenor-defendant, Caudle Development Co., Inc., by virtue of a deed recorded in Book 171 Page 338. By reason of abandonment of the railroad right-of-way the full fee simple title thereto should be quieted in intervenor-defendant, Caudle Development Co., Inc. and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 003.00.

"(e) As to all of that property referred to in the Petition as Exhibit 16 and described as all of the abandoned railroad right-of-way in the West 60 acres of

the Southwest Quarter and middle 50 feet of right-of-way in the East 100 acres of the Southwest Quarter less highway right-of-way all in Section 33, Township 3, Range 20 East and referred to by the Doniphan County Appraiser's Office as parcel No. IN015A 118 330 30 10 005.00, except as to that part referred to in paragraphs (a) - (d) above, such land is adjoining and located on the former servient estate of Paul C. Johnson and Mary Linn Johnson by virtue of a deed recorded in Book 166, Page 381. By reason of the abandonment of the railroad right-of-way, the dominant estate has been finally terminated and extinguished and the full fee simple title to such real estate should be quieted in intervenor-defendants, Paul C. Johnson and Mary Linn Johnson, and against defendant, Dirt and Gravel, Inc."

"21. (a) The property referred to in the Petition as Exhibit No. 43 and described as abandoned railroad right-of-way in the East Half of the Northeast Quarter and the Southeast Quarter except the North 75 feet less highway right-of-way and referred to by the Doniphan County Appraiser's Office as parcel no. 132 03 0 10 01 005 and 132 03 0 40 07 001.00 and Denton 14C, 14C-1, 14C-2 is located on the former servient estate of the City of Denton, Kansas and Atchison County Farmers Union Cooperative Association by virtue of deeds recorded in Book 166, Page 597 and 600 and the former servient estate of Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation by virtue of deed recorded in Book 159, Page 567. The North 75 feet exception above referred to consists of land deeded by the railroad's bankruptcy trustee to the said Roberts Bros. Inc. by Quit Claim Deed recorded in Book 171, Page 282. By reason of abandonment of the railroad right-of-way the dominant estate has been finally terminated and extinguished and, the full fee simple title to that part of the land described and referred to in the aforesaid Exhibit No. 43 which is described as follows:

Beginning at the Northwest Corner of the first tract of land described and conveyed to the

Atchison County Farmers Union Cooperative Association by William H. Gibbons as Trustee for the Chicago, Rock Island and Pacific Railroad Company in that certain Quit Claim Deed recorded in the office of the Doniphan County Register of Deeds in Book 166 at Page 597, thence North on the East line of F Street, 138 feet, more or less, to a point on the South right-of-way line of North Street, thence in a Northeasterly direction along the South right-of-way line of North Street, 640 feet, more or less, to the West right-of-way line of D Street, thence South and East along the West right-of-way line of D Street, 150 feet, more or less, to the Northeast corner of the aforementioned first tract described in the deed recorded in Book 166, Page 597, thence Southwesterly along the North line of the aforementioned first tract 718 feet, more or less, to the point of beginning.

AND,

Commencing at a point which is the Northwest Corner of the second tract of land described and conveyed by the Atchison County Farmers Union Cooperative Association, a cooperative corporation to the City of Denton, Kansas in a deed duly recorded in the office of the Doniphan County Register of Deeds in Book 166 at Page 600, thence North along the East right-of-way line of D Street to the centerline of the old main track of the Chicago, Rock Island and Pacific Railroad Company (CRI&P), thence Northeasterly 695 feet, more or less, along the centerline of the main track and parallel to the North line of the aforementioned second tract described in the deed recorded in Book 166, Page 600, a distance of 695 feet, more or less, thence Southeasterly to a point which is the Northeast Corner of the aforementioned second

tract described in the deed recorded in Book 166, Page 600, thence Southwesterly along the North line of the aforementioned second tract described in the Deed recorded in Book 166, Page 600 to the point of beginning;

should be quieted in intervenor-defendants, City of Denton and Atchison County Farmers Union Cooperative Association, and against the defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number described therein should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel specifically described in subparagraph (a) last above should be included in the parcel numbers of the former servient estate, numbers 132 03 0 40 03 001.00, 132 03 0 40 07 002.00 and 132 03 0 40 17 002.00.

"(c) As to that part of the former servient estate lying North of the centerline of the former mainline railroad track of said easement premises described in subparagraph (a) above which adjoins land presently titled in fee simple in intervenor-defendant, Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation, by virtue of deeds recorded in Book 171, Page 282 and Book 159, Page 567, to wit:

Commencing at the Southeast corner of a tract of land conveyed by William Gibbons as Trustee of the Chicago, Rock Island and Pacific Railroad Company (CRI&P) to Roberts Brothers Inc. in a deed duly recorded in the office of the Doniphan County Register of Deeds in Book 171 at Page 282, thence South to the center line of the old main track of the CRI&P, then Southwesterly along the center line of the main track 1,395 feet more or less, to a point, thence North to the Southwest corner of the aforementioned tract described in the deed

recorded in Book 171, Page 282, thence Northeasterly 1,395 feet more or less to the point of beginning,

by reason of the abandonment of the railroad right-of-way, the full fee simple title thereto should be quieted in intervenor-defendant, Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation, and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel specifically described in subparagraph (c) above should be included in the parcel number of the former servient estate, number 132-030-10-01-1."

IT IS THEREFORE BY THE COURT
CONSIDERED, ORDERED AND ADJUDGED:

A. The findings hereinbefore made constitute and are a part of the judgment and decree herein entered.

B. That paragraphs 6 and 21 of the October 13, 1992, Journal Entry and the real estate set forth therein should read as follows, to wit:

"6. (a) As to that property referred to in the Petition as Exhibit 16 and described as all of the abandoned railroad right-of-way in the West 60 acres of the Southwest Quarter and middle 50 feet of right-of-way in the East 100 acres of the Southwest Quarter less highway right-of-way all in Section 33, Township 3, Range 20 East and referred to by the Doniphan County

Appraiser's Office as parcel no. IN015A 118 33 0 30 10 005.00, except as to that part thereof in the West 60 acres described in paragraph 5 above, the South half of this former servient estate is adjoining and located on real estate owned by intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, by virtue of a deed recorded in Book 166 Page 81. By reason of abandonment of the easement premises the full fee simple title thereto should be quieted in intervenor-defendants, George H. Johnson, Jr. and Erma L. Johnson, and against defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number set forth therein should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 010.00.

"(c) The former servient estate lying on the North one-half of easement premises described in subparagraph (a) above is adjoining and located on land presently titled in fee simple in intervenor-defendant, Caudle Development Co., Inc., by virtue of a deed recorded in Book 171 Page 338. By reason of abandonment of the railroad right-of-way the full fee simple title thereto should be quieted in intervenor-defendant, Caudle Development Co., Inc. and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and such parcel should be included in the parcel number of the former servient estate, number 118 33 0 30 01 003.00.

"(e) As to all of that property referred to in the Petition as Exhibit 16 and described as all of the abandoned railroad right-of-way in the West 60 acres of

the Southwest Quarter and middle 50 feet of right-of-way in the East 100 acres of the Southwest Quarter less highway right-of-way all in Section 33, Township 3, Range 20 East and referred to by the Doniphan County Appraiser's Office as parcel No. IN015A 118 330 30 10 005.00, except as to that part referred to in paragraphs (a) - (d) above, such land is adjoining and located on the former servient estate of Paul C. Johnson and Mary Linn Johnson by virtue of a deed recorded in Book 166, Page 381. By reason of the abandonment of the railroad right-of-way, the dominant estate has been finally terminated and extinguished and the full fee simple title to such real estate should be quieted in intervenor-defendants, Paul C. Johnson and Mary Linn Johnson, and against defendant, Dirt and Gravel, Inc."

"21. (a) The property referred to in the Petition as Exhibit No. 43 and described as abandoned railroad right-of-way in the East Half of the Northeast Quarter and the Southeast Quarter except the North 75 feet less highway right-of-way and referred to by the Doniphan County Appraiser's Office as parcel no. 132 03 0 10 01 005 and 132 03 0 40 07 001.00 and Denton 14C, 14C-1, 14C-2 is located on the former servient estate of the City of Denton, Kansas and Atchison County Farmers Union Cooperative Association by virtue of deeds recorded in Book 166, Page 597 and 600 and the former servient estate of Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation by virtue of deed recorded in Book 159, Page 567. The North 75 feet exception above referred to consists of land deeded by the railroad's bankruptcy trustee to the said Roberts Bros. Inc. by Quit Claim Deed recorded in Book 171, Page 282. By reason of abandonment of the railroad right-of-way the dominant estate has been finally terminated and extinguished and, the full fee simple title to that part of the land described and referred to in the aforesaid Exhibit No. 43 which is described as follows:

Beginning at the Northwest Corner of the first tract of land described and conveyed to the Atchison County Farmers Union Cooperative Association by William H. Gibbons as Trustee for the Chicago, Rock Island and Pacific Railroad Company in that certain Quit Claim Deed recorded in the office of the Doniphan County Register of Deeds in Book 166 at Page 597, thence North on the East line of F Street, 138 feet, more or less, to a point on the South right-of-way line of North Street, thence in a Northeasterly direction along the South right-of-way line of North Street, 640 feet, more or less, to the West right-of-way line of D Street, thence South and East along the West right-of-way line of D Street, 150 feet, more or less, to the Northeast corner of the aforementioned first tract described in the deed recorded in Book 166, Page 597, thence Southwesterly along the North line of the aforementioned first tract 718 feet, more or less, to the point of beginning.

AND,

Commencing at a point which is the Northwest Corner of the second tract of land described and conveyed by the Atchison County Farmers Union Cooperative Association, a cooperative corporation to the City of Denton, Kansas in a deed duly recorded in the office of the Doniphan County Register of Deeds in Book 166 at Page 600, thence North along the East right-of-way line of D Street to the centerline of the old main track of the Chicago, Rock Island and Pacific Railroad Company (CRI&P), thence Northeasterly 695 feet, more or less, along the centerline of the main track and parallel to the North line of the aforementioned second tract described in the deed recorded in Book 166, Page 600, a distance of 695 feet, more or less, thence Southeasterly to a point which is the Northeast

Corner of the aforementioned second tract described in the deed recorded in Book 166, Page 600, thence Southwesterly along the North line of the aforementioned second tract described in the Deed recorded in Book 166, Page 600 to the point of beginning;

should be quieted in intervenor-defendants, City of Denton and Atchison County Farmers Union Cooperative Association, and against the defendant, Dirt and Gravel, Inc.

"(b) By virtue of the provisions of subparagraph (a) above, the parcel number described therein should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel specifically described in subparagraph (a) last above should be included in the parcel numbers of the former servient estate, numbers 132 03 0 40 03 001.00, 132 03 0 40 07 002.00 and 132 03 0 40 17 002.00.

"(c) As to that part of the former servient estate lying North of the centerline of the former mainline railroad track of said easement premises described in subparagraph (a) above which adjoins land presently titled in fee simple in intervenor-defendant, Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation, by virtue of deeds recorded in Book 171, Page 282 and Book 159, Page 567, to wit:

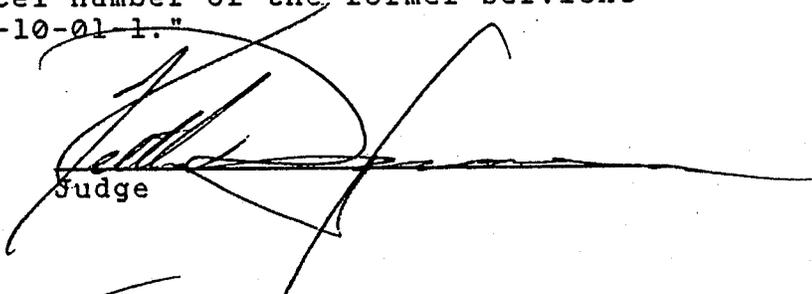
Commencing at the Southeast corner of a tract of land conveyed by William Gibbons as Trustee of the Chicago, Rock Island and Pacific Railroad Company (CRI&P) to Roberts Brothers Inc. in a deed duly recorded in the office of the Doniphan County Register of Deeds in Book 171 at Page 282, thence South to the center line of the old main track of the CRI&P, then Southwesterly along the center line of the main track 1,395 feet more or less, to a point, thence North to the Southwest corner of the aforementioned tract described in the deed

Page 14 - Order Nunc Pro Tunc, Board of County Commissioners of Doniphan County, Kansas vs. Lonnie L. Bear, Et al, vs. James L. Ruddy, Et al, Case No. 91 C 26

recorded in Book 171, Page 282, thence Northeasterly 1,395 feet more or less to the point of beginning,

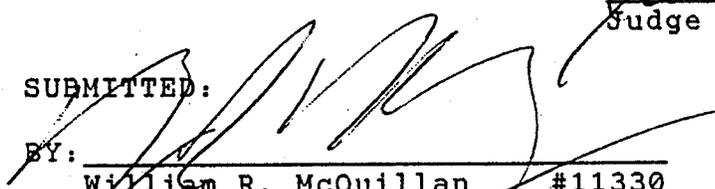
by reason of the abandonment of the railroad right-of-way, the full fee simple title thereto should be quieted in intervenor-defendant, Roberts Farms, Inc., formerly Roberts Bros. Inc., a Kansas Corporation, and against the defendant, Dirt and Gravel, Inc.

"(d) By virtue of the provisions of subparagraph (c) above, the above described parcel number should be stricken from the records in the Doniphan County Appraiser's Office and that portion of such parcel specifically described in subparagraph (c) above should be included in the parcel number of the former servient estate, number 132-030-10-011."


Judge

SUBMITTED:

BY:


William R. McQuillan #11330
Euler and McQuillan
137 South Main, P.O. Box 326
Troy, Kansas 66087
Telephone: 913/985-3561

**Articles of Incorporation and Dissolution for
Bendena Grain Company, Inc.**

'80 JUL 16 AM 7:55

7/16/80

D-646083

FILED
JACK H. BRIER
SECRETARY OF STATE
KANSAS

ARTICLES OF INCORPORATION

OF

JUL 10 3

05400 ***50.00

BENDENA GRAIN COMPANY

Pursuant to the provisions of the Kansas General Corporation Code, the undersigned do hereby organize and incorporate a Kansas Corporation as follows:

FIRST: The name of the corporation is: BENDENA GRAIN COMPANY.

SECOND: The address of the corporation's registered office in Kansas is: Highway 36 East, Wathena, Doniphan County, Kansas 66090.

THIRD: The name of the corporation's Resident Agent at the above address is: Edwin Dennis Ford.

FOURTH: This corporation is organized FOR PROFIT and the nature of the business to be conducted, and the purposes of the corporation, is to engage in any lawful act or activity for which corporations may be organized under the Kansas General Corporation Code as such statement of purposes is contemplated and intended in K.S.A. Supp. 17-6002(3) specifically including, but in no way limited to, the agricultural and horticultural business, including but not limited to, the producing, planting, raising, harvesting or gathering of wheat, corn, grain sorghums, barley, oats, rye and potatoes and the milking of cows for dairy purposes, all as intended and contemplated in K.S.A. 17-5901.

FIFTH: The corporation is authorized to issue only one class of stock, namely, Common Stock. The total number of shares of Common Stock which the corporation shall have authority to issue is Five Hundred Thousand (500,000) shares and the par value of each of such shares shall be One Dollar (\$1.00).

SIXTH: The name and mailing addresses of the incorporators are:

41

1. Edwin Dennis Ford
Highway 36 East
Wathena, Kansas 66090
2. Carolyn K. Ford
Highway 36 East
Wathena, Kansas 66090.

SEVENTH: The incorporators shall adopt the original by-laws of the corporation and shall elect the initial Board of Directors and perform such other acts as are authorized and provided in K.S.A. 17-6007 and 6008; thereafter, the Board of Directors shall be authorized to make, alter or repeal the by-laws of the corporation all as authorized in K.S.A. Supp. 17-6009 subject, however, to the right of the stockholders to likewise make, alter or repeal such by-laws.

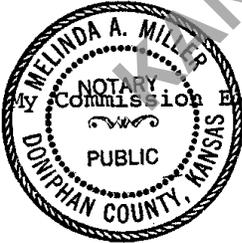
IN WITNESS WHEREOF, the undersigned incorporators have hereunto set their hand on this the 8th day of July, 1980.

Edwin Dennis Ford
Edwin Dennis Ford
Carolyn K. Ford
Carolyn K. Ford

STATE OF KANSAS, COUNTY OF DONIPHAN, SS:

The foregoing instrument was acknowledged before me on this the 8th day of July, 1980, by Edwin Dennis Ford and Carolyn K. Ford.

Melinda A. Miller
Notary Public - Melinda A. Miller



Commission Expires: December 16, 1982

NON-CERTIFIED WEB COPY
4/30/2013 10:37:15 AM

646083

Contact Information
 Kansas Secretary of State
Ron Thornburgh
 Memorial Hall, 1st Floor
 120 S.W. 10th Avenue
 Topeka, KS 66612-1594
 (785) 296-4564
 kssos@kssos.org
 www.kssos.org

KANSAS SECRETARY OF STATE
For Profit Corporation Dissolution by Written Consent

DW
 53-01

All information must be completed or this document will not be accepted for filing.

Name of the corporation:
Bendena Grain Company
Name must match the name on record with the secretary of state

All the stockholders with voting power do hereby consent to the dissolution of the corporation.

12-30-2004	08:47:00
053	\$35.00
1579	01
0646083	DD



01026176

Stockholders' signatures

Carolyn K. Ford
Edwin Dennis Ford

Officers: Name	Title	Address	City	State	Zip
Edwin Dennis Ford	president		Wathena	Kansas	66090
Carolyn K. Ford	sec/treas.		Wathena	Kansas	66090

Directors: Name	Address	City	State	Zip
Same as above				

I, Edwin Dennis Ford, declare under penalty of perjury under the laws of the state of Kansas, that I am an officer of the above-named corporation, that the above consent has been signed by or on behalf of ALL stockholders entitled to vote on the dissolution, and that the foregoing is true and correct.

Executed on the 30 of Dec, 2004
 Day Month Year

Edwin Dennis Ford
 Signature of Secretary or other Officer

FILED
 SECRETARY OF STATE
 2004 DEC 29 PM 7:33

Instructions

1. Submit this form in duplicate with the \$35 filing fee.
2. If this form is submitted after the close of the corporation's tax year, an annual report and franchise tax must be submitted for that year.

Notice: There is a \$25 service fee for all returned checks.



Environmental Science Division

Argonne National Laboratory
9700 South Cass Avenue, Bldg. 203
Argonne, IL 60439-4843
www.anl.gov



U.S. DEPARTMENT OF
ENERGY

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