QUALITY OF WATER IN THE RED RIVER ALLUVIAL AQUIFER, POOL 1, RED RIVER WATERWAY AREA, Vick, LOUISIANA

By Charles W. Smoot, Ronald C. Seanor, and G.F. Huff

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To obtain
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
million gallons per day (Mgal/d)	0.04381	cubic meters per second

Temperature in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) as follows: $°F = 1.8(°C) + 32$.

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviated water-quality units:

micrograms per liter (µg/L)

microsiemens per centimeter at 25 degrees Celsius (µS/cm)

milligrams per liter (mg/L)

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Abstract

Water-quality changes in the Red River alluvial aquifer within the area affected by pool 1 near Vick, Louisiana, were monitored during pre-construction (1974-78) and post-construction (1984-92) of Lock and Dam 1. Changes greater or less than background values have occurred in an area within 2 miles of Lock and Dam 1, and in one well located about 10 miles west of Lock and Dam 1.

Comparison between the pre-construction and post-construction water-quality analyses indicated the total hardness as calcium carbonate and concentrations of dissolved chloride, iron, and manganese generally have decreased in the Red River alluvial aquifer south of the Red River and near Lock and Dam 1. The maximum decrease of the median total hardness as calcium carbonate was from 730 to 330 mg/L (milligrams per liter), dissolved chloride from 77 to 46 mg/L, dissolved iron from 18 to 6.9 mg/L, and dissolved manganese from 1.4 to 0.56 mg/L. Analyses of water from wells west of Lock and Dam 1 indicated an increase of the median total hardness as calcium carbonate was from 200 to 260 mg/L, and dissolved iron concentration was from 0.33 to 1.4 mg/L. North of the river and 1 mile west of Lock and Dam 1, the median concentration of dissolved chloride increased from 45 to 130 mg/L in water from one well, and median total hardness as calcium cabonate and concentrations of dissolved iron and manganese also increased. Because well Ct-74 is completed in a sand that is in contact with a saltwater sand of Tertiary age, this increase is probably a temporal increase due to upconing after lowering the water level in the alluvial aquifer by pumping of dewatering wells during construction of Lock and Dam 1.

INTRODUCTION

The Red River alluvial aquifer is the only source of fresh ground water within the Red River Valley in the area affected by the impoundment of water by Lock and Dam 1 (pool 1). The structure was completed on the Red River waterway near Vick, Louisiana, in March 1984. The aquifer provides water for irrigation and domestic use, but the water for public supply or industrial use requires treatment (reduction or removal of hardness and iron) before use. In addition, water from the aquifer has a relatively low and constant temperature, which makes it suitable for other uses such as industrial cooling.

The Red River alluvial aquifer is an important resource in the valley, and knowledge of the effects of the construction and operation of Lock and Dam 1 on its quality of water is needed. In response to this need, the U.S. Geological Survey, in cooperation with the U.S. Army Corps of

Engineers, began a study in 1974 to determine the quality of water in the aquifer. The study included the systematic collection and analysis of selected water-quality samples from the Red River alluvial aquifer during the following periods: (1) Prior to construction (pre-construction, 1974-78), (2) during construction (1979-83), and (3) after construction (post-construction, 1984-92) of a lock and dam structure on the Red River waterway. In 1978, 64 wells with a combined pumping rate of more than 100 Mgal/d were installed to dewater the Red River alluvial aquifer at the construction site for Lock and Dam 1. About half of these wells were pumped, most of the time, from January 1979 to March 1984 (Adolfo Ramirez, U.S. Army Corps of Engineers, oral commun., 1992).

Purpose and Scope

This report describes the effects of construction and operation of Lock and Dam 1 on the Red River on water quality in the Red River alluvial aquifer in the pool 1 area. Specifically, water-quality changes were evaluated from analyses of hardness and three constituents in water from wells completed in the Red River alluvial aquifer. The three constituents are dissolved chloride, dissolved iron, and dissolved manganese. The changes were determined by statistical analysis of data collected from 1974 to 1978 (pre-construction) and from 1984 to 1992 (post-construction). Graphs also were used to evaluate water-quality changes in the aquifer. The graphs illustrate the changes from 1974 to 1992 in values of total hardness and concentrations of dissolved chloride, iron, and manganese in selected wells.

Results of an extensive suite of water-quality analyses of water samples collected from 88 wells in the pool 1 area from 1974 to 1992 also are tabulated. These water-quality analyses establish a broad water-quality data base for the Red River alluvial aquifer. Periodic sampling of 18 of these wells in the study area was continued through 1990 and sampling of 5 of these wells was continued through 1992 to document the quality of water in the Red River alluvial aquifer during the pre-construction, construction, and post-construction periods of Lock and Dam 1. Water-quality analyses for samples collected from 18 selected wells completed in the Red River alluvial aquifer (located between Lock and Dams 1 and 2) are presented in a table. Analyses for water-quality samples collected prior to 1974 also are included in this table. All data are on file at the U.S. Geological Survey.

Description of Study Area

The pool 1 study area (fig. 1) for this report is within the Red River Valley in the State of Louisiana and extends from Lock and Dam 1, in Catahoula Parish, upstream to Lock and Dam 2, in Rapides Parish. Lock and Dam 1 is located about 10 mi upstream (west) of the confluence of the Black and Red Rivers. Lock and Dam 1 is located about 40 mi downstream from Lock and Dam 2. The pool 1 study area includes parts of Avoyelles, Catahoula, and Rapides Parishes. Normal design operating conditions for Lock and Dam 1 call for an upstream pool altitude of 40 ft and a downstream river altitude of about 4 ft (Smoot and Martin, 1991, sheet 1).

The flood plain in this area ranges from 10 mi to more than 20 mi wide. The altitude of land surface in the valley ranges from an average of 40 ft in Avoyelles Parish to an average of 65 ft above sea level in southeastern Rapides Parish. The annual precipitation ranges from 45 to 65 in. The primary land use is agriculture.

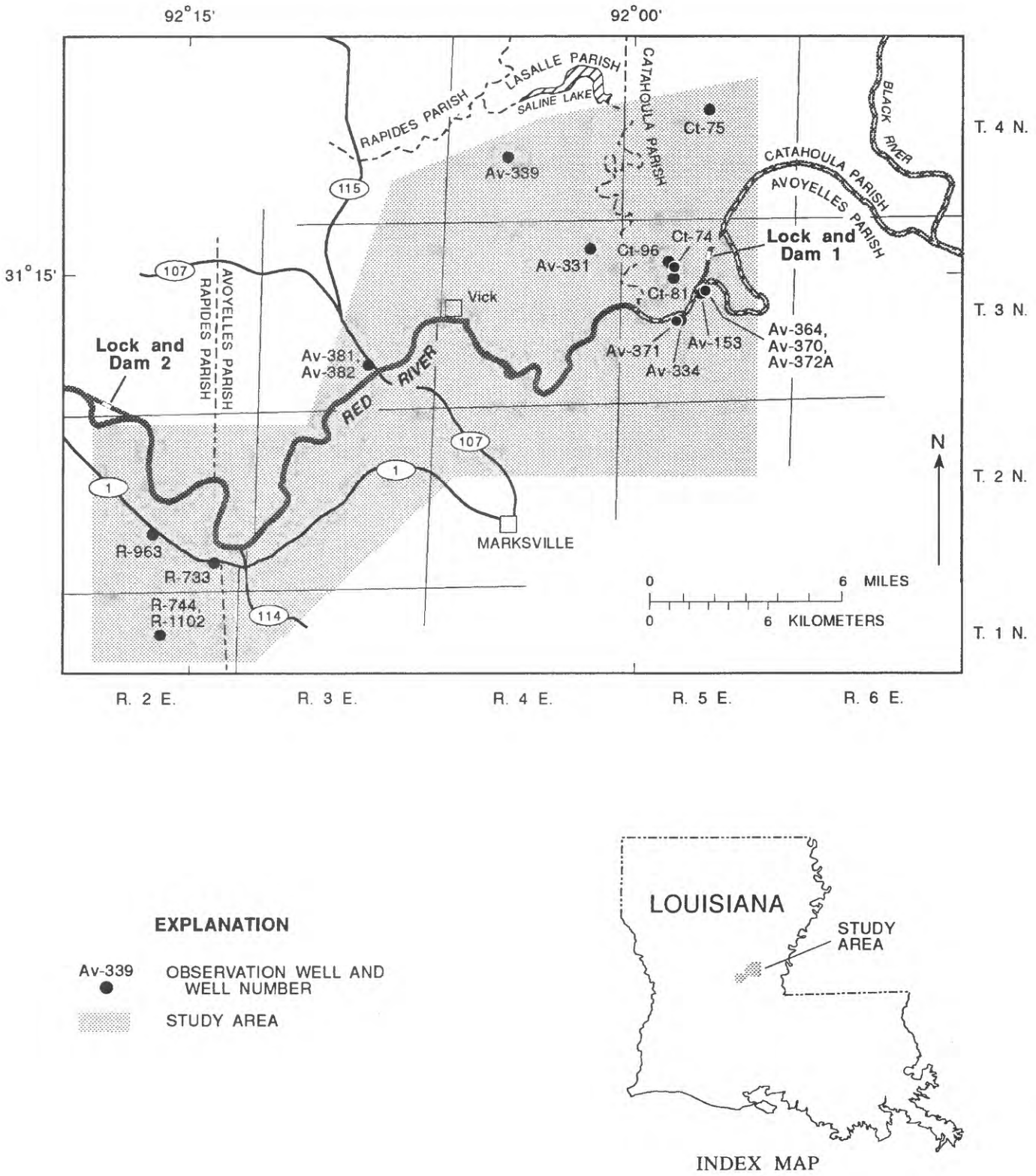


Figure 1. Location of pool 1 study area and selected wells completed in the Red River alluvial aquifer, Louisiana.

Previous Studies

Water-quality analyses from wells in the Red River alluvial aquifer collected through 1978 were compiled in a report by Whitfield (1980). Also in Whitfield's report are maps showing areal distribution of selected water-quality properties and constituents in water from wells in the aquifer. Tabulation of water-quality data collected from 1978 to 1985 was compiled by Smoot and Guillot (1988). Potentiometric surfaces of the Red River alluvial aquifer, pool 1, are illustrated in a map report by Smoot and Martin (1991).

HYDROGEOLOGY

The Red River alluvium lies unconformably on the eroded surface of sediments of Tertiary age and ranges from about 100 to 200 ft in thickness within the study area. The alluvium grades downward from clay and silt at the surface to sand and gravel at the base. The overlying surficial clay and silt of Holocene age ranges in thickness from a few feet to more than 50 ft.

The lower, coarse-grained section of the alluvium is the Red River alluvial aquifer of Pleistocene age. Gravel is common near the base of the aquifer, and the base of the aquifer generally is marked by the deepest occurrence of gravel (Whitfield, 1980, p. 6). The alluvial aquifer ranges in thickness from 40 to 170 ft within the study area. At places, the Red River alluvial aquifer is hydraulically connected to a sand of Tertiary age, as the drillers log of well Ct-74 indicates (Smoot, 1983, p. 79). Chemical analysis and electric log interpretations indicate the water from this sand is salty.

Water in the alluvial aquifer generally is confined by overlying beds of clay and silt. Water enters the aquifer by infiltration of precipitation through these confining units. Because of large differences of hydraulic conductivity between the confining units and the aquifer, the aquifer acts according to artesian principles. This is confirmed by the low coefficients of storage calculated from pumping tests (Whitfield, 1980, p. 6). Locally, confining units are absent, and water-table conditions prevail. In areas where confining units are thin, water-table conditions can prevail during periods of low water level.

The direction of ground-water flow under average conditions is similar to flow prior to and after construction of the lock and dam structure for most of the study area. However, the post-construction flow near and upstream from the structure is from the river to the aquifer, a reversal of the pre-construction gradient. The reversal of gradient occurs along the south side of the Red River in Avoyelles Parish, from 4 mi upstream of the structure to about 2 mi east of the Avoyelles-Rapides Parish boundary line. Potentiometric surface maps indicate the direction of flow is away from the river in a band about 3 mi wide when the direction becomes down valley. (See Smoot and Martin, 1991.)

The Red River alluvial aquifer is recharged by infiltration of rainfall in the valley, by lateral movement of water from adjacent hydrogeologic units of Pleistocene and Tertiary age, and by upward movement of water from underlying hydrogeologic units of Tertiary age. Also, the Red River and its major tributaries recharge the aquifer in local zones near the river during high stream stages (Whitfield, 1980, p. 1).

Higher average river stage resulting from the operation of Lock and Dam 1 near Vick, La., can cause higher ground-water levels in the alluvial aquifer. Relation between the higher stages of the river and water quality in the aquifer is not known at this time. However, in places where the water-level head in the Red River alluvial aquifer is higher than the underlying saltwater aquifer the

discharge from the underlying aquifer would be reduced. In these places the chloride concentration can decrease and the hardness and iron concentrations can increase.

DATA COLLECTION

Within the study area 15 observation wells located at 8 sites have been sampled periodically between 1974 and 1990. From 1974 through 1987 most of these wells were sampled two times per year; once in the spring (high water) and once in the fall (low water). From 1988 to 1990 these wells were sampled once in the spring. Five of these wells (Av-370, Av-372A, Ct-74, Ct-96 and R-963) also were sampled in 1991 and 1992. In addition to these 15 wells, two other wells (Av-331 and Av-339) were sampled three times during the period 1974-76, and were sampled two more times during the period 1988-89. Also, well R-733 has been sampled periodical since 1980, but was only sampled three times prior to the start of construction of the lock and dam, with two of these samples being collected in 1958.

All the water-quality samples were collected from observation wells, using a suction-type pump or by pumping with air. All the wells except Av-372A and Ct-96 are finished with 3-foot long screen with a slot size of 0.010 or 0.012 in. Wells Av-372A and Ct-96 are finished with 10- and 5-foot long screens. The samples were collected and processed according to standard methods established for ground-water sampling (American Public Health Association and others, 1980; Brown and others, 1970). Samples were filtered and acidified in the field for later analysis by a U.S. Geological Survey laboratory. Temperature and pH were determined in the field using procedures described by Wood (1976). Also field determination of alkalinity as calcium carbonate and specific conductance were determined on selected samples. Most of the water-quality samples were analyzed in the laboratory for selected properties and constituents, including total hardness as calcium carbonate and concentrations of dissolved calcium, magnesium, sulfate, chloride, iron, and manganese. The samples were analyzed according to standard methods established for determination of inorganic substances in water (Brown and others, 1970; Fishman and Friedman, 1989).

QUALITY OF WATER

The analyses for 18 wells completed in the Red River alluvial aquifer are presented in table 1 (at back of this report). Water-quality changes were evaluated for 17 of the 18 wells. Well R-733 was not evaluated because of insufficient data. Changes in total hardness and concentrations of dissolved chloride, iron, and manganese for these 18 wells are shown in graphs (figs. 2-19).

Data are missing for some wells because the screens were incrusted or the water levels in the wells were below the screen setting. Also, concentrations of dissolved iron and manganese are not shown when the sample was collected by pumping with air because aeration alters these constituents.

Median values of total hardness and median concentrations of dissolved chloride, iron, and manganese were calculated using data from pre-construction (1974-78) and post-construction (1984-92) sampling periods for 18 wells shown in figure 1. Given relatively small data sets, particularly during the post-construction sampling period, a median value gives a more representative time-averaged value than would a mean value, by minimizing the effect of outlying data points. A minimum of six data points were required to justify calculation of a median value. Data sets containing less than six points were insufficient for statistical analysis.

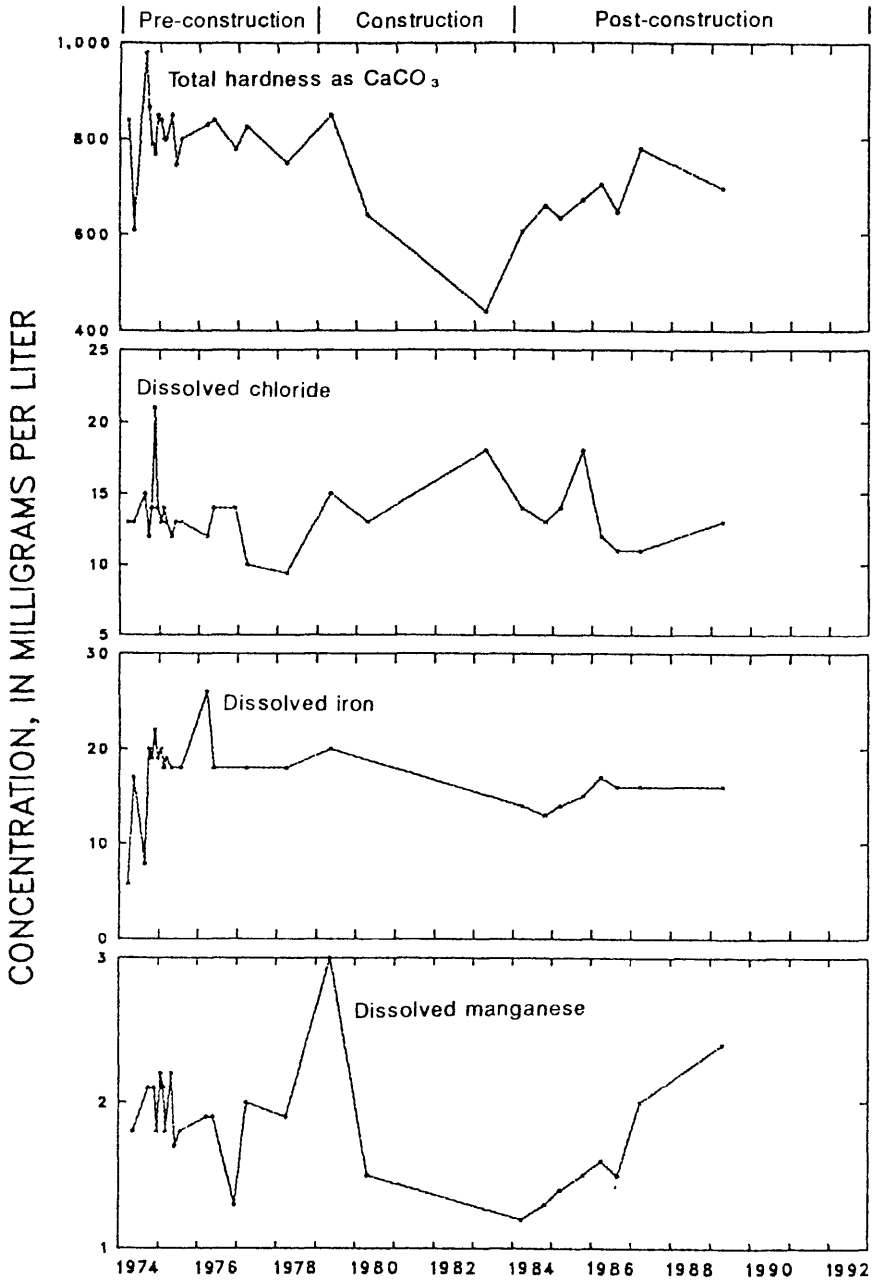


Figure 2. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-153 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

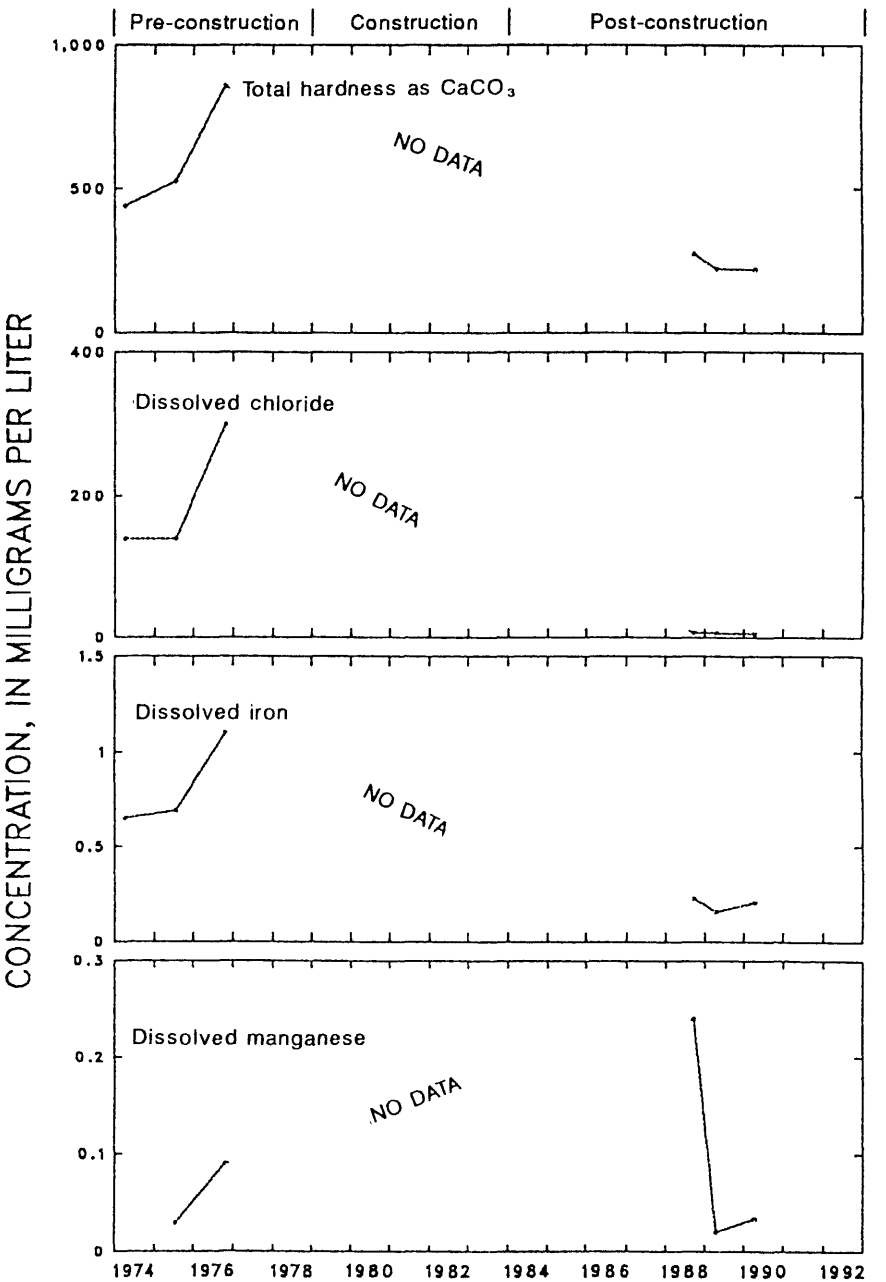


Figure 3. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-331 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

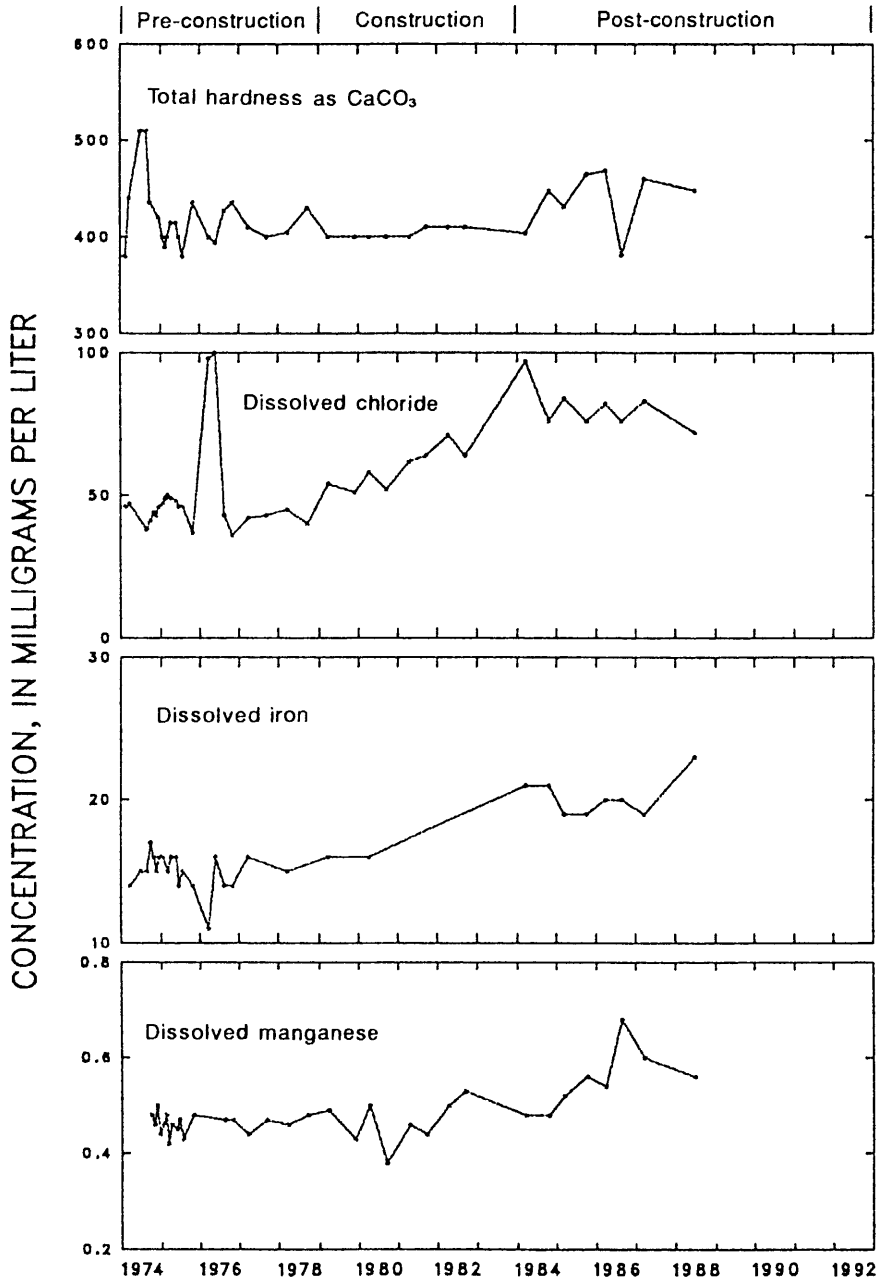


Figure 4. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-334 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

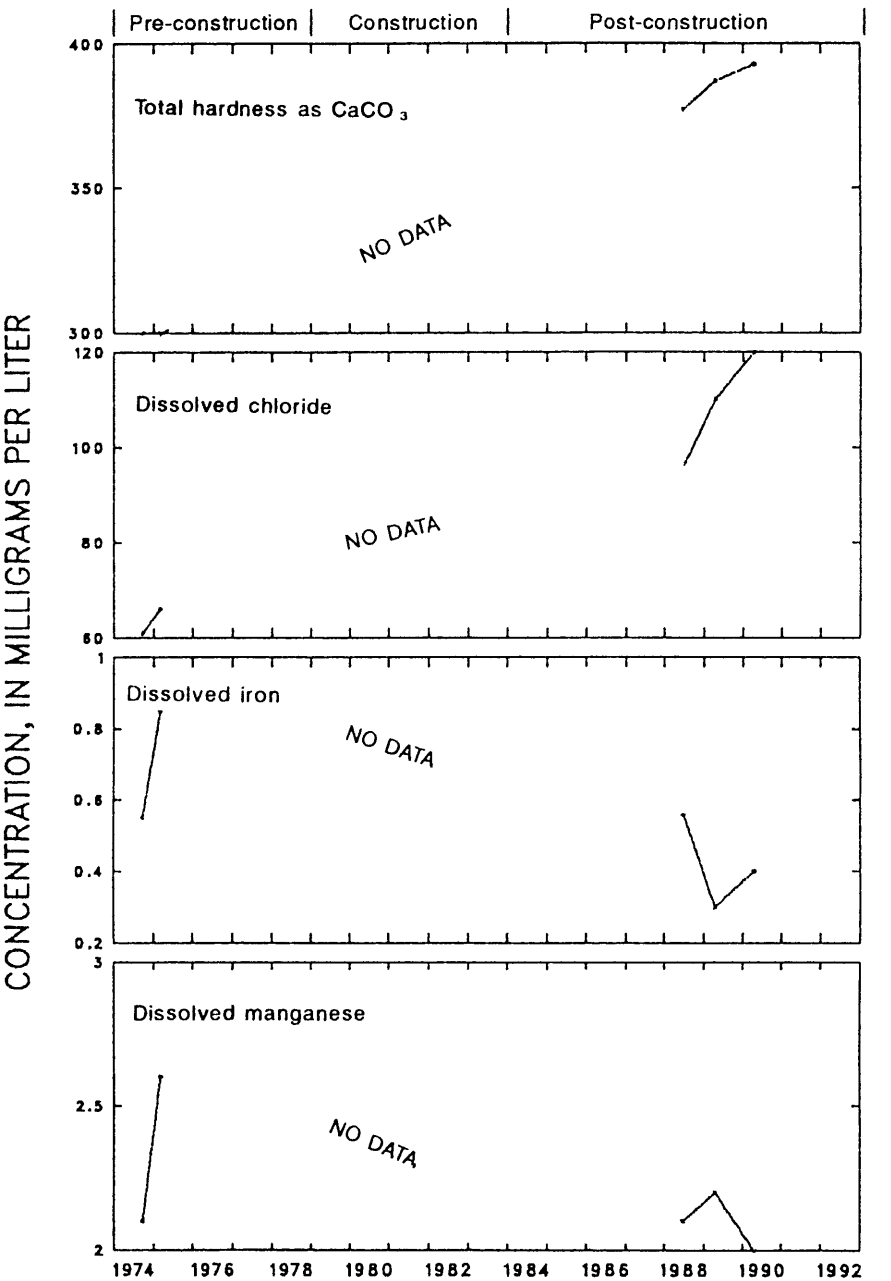


Figure 5. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-339 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

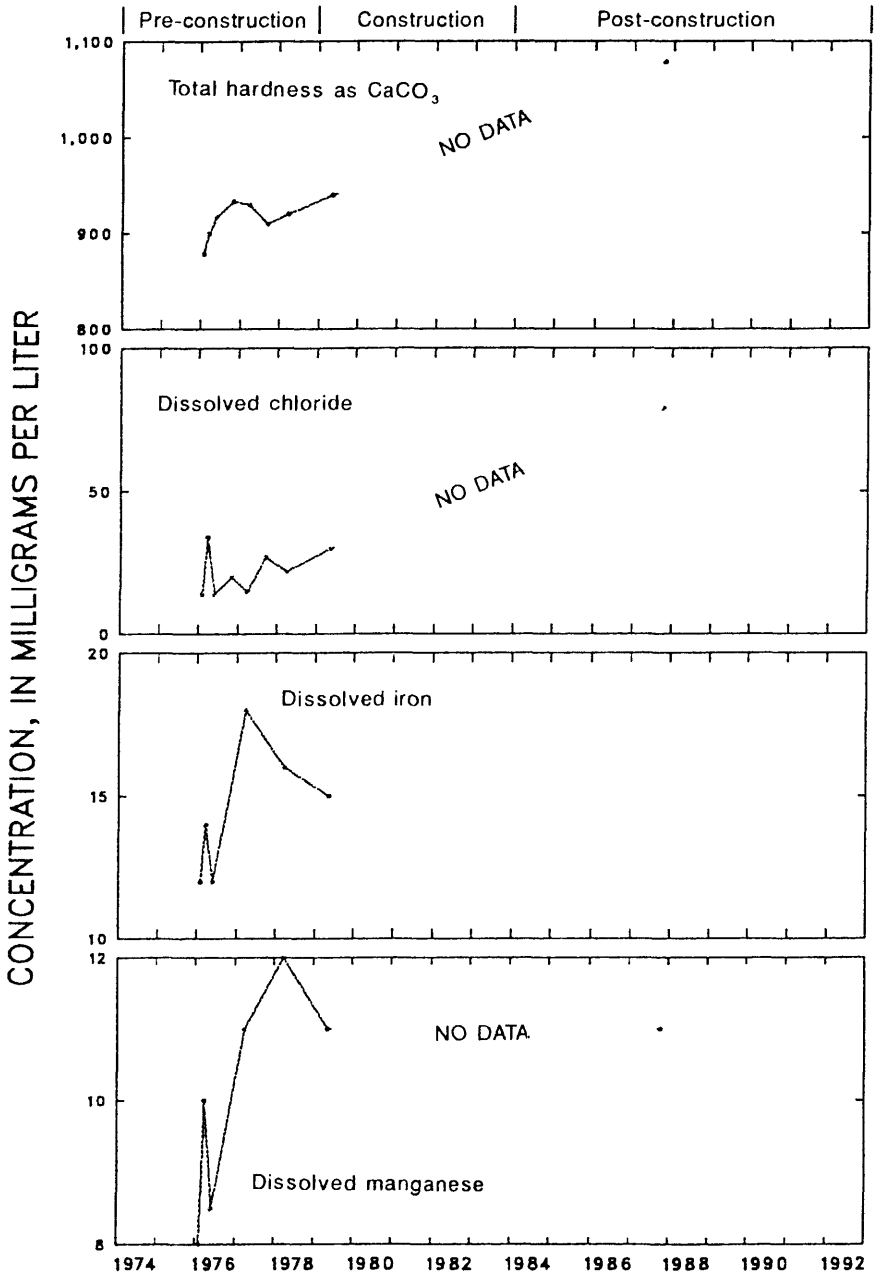


Figure 6. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-364 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

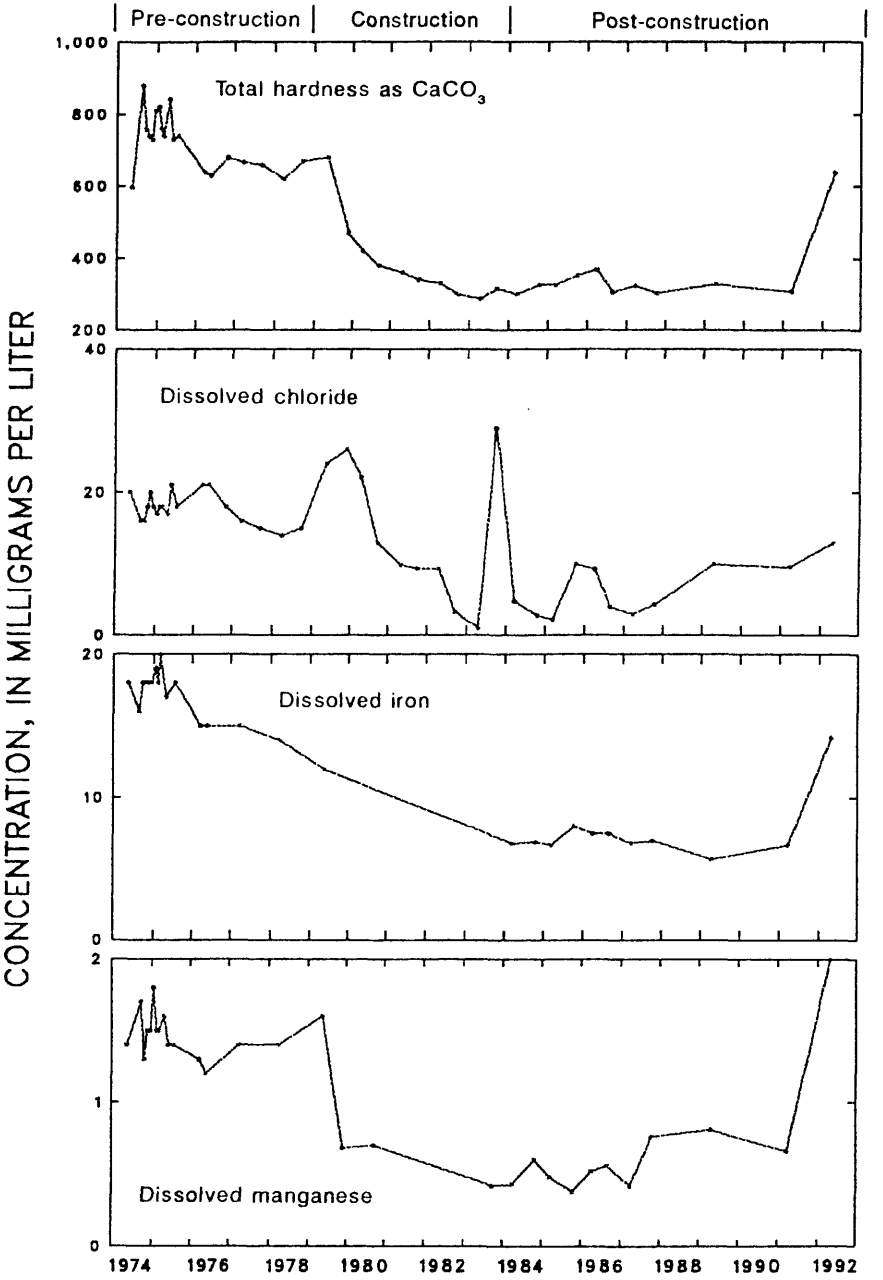


Figure 7. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-370 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

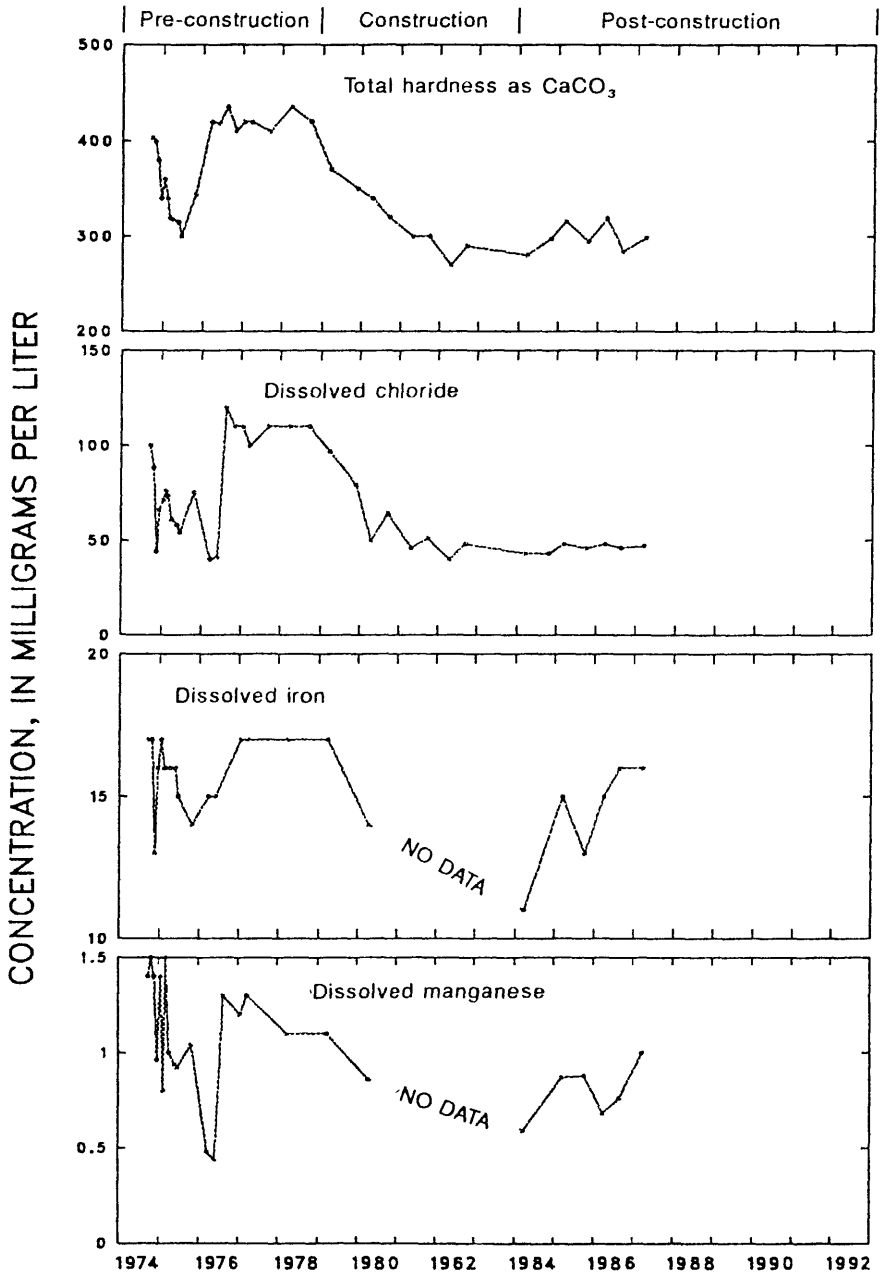


Figure 8. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-371 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

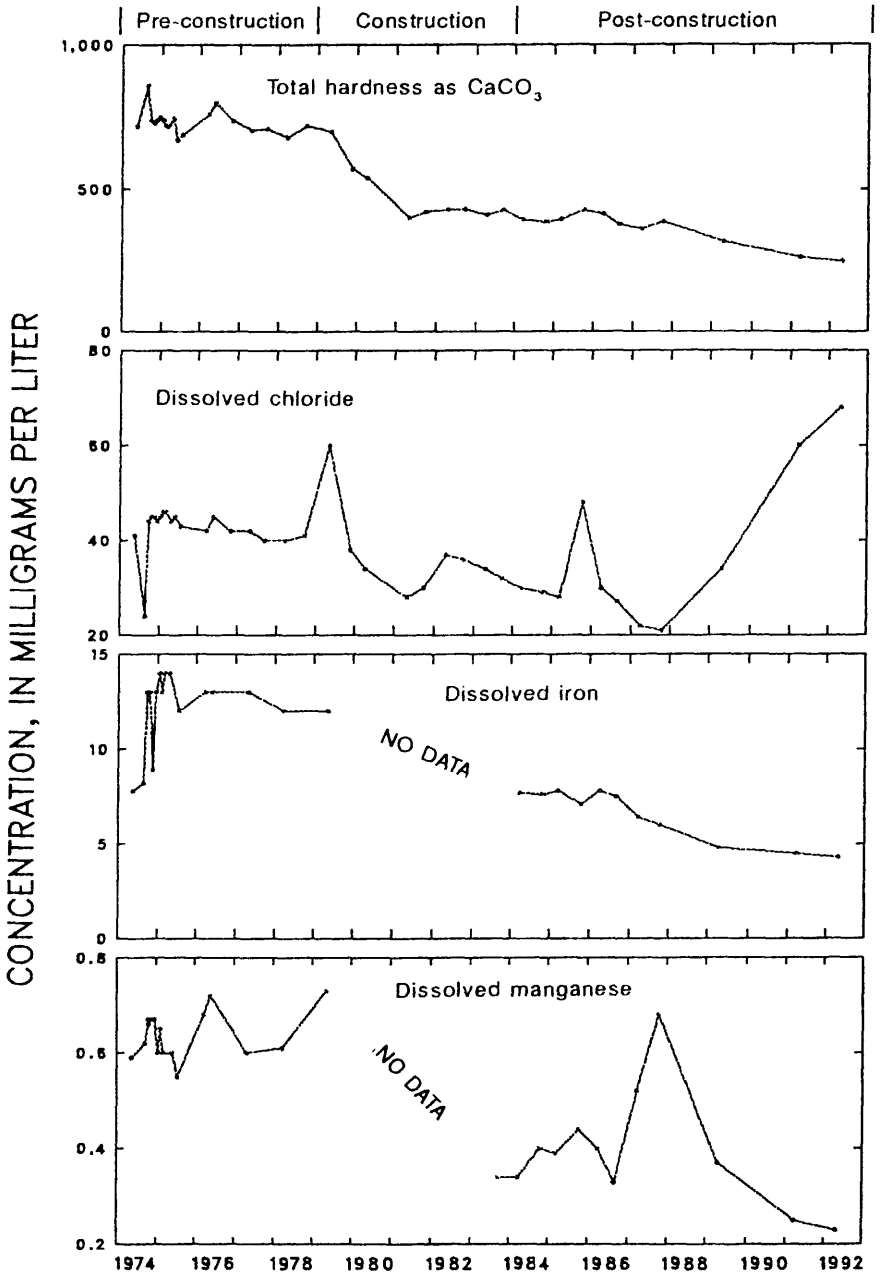


Figure 9. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-372A completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

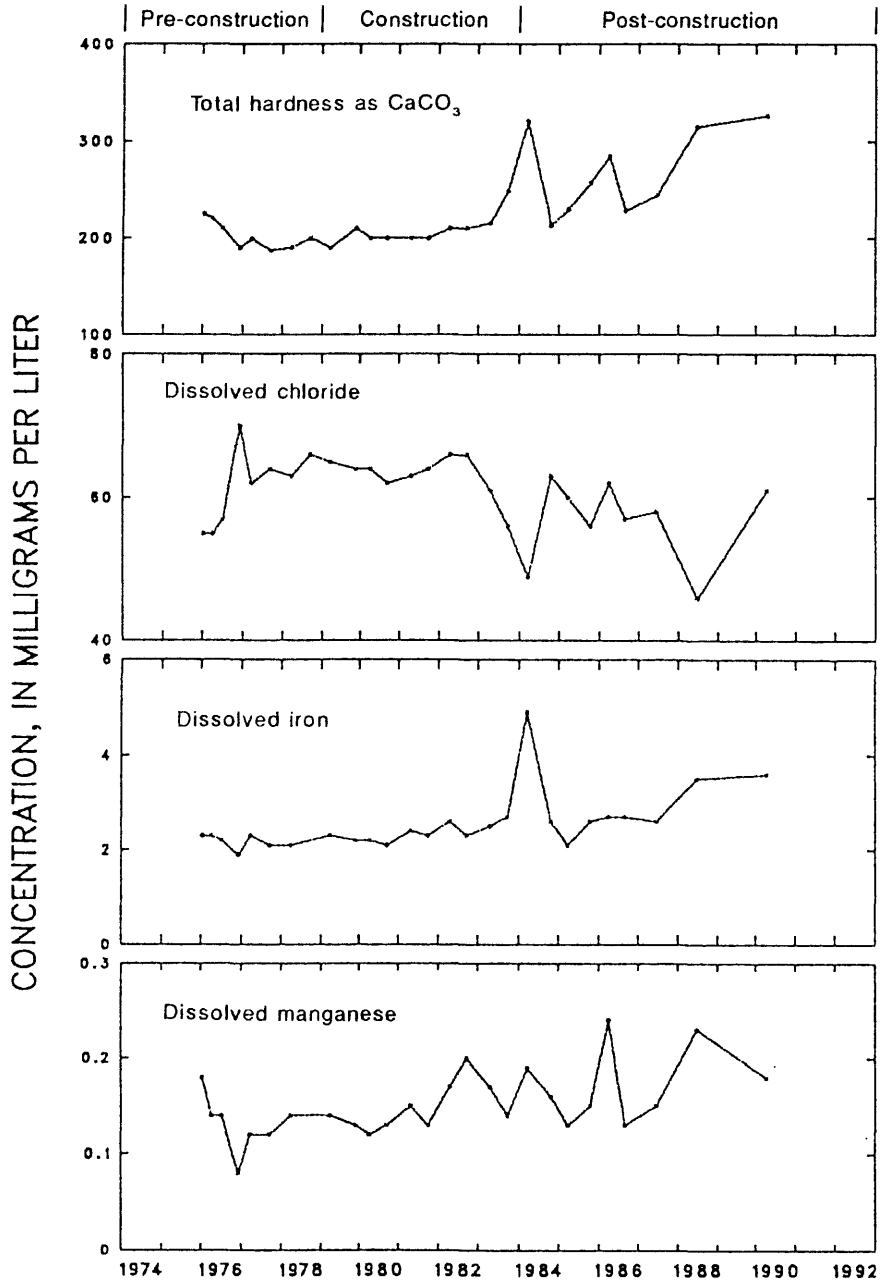


Figure 10. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-381 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

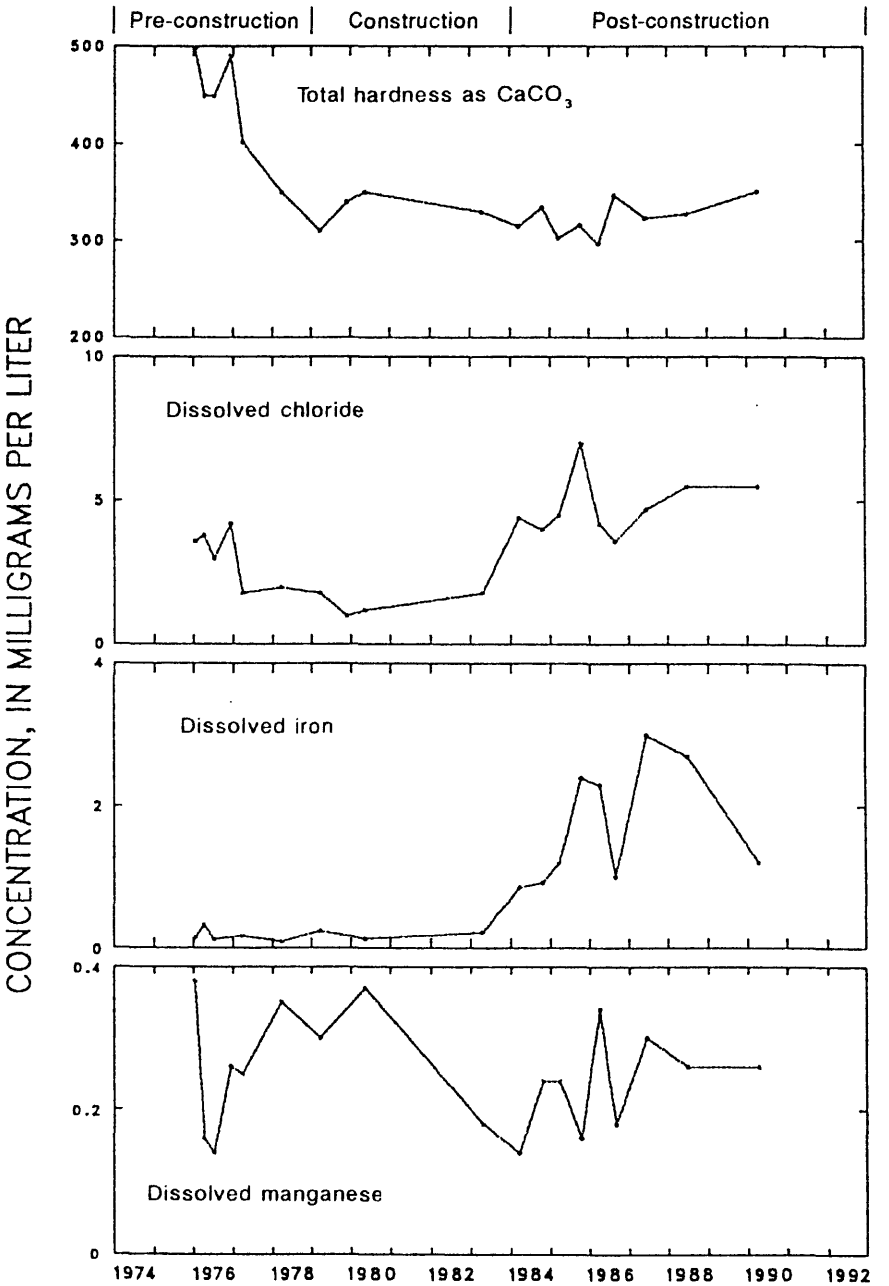


Figure 11. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Av-382 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

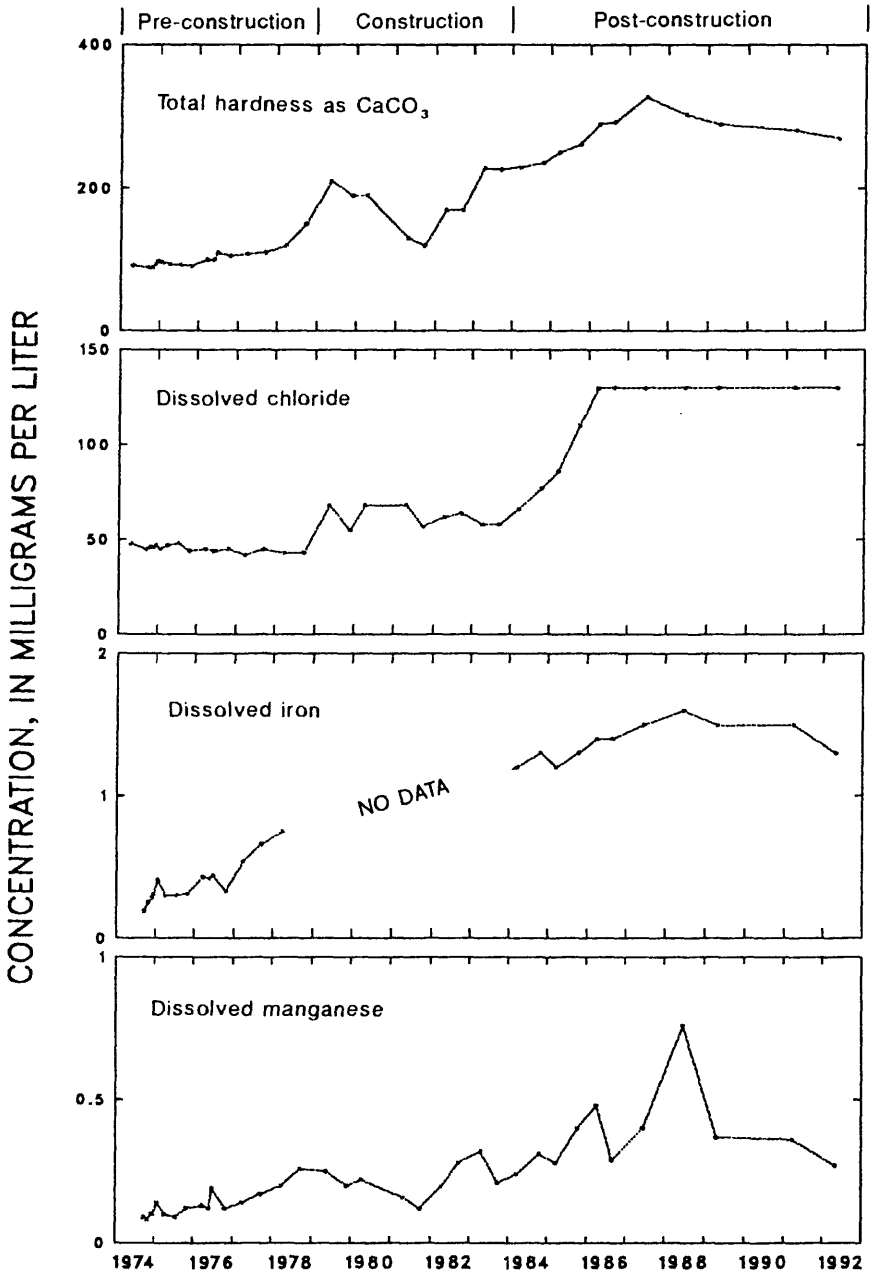


Figure 12. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Ct-74 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

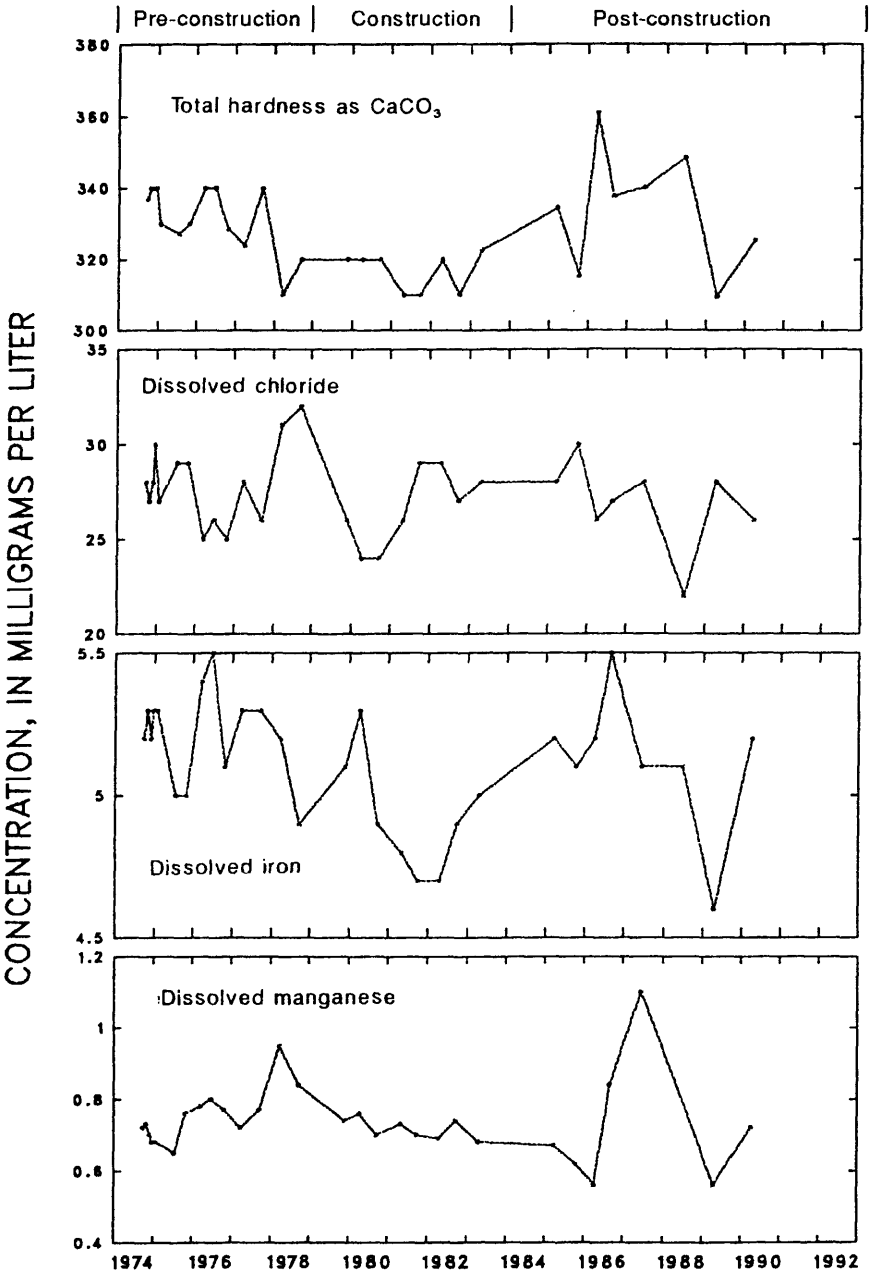


Figure 13. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Ct-75 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

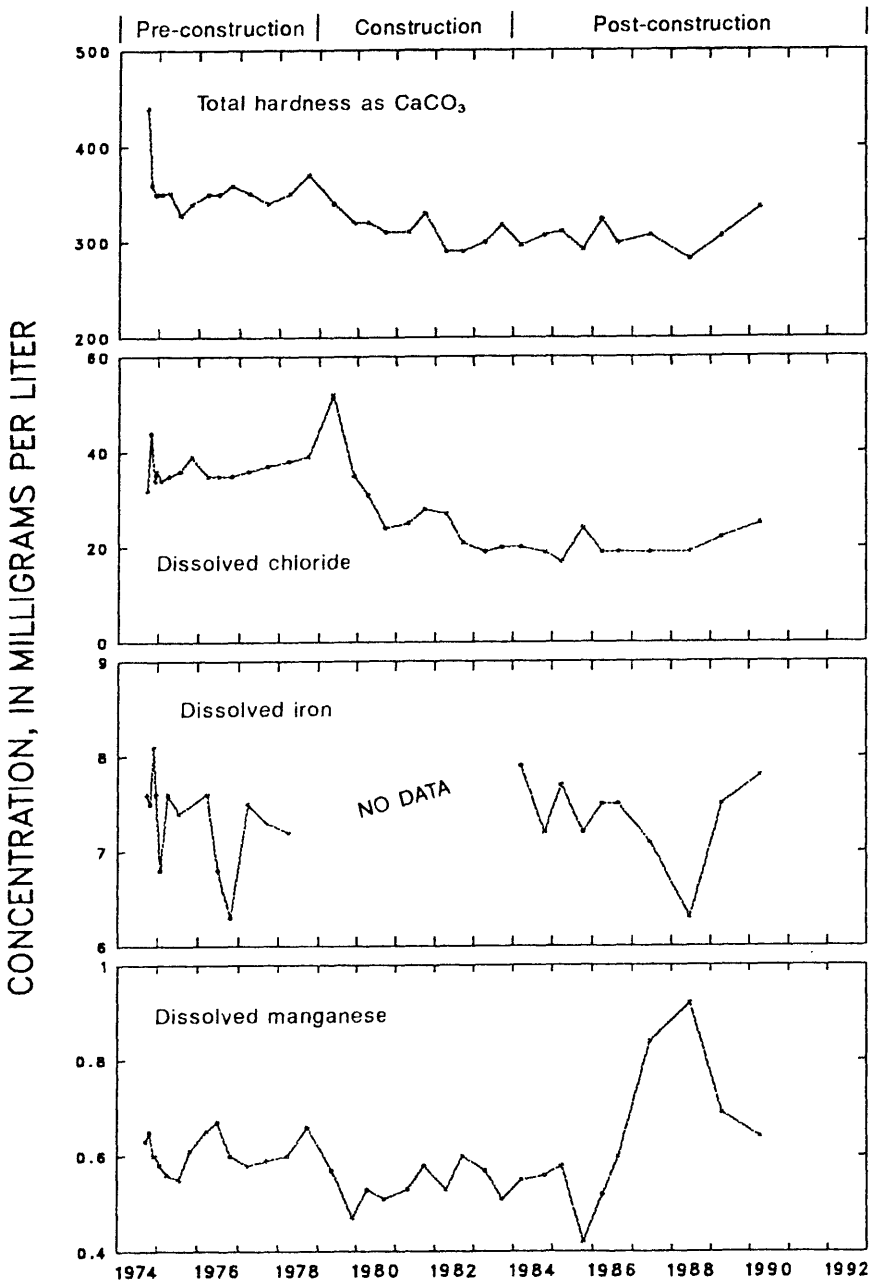


Figure 14. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Ct-81 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

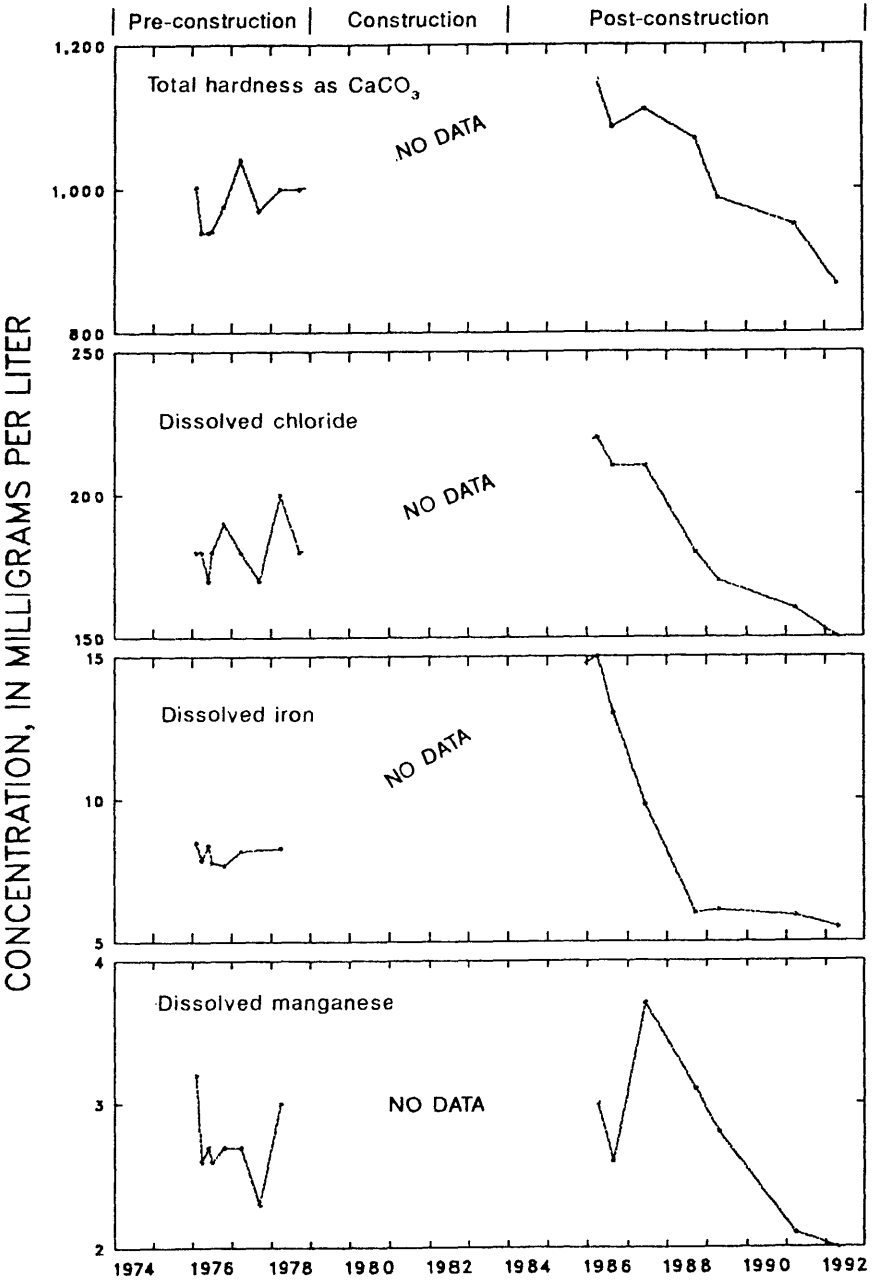


Figure 15. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well Ct-96 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

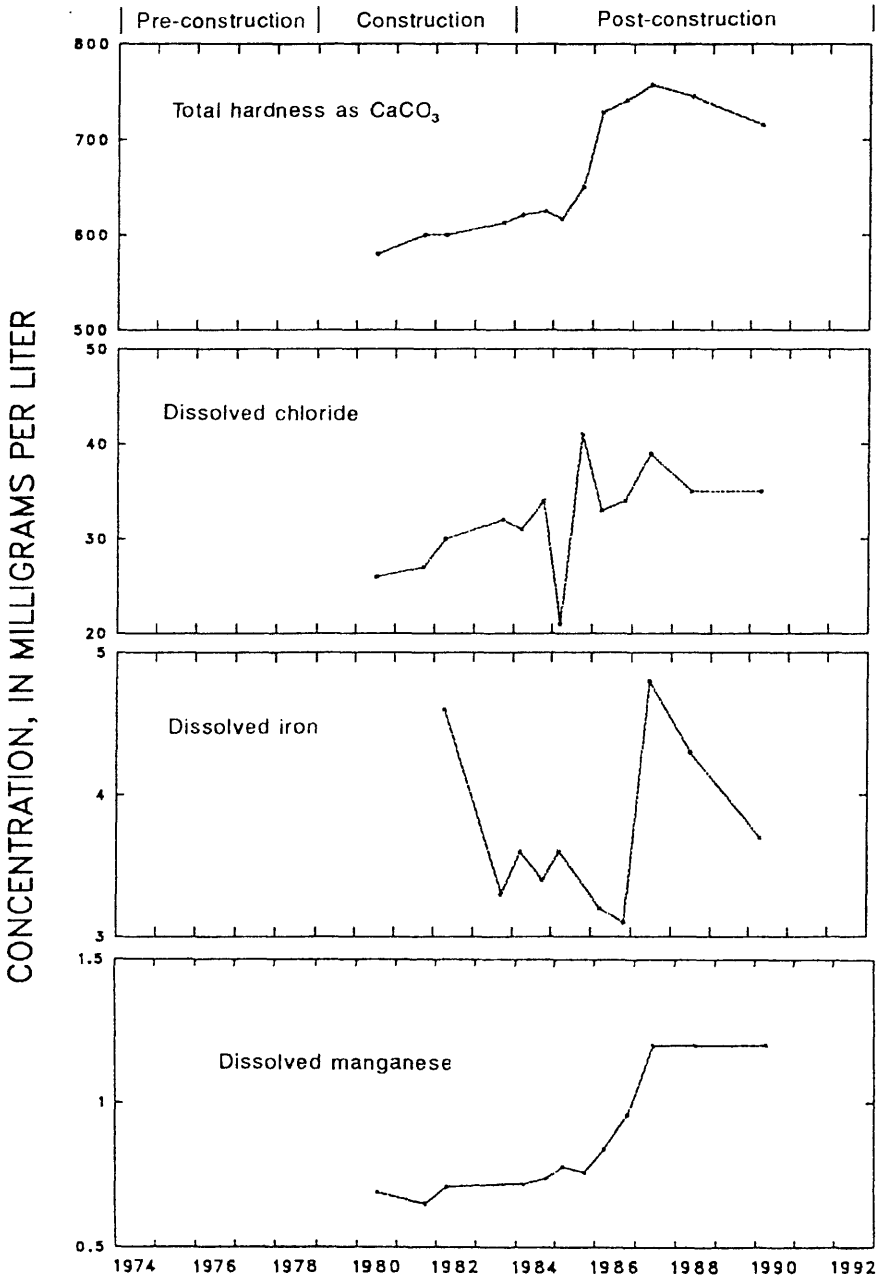


Figure 16. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well R-733 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

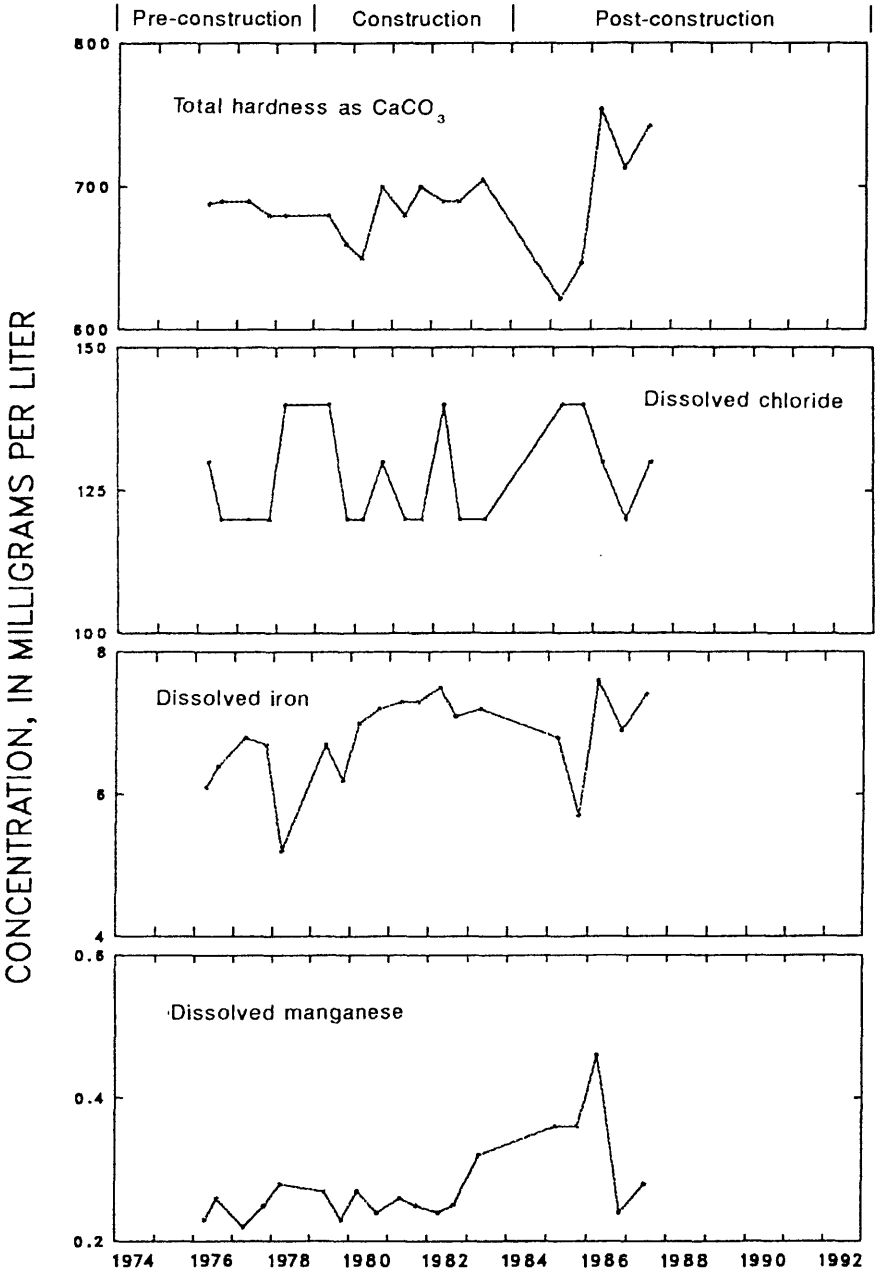


Figure 17. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well R-744 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

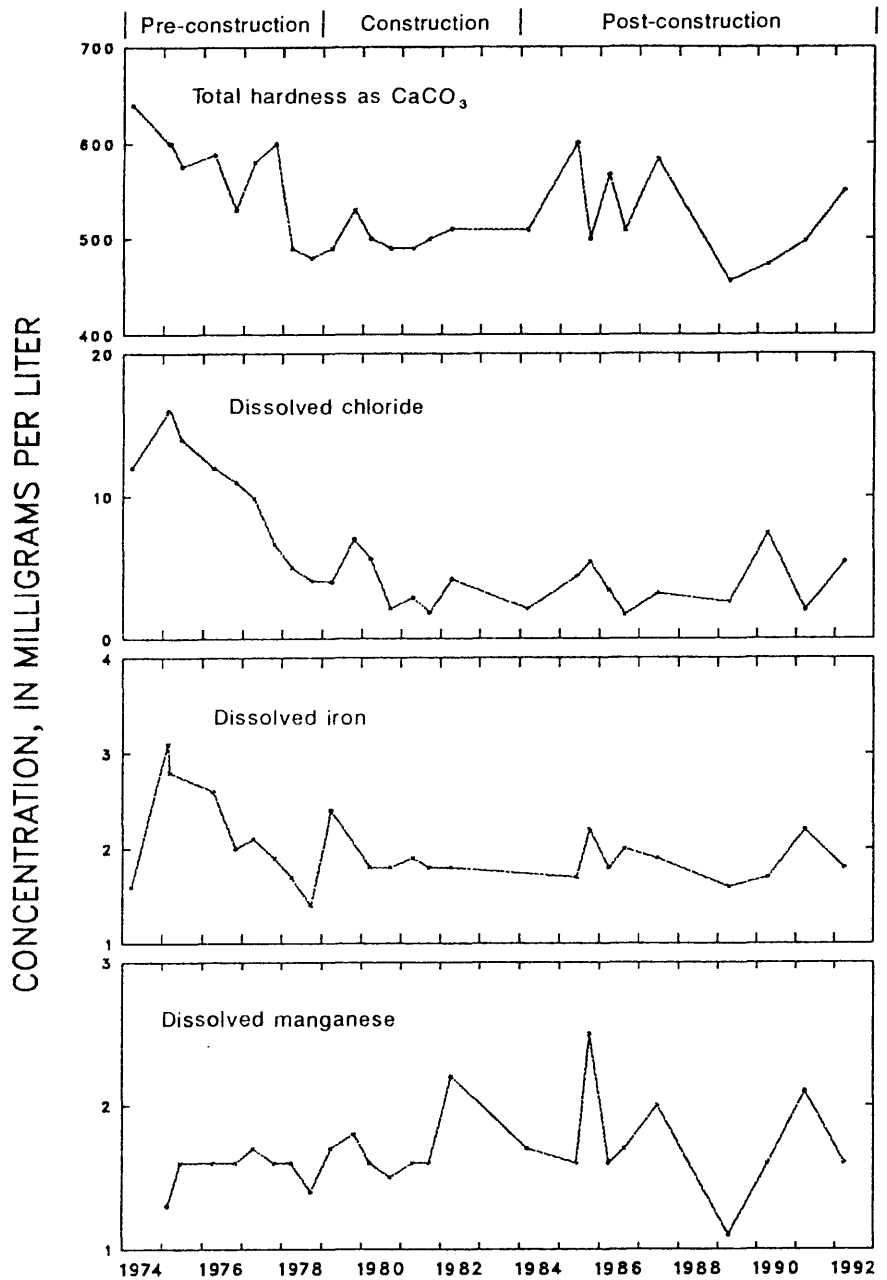


Figure 18. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well R-963 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

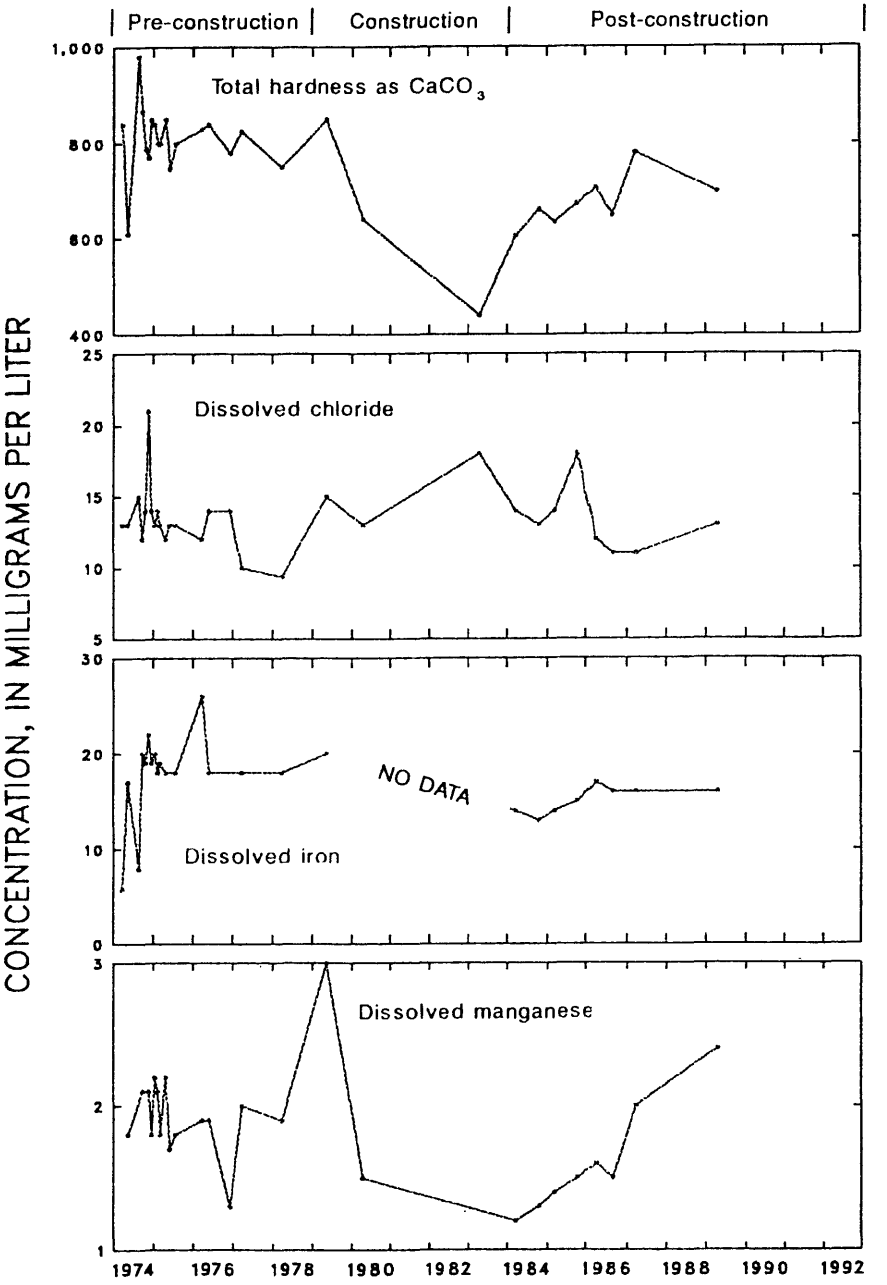


Figure 19. Total hardness and concentrations of dissolved chloride, iron, and manganese in water from well R-1102 completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

Table 2 lists well numbers, median values and concentrations, a range of values around the median value corresponding to the indicated confidence level, and the number of data points contained in the data sets for total hardness and dissolved chloride, iron, and manganese during pre-construction and post-construction sampling periods for most wells shown in figure 1. Because of insufficient data points, table 2 does not include wells Av-331, Av-339, R-733, and R-744. The target confidence level for calculated ranges around the median value in table 2 was 95 percent. Variability in the confidence level is inherent in the use of median rather than mean values. The technique used in calculating ranges around median values and in establishing the exact corresponding confidence levels listed in table 3 is discussed in greater detail by Iman and Conover (1983, p. 198-202).

The procedure used to establish documentable changes (an increase or decrease as shown in table 3) between pre-construction and post-construction sampling periods uses the calculated range of values around the median value shown in table 2. If the calculated ranges around the median values of pre-construction and post-construction sampling periods overlap, then no documentable difference exists between pre-construction and post-construction sampling periods. If the calculated ranges around the median values of pre-construction and post-construction sampling periods do not overlap and the median value of the post-construction sampling period is greater than the median value of the pre-construction sampling period then an increase (+ value in table 3) has occurred. If the calculated ranges around the median values of pre-construction and post-construction sampling periods do not overlap and the median value of the post-construction sampling period is less than the median value of the pre-construction sampling period then a decrease (- value in table 3) has occurred. In instances where a change has occurred between pre-construction and post-construction sampling periods, the magnitude of the change can be approximated by subtracting the pre-construction sampling period median value from the post-construction sampling period median value. This approach to statistical analysis of data is not applicable to data sets that show temporal trends. Data sets showing change between pre-construction and post-construction sampling periods and showing temporal trends in either pre-construction or post-construction sampling periods will be discussed on an individual basis.

The results of statistical analysis of total hardness and dissolved chloride, iron, and manganese data collected during pre-construction and post-construction sampling periods for wells shown in figure 1 are summarized in table 3. Table 3 lists 8 increases between pre-construction and post-construction sampling periods, 15 decreases between pre-construction and post-construction sampling periods, 27 instances of no documentable difference between pre-construction and post-construction sampling periods, and 18 instances of insufficient data on which to base a decision.

Total Hardness

Analyses of water from wells Av-381 (fig. 10) and Ct-74 (fig. 12) indicated increases and water from wells Av-153 (fig. 2), Av-370 (fig. 7), Av-371 (fig. 8), Av-372A (fig. 9), Av-382 (fig. 11), and Ct-81 (fig. 14) indicated decreases in the median hardness between pre-construction and post-construction sampling periods (table 3). Wells containing water that indicated a change and a no detectable difference in median hardness between pre-construction and post-construction sampling periods are shown in figure 20.

Analysis of water from well Ct-74 indicated an increasing temporal trend in hardness during the pre-construction and post-construction sampling periods. The trend began about 1976, continued into 1987, and became essentially constant through 1992. Wells Av-370 and Av-372A indicated a decreasing temporal trend in hardness during pre-construction and post-construction sampling periods. The trend began in about 1976 for well Av-372A and continued into 1992. The trend for

Table 2. Statistical analysis of total hardness and concentrations of dissolved chloride, iron, and manganese in water from selected wells completed in the Red River alluvial aquifer, during pre-construction (1974-78) and post-construction (1984-92) periods of Lock and Dam 1 on the Red River, Louisiana

[mg/L, milligrams per liter; N, number of points in data set; --, no data available]

Well no.	Pre-construction				Post-construction			
	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N
				Total hardness as calcium carbonate				
Av-153	815	780-840	96.92	18	665	630-700	92.96	8
Av-334	410	400-430	94.60	22	450	400-460	92.96	8
Av-364	920	880-930	98.44	7	--	--	--	1
Av-370	730	660-760	98.08	19	330	300-370	98.82	11
Av-371	400	340-420	95.86	20	300	280-320	98.44	7
Av-372A	730	710-750	98.08	19	380	260-410	98.82	11
Av-381	200	190-220	92.96	8	260	230-320	96.10	9
Av-382	450	400-490	96.88	6	320	300-350	96.10	9
Ct-74	98	93-110	95.10	17	280	240-300	98.82	11
Ct-75	335	330-340	94.26	14	335	320-350	92.96	8
Ct-81	350	350-360	96.48	15	310	290-320	97.86	10
Ct-96	980	940-1,000	96.10	9	1,100	870-1,200	98.44	7
R-963	585	490-600	97.86	10	510	470-580	97.86	10
R-1102	755	740-850	96.88	6	730	670-760	96.88	6

Table 2. Statistical analysis of total hardness and concentrations of dissolved chloride, iron, and manganese in water from selected wells completed in the Red River alluvial aquifer, during pre-construction (1974-78) and post-construction (1984-92) periods of Lock and Dam 1 on the Red River, Louisiana--Continued

Well no.	Pre-construction				Post-construction			
	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N
				Dissolved chloride				
Av-153	13	12-14	96.92	18	13	11-14	92.96	8
Av-334	45.5	43-47	93.50	24	79	76-84	92.96	8
Av-364	20	14-34	98.44	7	--	--	--	1
Av-370	18	16-20	98.08	19	4.8	2.8-10	98.82	11
Av-371	77.5	61-110	95.86	20	46	43-48	98.44	7
Av-372A	44	41-45	98.08	19	30	22-60	98.82	11
Av-381	62.5	55-66	92.96	8	58	49-62	96.10	9
Av-382	3.3	1.8-4.2	96.88	6	4.5	4.0-5.5	96.10	9
Ct-74	45	44-46	95.10	17	130	77-130	98.82	11
Ct-75	28	26-29	94.26	14	27.5	26-28	92.96	8
Ct-81	36	35-38	96.48	15	19	19-24	97.86	10
Ct-96	180	170-190	96.10	9	180	150-220	98.44	7
R-963	11.5	5.0-16	97.86	10	3.3	2.0-5.4	97.86	10
R-1102	140	140-160	96.88	6	125	120-140	96.88	6

Table 2. Statistical analysis of total hardness and concentrations of dissolved chloride, iron, and manganese in water from selected wells completed in the Red River alluvial aquifer, during pre-construction (1974-78) and post-construction (1984-92) periods of Lock and Dam 1 on the Red River, Louisiana--Continued

Well no.	Pre-construction				Post-construction			
	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N
				Dissolved iron				
Av-153	18	18-20	97.88	16	15.5	14-16	92.96	8
Av-334	15	14-16	97.10	21	20	19-21	92.96	8
Av-364	--	--	--	5	--	--	--	0
Av-370	18	15-18	96.48	15	6.9	6.7-8.0	98.82	11
Av-371	16	15-17	97.88	16	15	11-16	96.88	6
Av-372A	13	12-13	96.48	15	7.1	4.5-7.8	98.82	11
Av-381	2.2	1.9-2.3	98.44	7	2.7	2.6-3.6	96.10	9
Av-382	--	--	--	5	1.2	.92-2.7	96.10	9
Ct-74	.33	.30-.44	96.48	15	1.4	1.2-1.5	98.82	11
Ct-75	5.25	5.1-5.3	94.26	14	5.15	5.1-5.2	92.96	8
Ct-81	7.5	6.8-7.6	97.76	13	7.5	7.1-7.8	97.86	10
Ct-96	8.2	7.7-8.5	98.44	7	6.1	5.5-15	98.44	7
R-744	--	--	--	5	--	--	--	5
R-963	2.0	1.6-2.8	96.10	9	1.8	1.7-2.2	96.10	9
R-1102	--	--	--	5	6.85	6.1-7.2	96.88	6

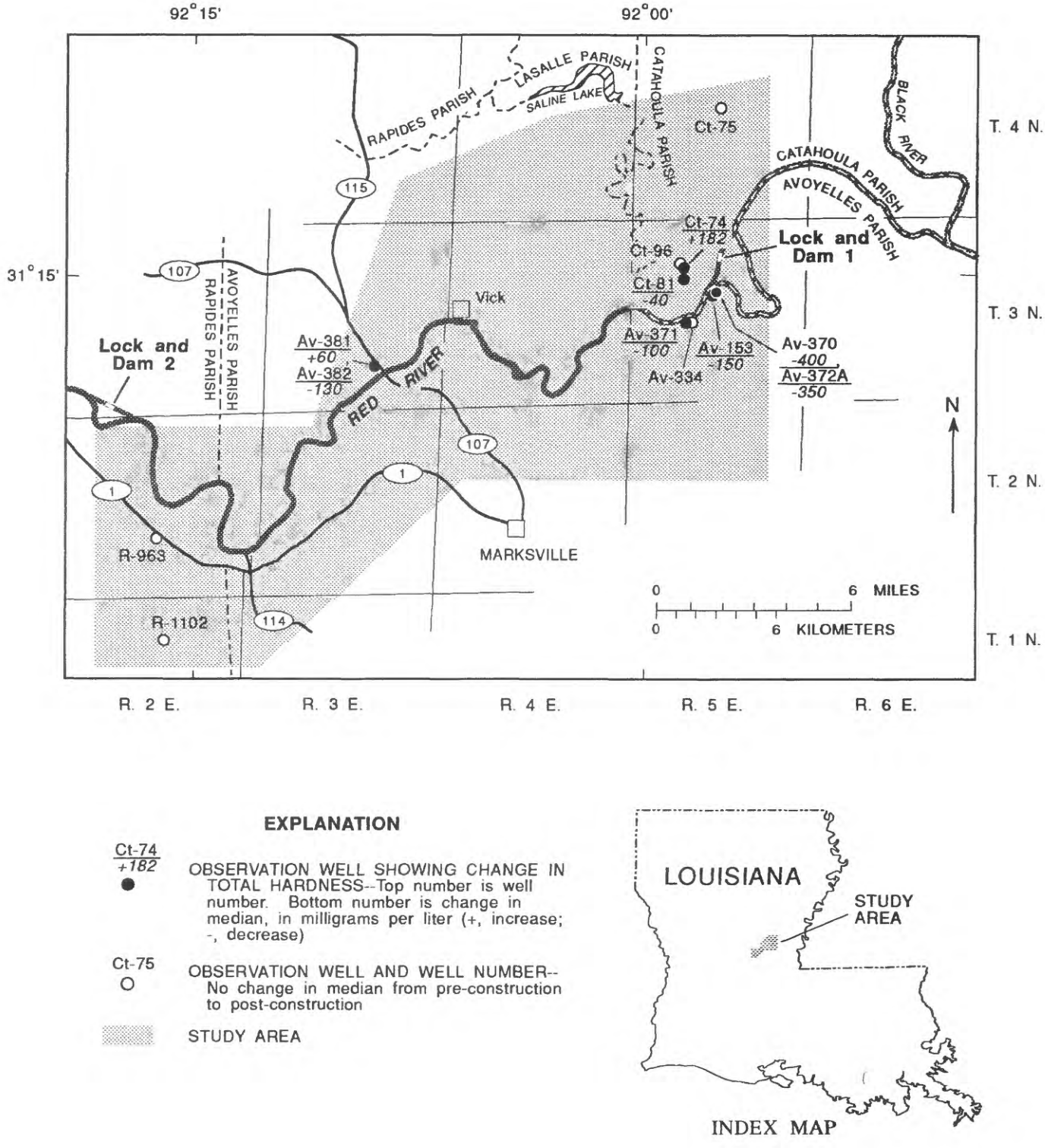
Table 2. Statistical analysis of total hardness and concentrations of dissolved chloride, iron, and manganese in water from selected wells completed in the Red River alluvial aquifer, during pre-construction (1974-78) and post-construction (1984-92) periods of Lock and Dam 1 on the Red River, Louisiana--Continued

Well no.	Pre-construction				Post-construction			
	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N	Median value (mg/L)	Median range (mg/L)	Confidence level (95 percent)	N
				Dissolved manganese				
Av-153	1.9	1.8-2.1	96.48	15	1.55	1.3-2.0	92.96	8
Av-334	.465	.45-.48	96.92	18	.55	.48-.60	92.96	8
Av-364	--	--	--	5	--	--	--	1
Av-370	1.4	1.4-1.5	96.48	15	.56	.42-.81	98.82	11
Av-371	1.1	.94-1.4	95.10	17	.815	.59-1.0	96.88	6
Av-372A	.615	.60-.67	94.26	14	.39	.25-.52	98.82	11
Av-381	.14	.08-.18	98.44	7	.16	.13-.23	96.10	9
Av-382	.255	.14-.38	96.88	6	.24	.16-.30	96.10	9
Ct-74	.12	.10-.17	97.88	16	.36	.27-.48	98.82	11
Ct-75	.745	.70-.78	94.26	14	.67	.56-1.10	98.44	7
Ct-81	.60	.58-.65	96.48	15	.59	.52-.84	97.86	10
Ct-96	2.7	2.6-3.0	92.96	8	2.8	2.1-3.7	98.44	7
R-963	1.6	1.4-1.6	92.96	8	1.65	1.6-2.1	97.86	10
R-1102	.205	.20-.23	96.88	6	.34	.18-.52	96.88	6

Table 3. Summary of changes in median values of total hardness and median concentrations of dissolved chloride, iron, and manganese in water from selected wells completed in the Red River alluvial aquifer from pre-construction (1974-78) to post-construction (1984-92) periods of Lock and Dam 1 on the Red River, Louisiana

[Concentrations are in milligrams per liter; N, no; Y, yes; I, insufficient data; --, no value calculated; *, no documentable difference]

Well no.	Total hardness as calcium carbonate		Dissolved chloride		Dissolved iron		Dissolved manganese	
	Documentable difference	Post-construction median concentration less pre-construction median	Documentable difference	Post construction median concentration less pre-construction median	Documentable difference	Post construction median concentration less pre-construction median	Documentable difference	Post construction median concentration less pre-construction median
Av-153	Y	-150	N	*	Y	-2.5	N	*
Av-331	I	--	I	--	I	--	I	--
Av-334	N	*	Y	+33.5	Y	+5	N	*
Av-339	I	--	I	--	I	--	I	--
Av-364	I	--	I	--	I	--	I	--
Av-370	Y	-400	Y	-13.2	Y	-11.1	Y	-0.84
Av-371	Y	-100	Y	-31.5	N	*	N	*
Av-372A	Y	-350	Y	-14	Y	-5.9	Y	-.225
Av-381	Y	+60	N	*	Y	+.5	N	*
Av-382	Y	-130	N	*	I	--	N	*
Ct-74	Y	+182	Y	+85	Y	+1.07	Y	+.24
Ct-75	N	*	N	*	N	*	N	*
Ct-81	Y	-40	Y	-17	N	*	N	*
Ct-96	N	*	N	*	N	*	N	*
R-733	I	--	I	--	I	--	I	--
R-744	I	--	I	--	I	--	I	--
R-963	N	*	N	*	N	*	N	*
R-1102	N	*	N	*	I	--	N	*



EXPLANATION

Ct-74 +182 ● — OBSERVATION WELL SHOWING CHANGE IN TOTAL HARDNESS--Top number is well number. Bottom number is change in median, in milligrams per liter (+, increase; -, decrease)

Ct-75 ○ — OBSERVATION WELL AND WELL NUMBER--No change in median from pre-construction to post-construction

STUDY AREA

Figure 20. Changes in median values of total hardness of water from wells completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

well Av-370 continued into 1991, but in 1992 the hardness had increased to almost the pre-construction level. Well Av-382 indicated a decreasing temporal trend in hardness during the pre-construction sampling period; the trend began in about 1976 and continued into 1978. The presence of temporal trends in pre-construction and post-construction sampling periods for hardness indicates that hydrologic factors other than the construction of Lock and Dam 1 have affected hardness in wells Ct-74, Av-372A, and Av-382.

Excluding wells Ct-74, Av-372A, and Av-382, data for four wells south of Lock and Dam 1 indicated decreases in hardness between pre-construction and post-construction sampling periods. Data for well Av-381, located about 10 mi west and about 2.5 mi south of Lock and Dam 1, indicated an increase in hardness between pre-construction and post-construction periods.

Dissolved Chloride

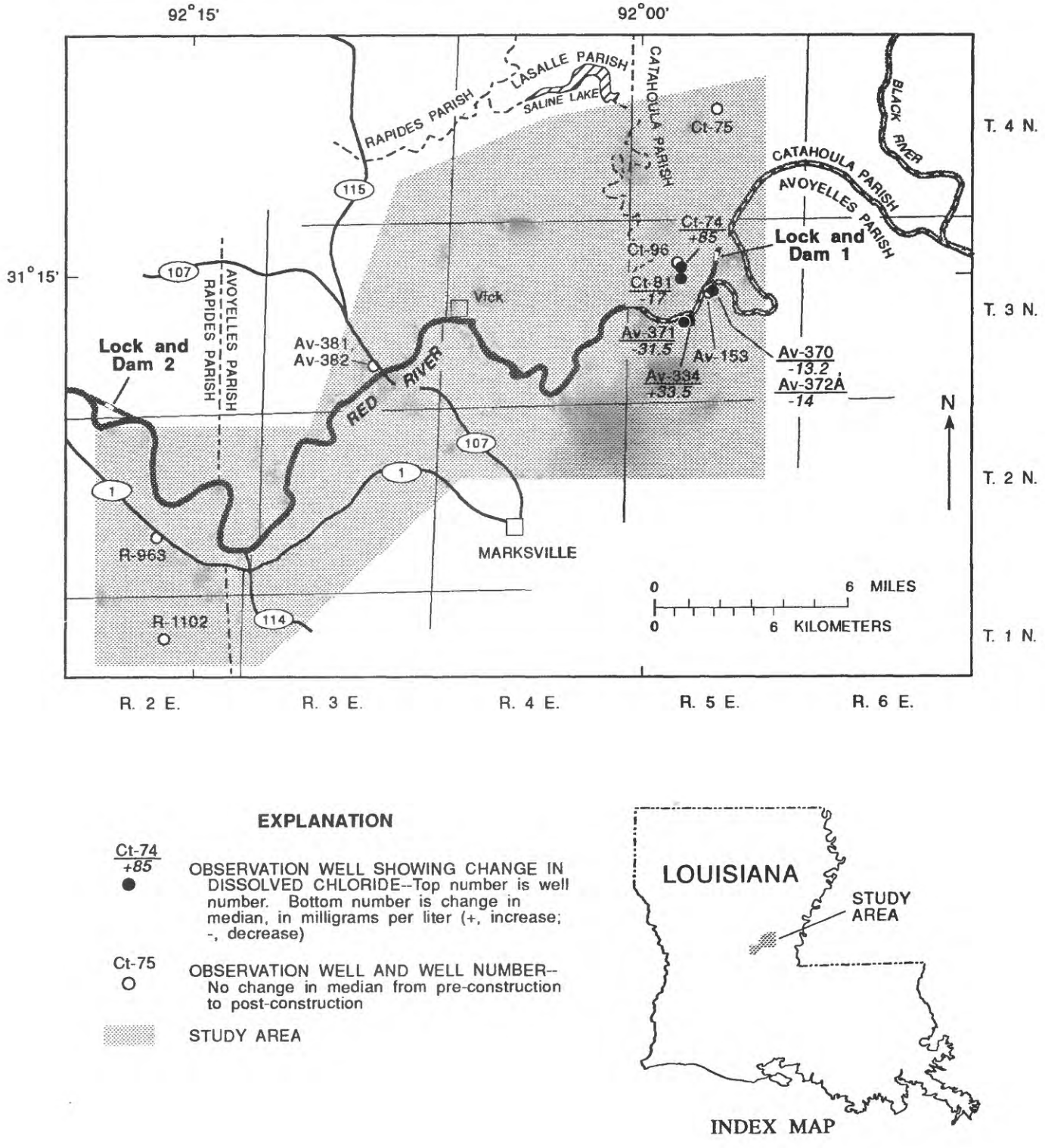
Analyses of water from wells Av-334 (fig. 4) and Ct-74 (fig. 12) indicated increases and water from wells Av-370 (fig. 7), Av-371 (fig. 8), Av-372A (fig. 9), and Ct-81 (fig. 14) indicated decreases in the median concentration of dissolved chloride between pre-construction and post-construction sampling periods. Wells containing water that indicated a change and a no detectable difference in the median concentration of dissolved chloride between pre-construction and post-construction sampling periods are shown in figure 21.

Analysis of water from well Av-372A indicated a decreasing temporal trend in the concentration of dissolved chloride during the pre-construction and post-construction sampling periods. The trend began about 1976 and continued into 1987, but indicated an increasing trend from 1989 to 1992. The presence of a temporal trend during pre-construction and post-construction sampling periods for chloride indicates that hydrologic factors other than the construction of Lock and Dam 1 have affected the concentration of dissolved chloride in well Av-372A.

Only wells within about 2 mi of Lock and Dam 1 indicated changes in the concentration of dissolved chloride between pre-construction and post-construction sampling periods. One well to the north of Lock and Dam 1 indicated an increase in the concentration of dissolved chloride between pre-construction and post-construction sampling periods. Excluding well Av-372A, three wells south of Lock and Dam 1 indicated decreases and one well south of Lock and Dam 1 indicated an increase in the concentration of dissolved chloride between pre-construction and post-construction sampling periods. Some of the increases in dissolved chloride concentrations probably are due to upconing of saltwater from underlying sands of Tertiary age caused by the water level in the alluvial aquifer being lowered about 40 ft (table 1) due to dewatering of wells during the construction of Lock and Dam 1.

Dissolved Iron

Median concentrations of dissolved iron in water from wells Av-334 (fig. 4), Av-381 (fig. 10), and Ct-74 (fig. 12) indicated increases and wells Av-153 (fig. 2) and Av-372A (fig. 9) indicated decreases between analyses for pre-construction and post-construction sampling periods. Wells containing water that indicated a change and a no detectable difference in the median concentration of dissolved iron between pre-construction and post-construction sampling periods are shown in figure 22.



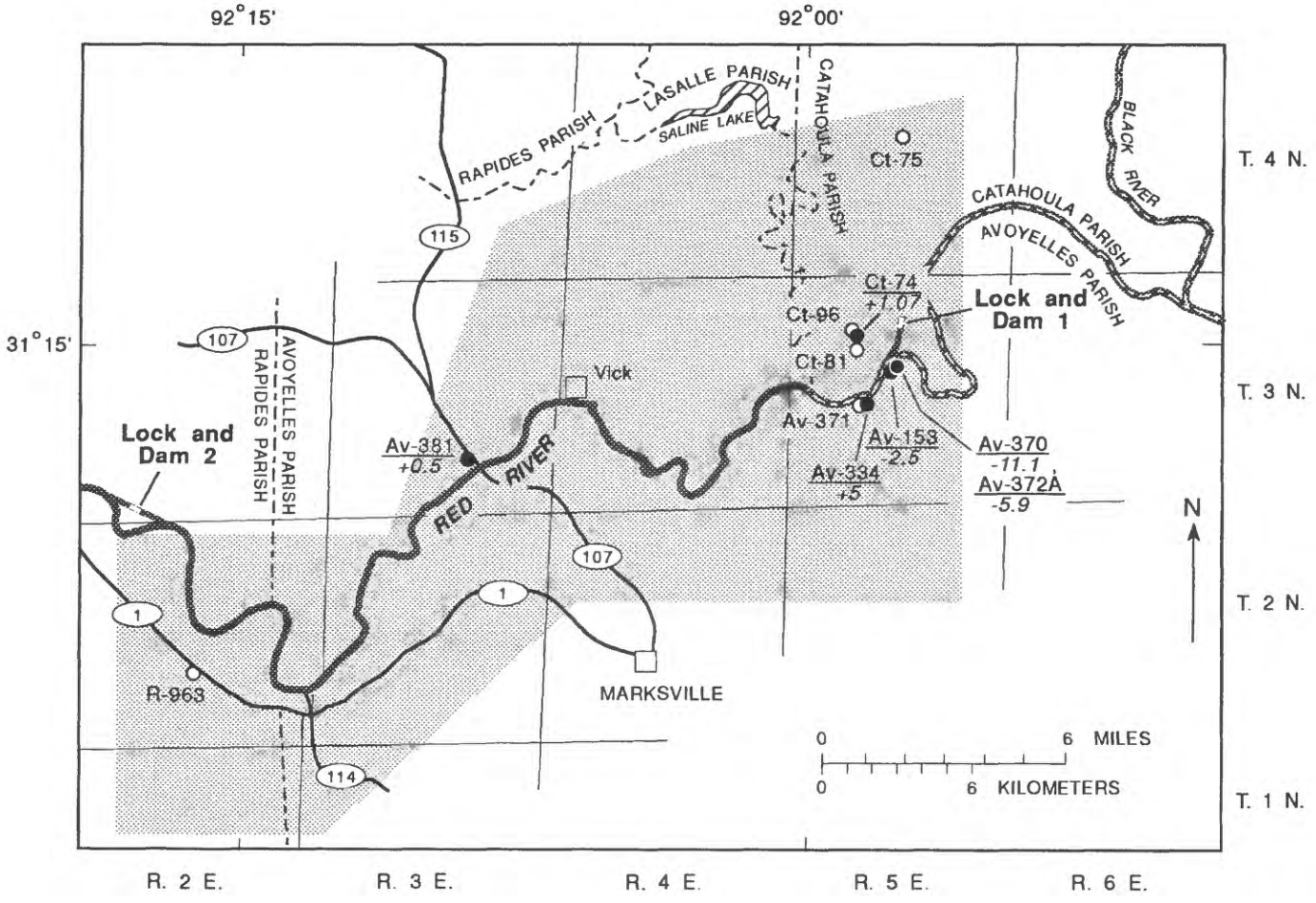
EXPLANATION

Ct-74 / +85 ● — OBSERVATION WELL SHOWING CHANGE IN DISSOLVED CHLORIDE--Top number is well number. Bottom number is change in median, in milligrams per liter (+, increase; -, decrease)

Ct-75 ○ — OBSERVATION WELL AND WELL NUMBER-- No change in median from pre-construction to post-construction

STUDY AREA

Figure 21. Changes in median concentration of dissolved chloride in water from wells completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.



EXPLANATION

Ct-74 / +1.07 ● — OBSERVATION WELL SHOWING CHANGE IN DISSOLVED IRON--Top number is well number. Bottom number is change in median, in milligrams per liter (+, increase; -, decrease)

Ct-75 ○ — OBSERVATION WELL AND WELL NUMBER--No change in median from pre-construction to post-construction

STUDY AREA

Figure 22. Changes in median concentration of dissolved iron in water from wells completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

Water analyses for well Av-370 (fig. 7) indicated a decrease in the concentration of dissolved iron between pre-construction and post-construction. However, the iron concentration increased, from a low in 1989, to a level in 1992 comparable with the pre-construction level. Data for well Av-381 indicated considerable variation in the concentration of dissolved iron during the post-construction sampling period. While there is an apparent increase in the post-construction concentrations of dissolved iron from the pre-construction concentrations of dissolved iron, particularly in samples collected in 1988 and 1990, the differences in median concentrations between pre-construction and post-construction sampling periods should be interpreted with caution. Data for well Ct-74 indicated an increasing temporal trend in the concentration of dissolved iron during the pre-construction and post-construction sampling periods, which began about 1977, continued into 1989, and became essentially constant through 1992. The presence of a temporal trend in pre-construction and post-construction sampling periods for iron indicates that hydrologic factors other than the construction of Lock and Dam 1 have affected the concentration of dissolved iron in well Ct-74.

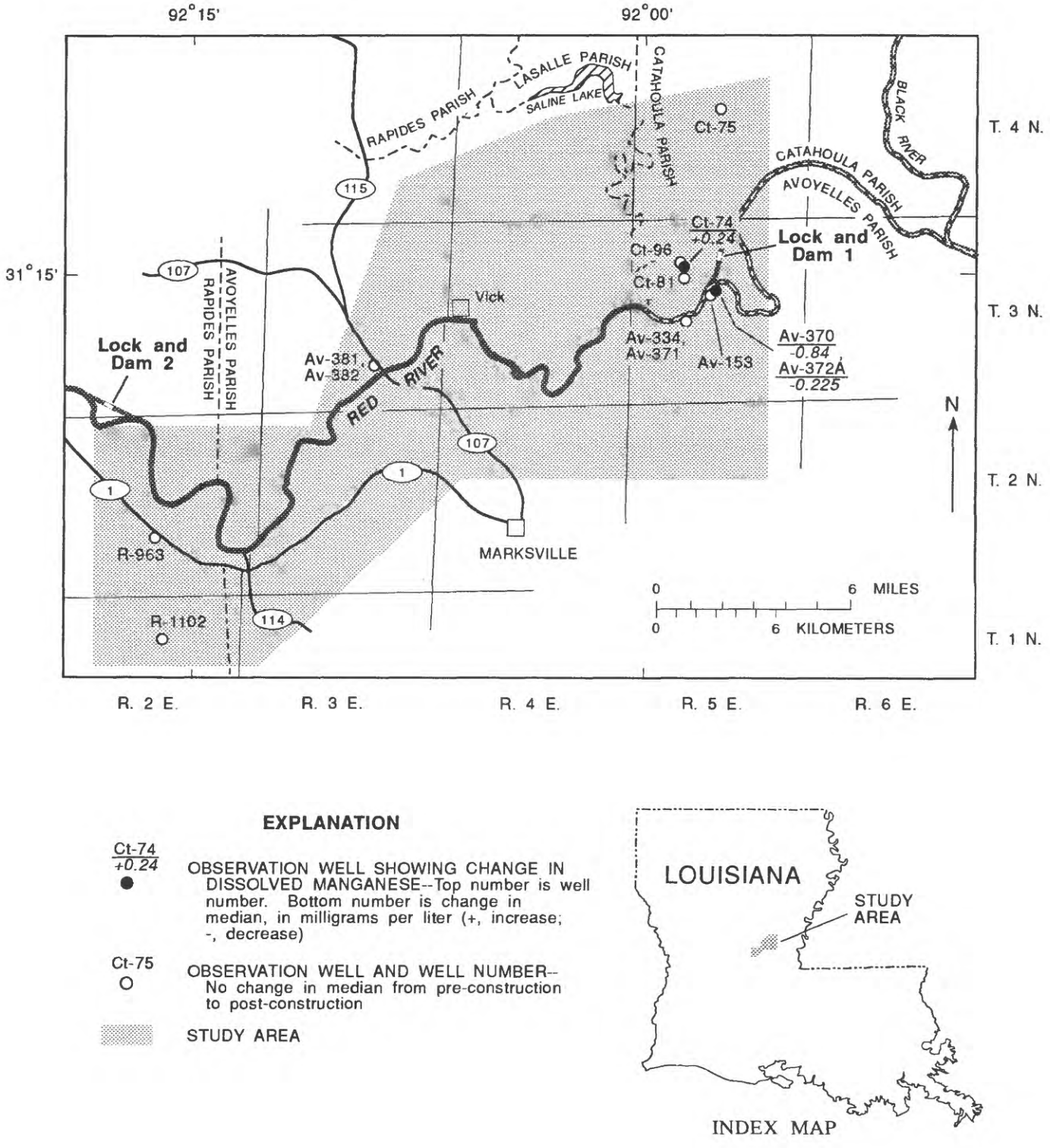
Excluding well Ct-74, data for three wells within approximately 1 mi south of Lock and Dam 1 indicated decreases, and data for one well about 3 mi south of Lock and Dam 1 indicated an increase in the concentration of dissolved iron between pre-construction and post-construction sampling periods. Data for one additional well about 10 mi west and about 2.5 mi south of Lock and Dam 1 indicated an increase in the concentration of dissolved iron between pre-construction and post-construction periods.

Dissolved Manganese

Median concentrations of dissolved manganese in water from well Ct-74 (fig. 12) indicated an increase and wells Av-370 (fig. 7), and Av-372A (fig. 9) indicated a decrease between pre-construction and post-construction sampling periods. Wells containing water that indicated a change in the median concentration of dissolved manganese between pre-construction and post-construction sampling periods are shown in figure 23.

Data for well Ct-74 indicated an increasing temporal trend in the concentration of dissolved manganese during pre-construction and post-construction sampling periods beginning in about 1975 and continuing at least into about 1988, followed by a usually constant concentration through 1992. The presence of a temporal trend in pre-construction and post-construction sampling periods indicates that hydrologic factors other than the construction of Lock and Dam 1 have affected the concentration of dissolved manganese in well Ct-74.

Only wells within approximately 1 mi of Lock and Dam 1 indicated changes in the concentration of dissolved manganese between pre-construction and post-construction sampling periods. Excluding well Ct-74, data for two wells to the south of Lock and Dam 1 indicated decreases in the concentration of dissolved manganese between pre-construction and post-construction sampling periods.



EXPLANATION

Ct-74 +0.24 ● OBSERVATION WELL SHOWING CHANGE IN DISSOLVED MANGANESE--Top number is well number. Bottom number is change in median, in milligrams per liter (+, increase; -, decrease)

Ct-75 ○ OBSERVATION WELL AND WELL NUMBER-- No change in median from pre-construction to post-construction

STUDY AREA

Figure 23. Changes in median concentration of dissolved manganese in water from wells completed in the Red River alluvial aquifer, from pre-construction (1974-78) to post-construction (1984-92) of Lock and Dam 1 on the Red River, Louisiana.

SUMMARY AND CONCLUSIONS

The quality of water in the Red River alluvial aquifer was monitored during pre-construction (1974-78), construction (1980-83), and post-construction (1984-92) of Lock and Dam 1, to document background conditions and establish a data base for future evaluation of the effects of construction and operation of the structures on the aquifer. Fifteen wells completed in the Red River alluvial aquifer within the study area have been sampled periodically from 1974 to 1990; five of these wells also were sampled in 1991 and 1992. Intermittent samples were collected from three other wells completed in the Red River alluvial aquifer in the study area. Total hardness as calcium carbonate and dissolved chloride, iron, and manganese concentrations, calculated from data collected during these sampling periods, were used to determine changes in quality of water in the aquifer, between pre-construction and post-construction of Lock and Dam 1.

Changes in median values and concentrations that were unaffected by temporal trends in total hardness and concentrations of dissolved chloride, iron, and manganese between the pre-construction and post-construction sampling periods were confined to within approximately 2 miles of Lock and Dam 1, except for increases in total hardness and dissolved iron concentration in well Av-381. Generally, total hardness and concentrations of dissolved chloride, iron, and manganese in the alluvial aquifer south of Lock and Dam 1 decreased between the pre-construction and post-construction sampling periods when changes, unaffected by temporal trends, occurred. Exceptions to this generalization were increases in the concentrations of dissolved chloride and iron in well Av-334 between the pre-construction and post-construction sampling periods. Change, unaffected by temporal trends, north of Lock and Dam 1 was limited to an increase in the concentration of dissolved chloride in well Ct-74 between the pre-construction and post-construction sampling periods. Because well Ct-74 is completed in a sand that is in contact with a saltwater sand of Tertiary age, this increase is probably a temporal increase due to upconing after lowering the water level in the alluvial aquifer by pumping of dewatering wells during construction of Lock and Dam 1.

The temporal trends during the pre-construction and post-construction sampling periods for total hardness and dissolved chloride and iron indicate that hydrologic factors other than the construction of Lock and Dam 1 have affected the quality of water in some of the wells completed in the Red River alluvial aquifer.

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TABLE 1

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92

[ft, feet; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; mg/L, milligrams per liter; +, water level above land surface; <, actual value is known to be less than value shown; dashes indicate no data]

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
AV-153	03-15-65	--	59	--	--	--	--	--	--	--	--	--	--
	03-23-74	--	59	1,490	6.3	--	--	840	--	--	--	--	--
	05-14-74	--	59	1,240	7.2	--	5	610	0	160	51	31	5.1
	08-23-74	7.29	59	1,500	6.4	--	--	980	--	--	--	--	--
	09-24-74	16.09	59	1,500	6.7	--	5	870	10	240	65	17	5.7
	10-21-74	19.62	59	1,440	6.9	--	--	790	--	--	--	--	--
	11-18-74	13.37	59	1,530	7.0	--	--	770	--	--	--	--	--
	12-16-74	9.26	59	1,460	6.3	20.5	--	850	--	--	--	--	--
	01-17-75	7.06	59	1,460	6.7	21.0	--	840	--	--	--	--	--
	02-11-75	5.16	59	1,470	6.6	--	--	800	--	--	--	--	--
	03-05-75	4.60	59	1,470	6.5	20.5	--	800	--	--	--	--	--
	04-26-75	+3.62	59	1,430	6.4	21.0	5	850	0	230	67	27	4.4
	06-03-75	3.70	59	1,490	6.7	--	0	750	--	200	60	28	4.4
	07-24-75	17.32	59	1,500	6.2	--	--	800	--	--	--	--	--
	03-22-76	14.52	59	--	6.9	--	--	830	--	--	--	--	--
	05-27-76	20.34	59	--	7.0	--	--	840	--	--	--	--	--
	12-09-76	28.99	59	--	--	--	--	780	--	--	--	--	--
	03-29-77	19.75	59	--	7.0	--	0	830	0	230	61	28	5.4
	03-27-78	20.74	59	--	6.7	--	--	750	--	--	--	--	--
	05-10-79	21.97	59	--	6.9	--	--	850	--	--	--	--	--
	04-16-80	31.89	59	--	--	--	--	640	--	--	--	--	--
	04-18-83	29.89	59	--	--	--	--	440	--	--	--	--	--
	03-21-84	18.80	59	--	6.8	--	--	610	--	150	56	--	--
	10-24-84	24.11	59	--	6.9	--	--	660	--	--	61	--	--
	03-14-85	11.74	59	--	6.8	--	--	630	--	160	57	--	--
	10-08-85	26.30	59	--	7.0	--	--	670	--	170	60	--	--
	04-01-86	18.57	59	--	6.8	--	--	700	--	170	68	--	--
	08-29-86	23.44	59	--	6.9	23.5	--	650	--	160	60	--	--
	03-26-87	8.26	59	1,300	6.9	20.0	--	770	--	200	68	--	--
	04-19-89	11.65	59	1,370	6.8	20.5	10	700	--	170	66	27	4.5
AV-331	04-21-70	--	42	2,100	6.3	--	1	790	690	250	41	160	1.1
	04-08-74	--	42	1,540	5.7	20.5	--	440	--	--	--	--	--
	07-22-75	--	42	1,430	--	20.0	0	530	380	120	55	120	.8
	10-22-76	--	42	--	6.5	--	--	860	--	--	--	--	--
	09-19-88	7.43	42	807	6.3	20.0	0	270	0	60	30	100	.9
	04-18-89	3.77	42	780	6.6	20.5	5	220	--	46	26	93	.8
	04-12-90	1.93	42	777	6.5	20.0	0	220	--	47	25	95	1.1
AV-334	10-18-72	--	90	1,010	--	--	--	440	--	110	39	--	--
	11-28-72	--	90	975	--	--	--	410	--	100	38	--	--
	12-19-72	--	90	1,000	--	--	--	400	--	100	37	--	--
	02-20-73	--	90	1,030	--	--	--	380	--	90	37	--	--
	06-19-73	--	90	1,100	7.2	20.0	--	390	--	96	37	--	--
	08-15-73	--	90	--	--	--	--	440	--	--	--	--	--
	12-03-73	--	90	989	--	20.5	--	410	--	--	--	--	--
	02-15-74	--	90	982	--	--	--	380	--	--	--	--	--
	03-23-74	5.45	90	1,010	6.5	--	--	440	--	--	--	--	--
	07-02-74	5.45	90	1,000	6.4	--	--	510	--	--	--	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	--	30	--	--	--	--	--	--	--	--	--	--	--
--	8.6	13	--	--	--	--	--	--	--	--	--	5.8	--
660	9.4	13	<0.1	38	740	720	--	1.2	--	--	--	17	1.8
--	16	15	--	--	--	--	--	--	--	--	--	7.9	--
850	8.0	12	1.0	36	--	913	--	.04	--	--	--	20	2.1
--	11	14	--	--	--	--	--	--	--	--	--	19	--
--	3.0	21	--	--	--	--	--	--	--	--	--	22	2.1
--	8.0	14	--	--	--	--	--	--	--	--	--	19	1.8
--	6.2	13	--	--	--	--	--	--	--	--	--	20	2.2
--	6.2	14	--	--	--	--	--	--	--	--	--	18	2.1
--	4.4	13	--	--	--	--	--	--	--	--	--	19	1.8
860	8.0	12	.4	41	--	929	0.59	--	1.9	0.01	0.6	18	2.2
800	5.8	13	.3	36	903	828	--	.0	--	--	--	--	1.7
--	39	13	--	--	--	--	--	--	--	--	--	18	1.8
--	3.6	12	--	--	--	--	--	--	--	--	--	26	1.9
--	8.0	14	--	--	--	--	--	--	--	--	--	18	1.9
--	10	14	--	--	--	--	--	--	--	--	--	--	1.3
890	6.8	10	.3	54	888	947	--	.28	--	--	--	18	2.0
--	3.8	9.4	--	--	--	--	--	--	--	--	--	18	1.9
--	22	15	--	--	--	--	--	--	--	--	--	20	3.0
--	16	13	--	--	--	--	--	--	--	--	--	--	1.5
--	10	18	--	--	--	--	--	--	--	--	--	--	--
--	18	14	--	--	--	--	--	--	--	--	--	14	1.2
--	13	13	--	--	--	--	--	--	--	--	--	13	1.3
--	9.8	14	--	--	--	--	--	--	--	--	--	14	1.4
--	16	18	--	--	--	--	--	--	--	--	--	15	1.5
--	10	12	--	--	--	--	--	--	--	--	--	17	1.6
--	11	11	--	--	--	--	--	--	--	--	--	16	1.5
750	9.0	11	--	--	--	--	--	--	--	--	--	16	2.0
786	11	13	.3	45	749	826	<.01	--	--	--	<.02	16	2.4
120	580	280	.2	37	1,560	1,420	--	--	--	--	--	.60	.20
--	430	140	--	--	--	--	--	--	--	--	--	.65	--
130	410	140	.3	42	1,020	967	--	.03	--	--	--	.69	.03
--	690	300	--	--	--	--	--	--	--	--	--	1.1	.09
293	120	7.5	.5	37	511	539	<.01	--	--	--	1.5	.23	.24
314	99	6.8	.3	37	495	511	<.01	--	--	--	3.0	.16	.02
290	100	5.8	.4	38	507	490	<.01	--	--	--	.73	.21	.03
--	--	44	--	--	--	--	--	--	--	--	--	--	--
--	--	46	--	--	--	--	--	--	--	--	--	--	--
--	--	43	--	--	--	--	--	--	--	--	--	--	--
--	--	44	--	--	--	--	--	--	--	--	--	--	--
--	--	36	--	--	--	--	--	--	--	--	--	--	--
--	--	34	--	--	--	--	--	--	--	--	--	--	--
--	8.4	84	--	--	--	--	--	--	--	--	--	16	--
--	13	46	--	--	--	--	--	--	--	--	--	--	--
--	4.4	47	--	--	--	--	--	--	--	--	--	14	--
--	.8	42	--	--	--	--	--	--	--	--	--	15	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
Av-334	08-23-74	22.19	90	1,020	6.9	--	--	510	--	--	--	--	--
	09-24-74	13.48	90	1,000	6.7	--	20	440	0	110	39	32	4.7
	10-23-74	18.52	90	1,000	6.8	--	--	--	--	--	--	--	--
	11-19-74	9.29	90	991	6.8	--	--	--	--	--	--	--	--
	12-16-74	6.83	90	975	6.4	--	--	420	--	--	--	--	--
	01-17-75	5.35	90	1,010	6.4	--	--	400	--	--	--	--	--
	02-11-75	3.14	90	972	6.8	--	--	390	--	--	--	--	--
	03-05-75	2.69	90	972	6.6	--	--	400	--	--	--	--	--
	04-05-75	+0.79	90	1,000	6.7	--	15	410	0	100	40	47	3.5
	05-24-75	+1.02	90	1,000	6.8	21.5	--	410	--	100	40	--	--
	06-18-75	.80	90	978	6.8	--	--	400	--	--	--	--	--
	07-24-75	14.95	90	1,010	--	--	--	380	--	--	--	--	--
	10-27-75	24.23	90	1,020	6.8	--	5	440	0	110	39	46	4.4
	03-22-76	11.45	90	--	6.8	--	--	400	--	--	--	--	--
	05-27-76	18.05	90	--	6.9	--	--	390	41	100	35	50	3.3
	08-16-76	23.82	90	--	6.9	--	20	430	0	100	43	45	4.1
	11-04-76	26.11	90	--	6.6	--	15	440	0	110	39	44	4.0
	03-29-77	14.12	90	--	6.9	--	--	410	--	--	--	--	--
	09-15-77	26.73	90	--	--	--	--	400	--	--	--	--	--
	03-27-78	18.45	90	--	6.6	--	5	400	0	96	40	46	4.2
	09-22-78	28.07	90	--	--	--	--	430	--	--	--	--	--
	03-26-79	15.63	90	--	6.9	--	--	400	--	--	--	--	--
	11-28-79	29.07	90	--	--	--	--	400	--	--	--	--	--
	04-11-80	17.95	90	--	6.7	--	--	400	--	--	--	--	--
	09-18-80	33.85	90	--	--	--	--	400	--	--	--	--	--
	04-27-81	34.90	90	--	--	--	--	400	--	--	--	--	--
	09-29-81	34.92	90	--	--	--	--	410	--	--	--	--	--
	04-20-82	26.60	90	--	--	--	--	410	--	--	--	--	--
	09-20-82	32.18	90	--	--	--	--	410	--	--	--	--	--
	03-21-84	12.83	90	--	6.8	--	--	400	--	99	38	--	--
	10-24-84	18.95	90	--	6.8	--	--	450	--	100	48	--	--
	03-14-85	8.12	90	--	6.9	--	--	430	--	110	38	--	--
	10-08-85	21.48	90	--	6.9	--	--	460	--	120	40	--	--
	04-01-86	13.88	90	--	6.8	22.0	--	470	--	110	47	--	--
	08-29-86	16.47	90	--	6.7	--	--	380	--	90	38	--	--
	03-26-87	5.47	90	1,100	6.8	21.0	--	460	--	110	45	--	--
	06-28-88	16.39	90	1,090	6.7	--	5	450	--	120	36	58	4.0
AV-339	04-22-70	--	42	910	6.7	--	1	300	120	68	31	77	1.1
	09-23-74	--	42	895	6.2	20.0	0	300	140	69	31	56	2.7
	03-07-75	--	42	904	6.3	20.5	--	300	--	--	--	--	--
	06-24-88	8.22	42	1,070	6.4	--	5	380	--	90	37	90	1.2
	04-18-89	5.20	42	1,110	6.3	20.5	0	390	220	89	40	90	1.2
	04-12-90	5.50	42	1,110	6.4	20.5	0	390	--	88	42	95	1.5
AV-364	02-05-76	22.72	42	1,590	6.9	--	5	880	0	220	80	29	3.3
	03-22-76	15.39	42	--	7.0	--	--	900	--	--	--	--	--
	05-27-76	17.44	42	--	7.1	--	--	920	0	250	71	38	2.2
	11-03-76	26.85	42	--	--	--	5	930	36	250	75	29	2.3
	03-29-77	19.07	42	--	7.0	--	--	930	--	--	--	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	2.0	38	--	--	--	--	--	--	--	--	--	15	--
450	2.2	41	0.1	38	555	554	--	--	--	--	--	17	0.48
--	2.8	44	--	--	--	--	--	--	--	--	--	16	.46
--	<1.0	43	--	--	--	--	--	--	--	--	--	15	.50
--	1.2	46	--	--	--	--	--	--	--	--	--	16	.44
--	<1.0	47	--	--	--	--	--	--	--	--	--	16	.46
--	.4	49	--	--	--	--	--	--	--	--	--	15	.48
--	<1.0	50	--	--	--	--	--	--	--	--	--	15	.42
470	<1.0	49	.2	48	558	581	0.04	--	0.13	0.0	0.04	16	.46
--	.9	48	--	--	--	--	--	--	--	--	--	16	.45
--	.2	46	--	--	--	--	--	--	--	--	--	14	.47
--	1.4	46	--	--	--	--	--	--	--	--	--	15	.43
480	.8	37	.1	38	568	580	--	--	--	--	--	14	.48
--	.2	98	--	--	--	--	--	--	--	--	--	11	--
350	3.6	100	.3	29	587	550	--	--	--	--	--	16	--
490	.2	43	.2	41	561	585	--	--	--	--	--	14	.47
460	.2	36	.3	41	584	565	--	--	--	--	--	14	.47
--	1.0	42	--	--	--	--	--	--	--	--	--	16	.44
--	.8	43	--	--	--	--	--	--	--	--	--	--	.47
410	2.6	45	.1	45	586	541	--	--	--	--	--	15	.46
--	.4	40	--	--	--	--	--	--	--	--	--	--	.48
--	<.2	54	--	--	--	--	--	--	--	--	--	16	.49
--	.6	51	--	--	--	--	--	--	--	--	--	--	.43
--	.2	58	--	--	--	--	--	--	--	--	--	16	.50
--	.4	52	--	--	--	--	--	--	--	--	--	--	.38
--	2.0	62	--	--	--	--	--	--	--	--	--	--	.46
--	.6	64	--	--	--	--	--	--	--	--	--	--	.44
--	1.2	71	--	--	--	--	--	--	--	--	--	--	.50
--	.4	64	--	--	--	--	--	--	--	--	--	--	.53
--	.4	97	--	--	--	--	--	--	--	--	--	21	.48
--	.2	76	--	--	--	--	--	--	--	--	--	21	.48
--	.6	84	--	--	--	--	--	--	--	--	--	19	.52
--	.6	76	--	--	--	--	--	--	--	--	--	19	.56
--	.6	82	--	--	--	--	--	--	--	--	--	20	.54
--	.4	76	--	--	--	--	--	--	--	--	--	20	.68
500	.4	83	--	--	--	--	--	--	--	--	--	19	.60
498	34	72	.1	44	403	690	<.01	--	--	--	<.02	23	.56
170	200	65	.2	41	617	589	--	--	--	--	--	.10	1.6
160	190	61	.4	47	592	555	--	--	--	--	--	.55	2.1
--	190	66	--	--	--	--	--	--	--	--	--	.85	2.6
180	240	96	<.2	47	754	712	<.01	--	--	--	<.02	.56	2.1
169	250	110	.2	54	755	738	<.01	--	--	--	<.02	.30	2.2
175	250	120	.2	56	761	1,660	<.01	--	--	--	<.02	.40	2.0
950	.2	14	.4	36	982	973	--	--	--	--	--	12	8.0
--	<1.0	34	--	--	--	--	--	--	--	--	--	14	10
930	--	14	.5	29	969	985	--	--	--	--	--	12	8.5
910	1.4	20	.3	32	--	956	--	--	--	--	--	--	--
--	<1.0	15	--	--	--	--	--	--	--	--	--	18	11

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
AV-364	09-15-77	26.94	42	--	--	--	--	910	--	--	--	--	--
	03-27-78	20.34	42	--	6.6	--	--	920	--	--	--	--	--
	05-10-79	18.64	42	--	6.9	--	--	940	--	--	--	--	--
	10-13-87	21.90	42	--	6.9	--	0	1,100	--	300	80	35	2.0
AV-370	05-14-74	7.58	105	1,240	7.0	--	5	600	27	140	60	38	3.9
	08-23-74	24.05	105	1,380	6.2	--	--	880	--	--	--	--	--
	09-24-74	16.35	105	1,360	6.8	21.0	5	760	66	190	69	18	4.5
	10-21-74	20.10	105	1,380	6.7	20.5	--	740	--	--	--	--	--
	11-18-74	17.43	105	1,400	7.0	21.0	--	730	--	--	--	--	--
	12-16-74	9.49	105	1,430	6.5	20.0	--	810	--	--	--	--	--
	01-17-75	7.42	105	1,430	6.9	20.5	--	820	--	--	--	--	--
	02-11-75	5.34	105	1,410	6.5	20.0	--	760	--	--	--	--	--
	03-05-75	4.88	105	1,420	--	20.0	--	740	--	--	--	--	--
	04-26-75	1.50	105	1,480	6.4	20.5	5	840	53	200	83	34	3.6
	06-03-75	3.31	105	1,470	6.4	21.0	5	730	0	200	56	45	3.8
	07-23-75	17.28	105	1,450	6.6	21.0	--	740	--	--	--	--	--
	03-22-76	14.46	105	1,160	6.9	20.5	--	640	--	--	--	--	--
	05-27-76	20.71	105	--	7.3	--	--	630	--	--	--	--	--
	11-03-76	29.06	105	--	--	--	15	680	22	170	62	32	3.5
	03-29-77	19.82	105	--	6.9	--	0	670	0	160	65	32	4.0
	09-15-77	29.51	105	--	--	--	--	660	--	--	--	--	--
	03-27-78	20.82	105	--	6.8	--	--	620	--	--	--	--	--
	09-22-78	--	105	--	--	--	--	670	--	--	--	--	--
	05-10-79	21.54	105	--	6.9	--	--	680	--	--	--	--	--
	11-29-79	41.01	105	--	--	--	--	470	--	--	--	--	--
	04-16-80	31.24	105	--	--	--	--	420	--	--	--	--	--
	09-18-80	45.64	105	--	--	--	--	380	--	--	--	--	--
	04-27-81	46.86	105	--	--	--	--	360	--	--	--	--	--
	09-29-81	46.81	105	--	--	--	--	340	--	--	--	--	--
	04-20-82	38.55	105	--	--	--	--	330	--	--	--	--	--
	09-20-82	41.05	105	--	--	--	--	300	--	--	--	--	--
	04-18-83	29.79	105	--	--	--	--	290	--	72	26	--	--
	09-23-83	40.98	105	--	--	--	--	320	--	77	30	--	--
	03-21-84	18.27	105	--	6.8	20.0	--	300	--	74	28	--	--
	10-24-84	24.30	105	--	7.0	24.0	--	330	--	73	35	--	--
	03-14-85	11.81	105	--	6.9	--	--	330	--	81	30	--	--
	10-08-85	26.16	105	--	7.1	22.0	--	350	--	85	34	--	--
	04-01-86	18.92	105	--	7.0	21.0	--	370	--	90	35	--	--
	08-29-86	23.55	105	--	6.8	21.0	--	310	--	73	30	--	--
	03-26-87	7.37	105	690	7.1	20.0	--	320	--	80	30	--	--
	10-13-87	24.80	105	--	7.2	--	0	300	--	72	30	20	4.0
	04-19-89	11.74	105	665	7.0	20.5	10	330	--	77	33	22	3.1
	03-26-91	14.02	105	687	6.9	20.5	5	310	--	72	31	22	3.6
	04-28-92	15.73	105	1,220	6.8	20.0	--	640	--	170	52	24	4.1

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	8.4	27	--	--	--	--	--	--	--	--	--	--	--
--	<.2	22	--	--	--	--	--	--	--	--	--	16	12
--	<.2	30	--	--	--	--	--	--	--	--	--	15	11
975	1.2	79	0.1	26	896	1,160	--	--	--	--	--	--	11
560	79	20	.1	42	750	737	--	--	--	--	--	18	1.4
--	71	16	--	--	--	--	--	--	--	--	--	16	--
690	44	16	.1	37	810	814	--	--	--	--	--	18	1.7
--	73	18	--	--	--	--	--	--	--	--	--	18	1.3
--	48	20	--	--	--	--	--	--	--	--	--	18	1.5
--	78	18	--	--	--	--	--	--	--	--	--	18	1.5
--	73	17	--	--	--	--	--	--	--	--	--	19	1.8
--	78	18	--	--	--	--	--	--	--	--	--	18	1.5
--	72	18	--	--	--	--	--	--	--	--	--	20	1.5
790	78	17	.3	46	919	953	<0.01	--	0.0	--	0.01	17	1.6
730	75	21	.2	43	923	885	--	--	--	--	--	--	1.4
--	91	18	--	--	--	--	--	--	--	--	--	18	1.4
--	28	21	--	--	--	--	--	--	--	--	--	15	1.3
--	24	21	--	--	--	--	--	--	--	--	--	15	1.2
660	64	18	.3	31	619	778	--	--	--	--	--	--	--
680	53	16	.2	60	758	815	--	--	--	--	--	15	1.4
--	51	15	--	--	--	--	--	--	--	--	--	--	--
--	46	14	--	--	--	--	--	--	--	--	--	14	1.4
--	22	15	--	--	--	--	--	--	--	--	--	--	--
--	34	24	--	--	--	--	--	--	--	--	--	12	1.6
--	--	26	--	--	--	--	--	--	--	--	--	--	.68
--	4.4	22	--	--	--	--	--	--	--	--	--	--	--
--	7.8	13	--	--	--	--	--	--	--	--	--	--	.70
--	--	9.9	--	--	--	--	--	--	--	--	--	--	--
--	--	9.4	--	--	--	--	--	--	--	--	--	--	--
--	2.4	9.3	--	--	--	--	--	--	--	--	--	--	--
--	11	3.3	--	--	--	--	--	--	--	--	--	--	--
--	8.8	1.0	--	--	--	--	--	--	--	--	--	--	--
--	4.7	29	--	--	--	--	--	--	--	--	--	--	.42
--	13	4.8	--	--	--	--	--	--	--	--	--	6.80	.43
--	12	2.8	--	--	--	--	--	--	--	--	--	6.90	.60
--	12	2.2	--	--	--	--	--	--	--	--	--	6.70	.48
--	--	10	--	--	--	--	--	--	--	--	--	8.0	.38
--	2.2	9.3	--	--	--	--	--	--	--	--	--	7.50	.52
--	.80	4.0	--	--	--	--	--	--	--	--	--	7.50	.56
360	.60	3.0	--	--	--	--	--	--	--	--	--	6.80	.42
364	.80	4.3	.2	51	385	408	--	--	--	--	--	7.00	.76
367	.20	10	.2	50	406	422	<.01	--	--	--	<.02	5.70	.81
385	<.20	9.6	.3	51	409	--	<.01	--	--	--	.02	6.70	.66
694	13	13	.3	46	706	755	<.01	--	--	--	.02	14	2.0

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
AV-371	09-24-74	13.41	136	979	6.7	--	5	400	57	94	41	33	3.7
	10-23-74	18.57	136	976	7.0	--	--	400	--	--	--	--	--
	11-19-74	9.11	136	915	7.1	--	--	380	--	--	--	--	--
	12-16-74	6.78	136	842	6.7	--	--	340	--	--	--	--	--
	01-17-75	5.33	136	875	7.2	--	--	360	--	--	--	--	--
	02-11-75	1.95	136	874	6.7	--	--	340	--	--	--	--	--
	03-05-75	2.65	136	824	7.2	--	--	320	--	--	--	--	--
	04-05-75	.87	136	817	7.1	--	7	320	0	81	28	42	--
	05-24-75	+1.07	136	807	7.1	--	--	320	--	80	28	--	--
	06-18-75	+0.77	136	780	7.1	--	--	300	--	--	--	--	--
	10-27-75	24.23	136	882	7.1	--	0	340	7	90	29	46	3.5
	03-22-76	11.47	136	--	7.0	--	--	420	--	--	--	--	--
	05-27-76	17.92	136	--	6.9	--	--	420	0	100	41	59	4.0
	08-16-76	23.90	136	--	7.0	--	10	440	42	110	39	55	3.5
	11-04-76	26.14	136	--	--	--	20	410	45	110	33	51	2.9
	01-20-77	22.37	136	--	6.9	--	--	420	--	--	--	--	--
	03-29-77	16.79	136	--	6.9	--	--	420	--	--	--	--	--
	09-15-77	26.72	136	--	--	--	--	410	--	--	--	--	--
	03-27-78	18.45	136	--	6.8	--	5	440	51	110	39	57	3.6
	09-22-78	28.07	136	--	--	--	--	420	--	--	--	--	--
	03-26-79	15.69	136	--	6.9	--	--	370	--	--	--	--	--
	11-29-79	29.04	136	--	--	--	--	350	--	--	--	--	--
	04-11-80	17.95	136	--	6.9	--	--	340	--	--	--	--	--
	09-18-80	33.85	136	--	--	--	--	320	--	--	--	--	--
	04-27-81	34.90	136	--	--	--	--	300	--	--	--	--	--
	09-29-81	34.95	136	--	--	--	--	300	--	--	--	--	--
	04-20-82	26.63	136	--	--	--	--	270	--	--	--	--	--
	09-20-82	32.22	136	--	--	--	--	290	--	--	--	--	--
	03-21-84	12.75	136	--	6.9	--	--	280	--	71	25	--	--
	10-24-84	18.97	136	--	7.0	--	--	300	--	68	31	--	--
	03-14-85	8.07	136	--	7.1	--	--	320	--	82	27	--	--
	10-08-85	21.53	136	--	7.0	--	--	300	--	67	31	--	--
	04-01-86	13.92	136	--	6.9	--	--	320	--	80	29	--	--
	08-29-86	16.45	136	--	6.8	--	--	280	--	71	26	--	--
	03-26-87	5.45	136	822	7.0	--	--	300	--	75	27	--	--
AV-372A	05-14-74	7.87	173	1,390	6.8	--	5	720	0	210	47	36	8.3
	08-23-74	24.36	173	1,410	6.4	--	--	860	--	--	--	--	--
	09-24-74	16.68	173	1,410	7.0	21.0	5	740	2	190	64	27	5.2
	10-21-74	20.43	173	1,400	6.6	20.5	--	730	--	--	--	--	--
	11-18-74	13.45	173	1,390	6.8	20.5	--	740	--	--	--	--	--
	12-16-74	9.84	173	1,400	6.4	20.5	--	750	--	--	--	--	--
	01-17-75	6.77	173	1,410	6.8	20.5	--	740	--	--	--	--	--
	02-11-75	5.73	173	1,400	6.7	20.0	--	720	--	--	--	--	--
	03-05-75	5.20	173	1,400	6.9	20.0	--	720	--	--	--	--	--
	04-26-75	1.93	173	1,430	6.2	20.5	5	750	0	190	66	42	--
	06-03-75	.80	173	1,440	6.6	20.5	5	670	--	200	42	40	6.8
	07-23-75	12.65	173	1,460	6.7	21.0	--	690	--	--	--	--	--
	03-22-76	14.37	173	--	7.0	--	--	760	--	--	--	--	--
	05-27-76	20.65	173	--	7.1	--	--	800	--	--	--	--	--
	11-04-76	28.98	173	--	--	--	5	740	0	190	64	41	7.5

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
340	3.6	100	0.2	28	562	528	--	--	--	--	--	17	1.4
--	3.6	88	--	--	--	--	--	--	--	--	--	17	1.5
--	15	44	--	--	--	--	--	--	--	--	--	13	1.4
--	2.6	66	--	--	--	--	--	--	--	--	--	16	.96
--	1.0	71	--	--	--	--	--	--	--	--	--	17	1.4
--	.8	76	--	--	--	--	--	--	--	--	--	16	.80
--	<1.0	73	--	--	--	--	--	--	--	--	--	16	1.5
340	<1.0	61	.2	33	458	466	<0.01	--	0.0	--	0.16	16	1.0
--	.1	58	--	--	--	--	--	--	--	--	--	16	.94
--	<1.0	54	--	--	--	--	--	--	--	--	--	15	.92
340	.8	75	.2	18	495	480	--	--	--	--	--	14	1.0
--	<1.0	40	--	--	--	--	--	--	--	--	--	15	.48
480	1.2	41	.3	44	567	593	--	--	--	--	--	15	.44
390	<1.0	120	.2	32	603	596	--	--	--	--	--	--	1.3
360	.2	110	.3	37	581	560	--	--	--	--	--	--	--
--	1.8	110	--	--	--	--	--	--	--	--	--	17	1.2
--	1.2	100	--	--	--	--	--	--	--	--	--	17	1.3
--	2.8	110	--	--	--	--	--	--	--	--	--	--	--
370	8.8	110	.2	32	640	602	--	--	--	--	--	17	1.1
--	.2	110	--	--	--	--	--	--	--	--	--	--	--
--	<.2	97	--	--	--	--	--	--	--	--	--	17	1.1
--	4.8	79	--	--	--	--	--	--	--	--	--	--	--
--	2.4	50	--	--	--	--	--	--	--	--	--	14	.86
--	2.4	64	--	--	--	--	--	--	--	--	--	--	--
--	.4	46	--	--	--	--	--	--	--	--	--	--	--
--	.4	51	--	--	--	--	--	--	--	--	--	--	--
--	.2	40	--	--	--	--	--	--	--	--	--	--	--
--	.2	48	--	--	--	--	--	--	--	--	--	--	--
--	9.4	43	--	--	--	--	--	--	--	--	--	11	.59
--	.8	43	--	--	--	--	--	--	--	--	--	--	--
--	.4	48	--	--	--	--	--	--	--	--	--	15	.87
--	1.0	46	--	--	--	--	--	--	--	--	--	13	.88
--	.4	48	--	--	--	--	--	--	--	--	--	15	.68
--	.4	46	--	--	--	--	--	--	--	--	--	16	.76
370	.6	47	--	--	--	--	--	--	--	--	--	16	1.0
730	5.2	41	.3	39	846	830	--	--	--	--	--	7.8	.59
--	3.2	24	--	--	--	--	--	--	--	--	--	8.2	--
740	4.8	44	.2	38	--	832	--	--	--	--	--	13	.62
--	1.4	45	--	--	--	--	--	--	--	--	--	13	.66
--	3.4	45	--	--	--	--	--	--	--	--	--	8.9	.67
--	<1.0	44	--	--	--	--	--	--	--	--	--	13	.67
--	.6	45	--	--	--	--	--	--	--	--	--	14	.60
--	1.0	46	--	--	--	--	--	--	--	--	--	13	.65
--	<1.0	46	--	--	--	--	--	--	--	--	--	14	.60
770	2.0	44	.3	45	874	869	.06	0.10	.20	0.02	.08	14	--
740	<1.0	45	.3	38	873	817	--	--	--	--	--	--	.60
--	.6	43	--	--	--	--	--	--	--	--	--	12	.55
--	4.0	42	--	--	--	--	--	--	--	--	--	13	.68
--	.6	45	--	--	--	--	--	--	--	--	--	13	.72
840	10	42	.3	47	--	903	--	--	--	--	--	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
AV-372A	04-28-77	12.37	173	--	6.9	20.0	30	700	0	180	62	39	7.3
	09-15-77	29.51	173	--	--	--	--	710	--	--	--	--	--
	03-27-78	20.84	173	--	6.7	20.0	--	680	--	--	--	--	--
	09-22-78	30.82	173	1,420	--	--	--	720	--	--	--	--	--
	05-10-79	21.37	173	--	7.0	20.5	--	700	--	--	--	--	--
	11-29-79	40.82	173	1,150	--	--	--	570	--	--	--	--	--
	04-11-80	32.05	173	--	--	--	--	540	--	--	--	--	--
	04-27-81	46.67	173	--	--	--	--	400	--	--	--	--	--
	09-29-81	46.54	173	--	--	--	--	420	--	--	--	--	--
	04-20-82	38.37	173	--	--	--	--	430	--	--	--	--	--
	09-20-82	40.95	173	--	--	--	--	430	--	--	--	--	--
	04-18-83	29.66	173	--	--	--	--	410	--	100	39	--	--
	09-23-83	40.77	173	--	--	--	--	430	--	110	37	--	--
	03-21-84	18.07	173	--	7.0	20.5	--	390	--	100	35	--	--
	10-24-84	24.33	173	--	6.9	22.0	--	380	--	96	35	--	--
	03-14-85	11.85	173	--	6.9	--	--	400	--	99	36	--	--
	10-08-85	26.73	173	--	7.1	22.0	--	430	--	110	37	--	--
	04-01-86	18.99	173	--	6.9	20.0	--	410	--	100	40	--	--
	08-29-86	23.80	173	--	6.9	20.5	--	380	--	96	33	--	--
	03-26-87	8.43	173	800	7.0	20.0	--	360	--	90	33	--	--
	10-13-87	24.90	173	--	7.0	--	0	390	--	100	33	38	4.8
	04-19-89	11.88	173	732	7.0	20.5	10	320	0	79	29	27	4.3
	03-26-91	14.12	173	658	7.0	21.0	5	260	--	67	23	27	3.9
	04-26-92	17.12	173	645	6.9	21.5	--	250	--	63	22	29	4.1
AV-381	01-13-76	21.13	150	--	6.9	--	5	220	0	67	14	100	2.8
	04-08-76	14.95	150	--	7.3	20.0	--	220	--	--	--	--	--
	07-09-76	17.90	150	--	6.9	--	--	210	--	--	--	--	--
	12-09-76	24.18	150	--	7.2	20.0	--	190	--	--	--	--	--
	03-29-77	18.46	150	--	7.2	20.0	0	200	0	55	15	120	3.1
	09-16-77	24.45	150	--	7.2	20.0	5	190	0	52	14	110	2.7
	03-28-78	20.96	150	--	6.7	20.5	--	190	--	--	--	--	--
	09-22-78	26.80	150	--	--	--	--	200	--	--	--	--	--
	03-26-79	11.90	150	--	7.2	20.0	--	190	--	--	--	--	--
	11-27-79	21.66	150	--	--	20.0	--	210	--	--	--	--	--
	04-10-80	14.02	150	--	7.0	20.5	--	200	--	--	--	--	--
	09-18-80	25.05	150	--	6.9	20.5	--	200	--	--	--	--	--
	04-27-81	26.75	150	--	7.1	20.5	--	200	--	--	--	--	--
	09-28-81	26.24	150	--	7.0	20.5	--	200	--	--	--	--	--
	04-19-82	22.28	150	--	7.1	20.5	--	210	--	--	--	--	--
	09-22-82	25.88	150	--	7.0	20.5	--	210	--	--	--	--	--
	04-20-83	15.90	150	--	7.1	20.5	--	220	--	55	19	--	--
	09-23-83	25.45	150	--	7.0	20.5	--	250	--	65	21	--	--
	03-20-84	13.59	150	--	7.0	20.5	--	320	--	84	27	--	--
	10-23-84	20.88	150	--	7.2	21.0	--	210	--	54	19	--	--
	03-25-85	10.95	150	--	6.8	21.5	--	230	--	59	20	--	--
	10-11-85	23.67	150	--	7.1	20.5	--	260	--	65	23	--	--
	04-02-86	17.64	150	--	7.0	20.5	--	280	--	76	23	--	--
	08-28-86	18.39	150	--	7.0	20.5	--	230	--	60	19	--	--
	06-15-87	13.66	150	--	7.1	20.0	--	240	--	63	21	--	--
	06-24-88	18.01	150	960	6.8	20.5	5	320	--	85	25	120	2.6
	04-16-90	4.92	150	938	7.2	20.0	0	330	--	83	29	100	2.9

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
770	6.8	42	0.1	35	861	846	--	0.0	--	--	--	13	0.60
--	12	40	--	--	--	--	--	--	--	--	--	--	--
--	6.8	40	--	--	--	--	--	--	--	--	--	12	.61
--	.4	41	--	--	--	--	--	--	--	--	--	--	--
--	.6	60	--	--	--	--	--	--	--	--	--	12	.73
--	31	38	--	--	--	--	--	--	--	--	--	--	--
--	17	34	--	--	--	--	--	--	--	--	--	--	--
--	14	28	--	--	--	--	--	--	--	--	--	--	--
--	14	30	--	--	--	--	--	--	--	--	--	--	--
--	14	37	--	--	--	--	--	--	--	--	--	--	--
--	35	36	--	--	--	--	--	--	--	--	--	--	--
--	8.2	34	--	--	--	--	--	--	--	--	--	--	--
--	6.0	32	--	--	--	--	--	--	--	--	--	--	.34
--	1.2	30	--	--	--	--	--	--	--	--	--	7.7	.34
--	2.6	29	--	--	--	--	--	--	--	--	--	7.6	.40
--	4.0	28	--	--	--	--	--	--	--	--	--	7.8	.39
--	2.6	48	--	--	--	--	--	--	--	--	--	7.1	.44
--	1.2	30	--	--	--	--	--	--	--	--	--	7.8	.40
--	.6	27	--	--	--	--	--	--	--	--	--	7.5	.33
410	.6	22	--	--	--	--	--	--	--	--	--	6.4	.52
400	5.0	21	.1	46	450	494	--	--	--	--	1.2	6.0	.68
321	14	34	.2	45	382	432	<0.01	--	--	--	.48	4.8	.37
232	20	60	.3	44	417	389	<.01	--	--	--	.02	4.5	.25
186	39	68	.3	44	396	485	<.10	--	--	--	.02	4.3	.23
360	7.8	55	.5	32	508	497	--	--	--	--	--	2.3	.18
--	28	55	--	--	--	--	--	--	--	--	--	2.3	.14
--	7.8	57	--	--	--	--	--	--	--	--	--	2.2	.14
--	4.4	70	--	--	--	--	--	--	--	--	--	1.9	.08
370	8.2	62	.6	41	502	528	--	--	--	--	--	2.3	.12
340	6.6	64	.6	32	485	491	--	--	--	--	--	2.1	.12
--	6.6	63	--	--	--	--	--	--	--	--	--	2.1	.14
--	4.4	66	--	--	--	--	--	--	--	--	--	--	--
--	6.6	65	--	--	--	--	--	--	--	--	--	2.3	.14
--	7.4	64	--	--	--	--	--	--	--	--	--	2.2	.13
--	6.8	64	--	--	--	--	--	--	--	--	--	2.2	.12
--	9.0	62	--	--	--	--	--	--	--	--	--	2.1	.13
--	6.4	63	--	--	--	--	--	--	--	--	--	2.4	.15
--	6.0	64	--	--	--	--	--	--	--	--	--	2.3	.13
--	4.2	66	--	--	--	--	--	--	--	--	--	2.6	.17
--	7.4	66	--	--	--	--	--	--	--	--	--	2.3	.20
--	7.0	61	--	--	--	--	--	--	--	--	--	2.5	.17
--	9.8	56	--	--	--	--	--	--	--	--	--	2.7	.14
--	13	49	--	--	--	--	--	--	--	--	--	4.9	.19
--	6.2	63	--	--	--	--	--	--	--	--	--	2.6	.16
--	7.2	60	--	--	--	--	--	--	--	--	--	2.1	.13
--	12	56	--	--	--	--	--	--	--	--	--	2.6	.15
--	7.6	62	--	--	--	--	--	--	--	--	--	2.7	.24
--	8.2	57	--	--	--	--	--	--	--	--	--	2.7	.13
398	6.6	58	--	--	--	--	--	--	--	--	--	2.6	.15
466	14	46	.4	34	553	610	<.01	--	--	--	<.02	3.5	.23
455	11	61	.6	35	560	599	<.01	--	--	--	<.02	3.6	.18

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
AV-382	01-13-76	20.75	37	--	6.7	--	0	500	1	130	42	6.5	0.3
	04-08-76	15.70	37	--	7.0	--	--	450	--	--	--	--	--
	07-09-76	17.51	37	--	6.8	--	--	450	--	--	--	--	--
	12-09-76	24.20	37	--	--	--	--	490	--	--	--	--	--
	03-29-77	17.68	37	--	6.8	--	0	400	0	100	37	4.7	.3
	03-28-78	20.67	37	--	6.7	20.5	--	350	--	--	--	--	--
	03-26-79	12.50	37	--	--	20.0	--	310	--	--	--	--	--
	11-27-79	21.51	37	--	--	--	--	340	--	--	--	--	--
	05-14-80	15.92	37	--	--	--	--	350	--	--	--	--	--
	04-20-83	14.93	37	--	7.1	20.0	--	330	--	--	--	--	--
	03-20-84	13.05	37	--	7.0	20.0	--	320	--	80	28	--	--
	10-23-84	20.41	37	--	--	--	--	330	--	76	35	--	--
	03-25-85	10.47	37	--	6.3	21.0	--	300	--	80	25	--	--
	10-11-85	23.04	37	--	7.0	21.0	--	320	--	77	30	--	--
	04-02-86	17.17	37	--	6.8	19.5	--	300	--	76	26	--	--
	08-28-86	18.08	37	--	6.8	20.5	--	350	--	86	32	--	--
	06-15-87	13.24	37	--	6.8	20.0	--	320	--	80	30	--	--
	06-24-88	17.43	37	570	6.6	20.5	5	330	--	90	25	5.0	.3
	04-16-90	4.83	37	588	6.9	20.0	0	350	--	86	33	5.0	1.0
CT-74	04-27-74	--	196	--	--	--	--	92	--	--	--	--	--
	09-19-74	13.30	196	939	7.2	20.0	5	89	0	23	7.7	190	5.3
	10-25-74	16.30	196	948	6.7	20.0	--	89	--	--	--	--	--
	11-29-74	7.40	196	930	7.2	20.0	--	95	--	--	--	--	--
	12-19-74	5.61	196	886	7.0	20.0	--	98	--	--	--	--	--
	01-28-75	4.90	196	954	7.2	20.0	--	96	--	--	--	--	--
	04-05-75	+1.76	196	960	7.1	20.0	10	94	0	25	7.7	200	3.5
	07-21-75	9.77	196	961	7.1	20.0	0	93	0	23	8.6	190	3.2
	10-29-75	20.62	196	929	7.3	20.0	0	91	0	22	8.7	190	4.8
	03-23-76	10.20	196	927	7.2	20.0	--	100	--	--	--	--	--
	05-28-76	15.15	196	921	7.3	20.0	--	100	--	--	--	--	--
	06-28-76	16.70	196	925	7.2	20.0	--	110	--	--	--	--	--
	10-22-76	23.70	196	963	7.1	--	0	100	0	29	7.9	190	3.8
	03-30-77	14.60	196	938	7.2	20.0	10	110	0	39	2.6	180	4.6
	09-16-77	23.45	196	931	7.2	20.0	--	110	--	--	--	--	--
	03-28-78	16.43	196	908	6.9	20.0	--	120	--	--	--	--	--
	09-25-78	25.25	196	1,070	--	--	--	150	--	--	--	--	--
	05-14-79	34.60	196	870	--	--	--	210	--	--	--	--	--
	11-28-79	46.05	196	931	--	--	--	190	--	--	--	--	--
	04-10-80	39.70	196	--	--	--	--	190	--	--	--	--	--
	04-28-81	53.40	196	--	--	--	--	130	--	--	--	--	--
	09-28-81	54.00	196	--	--	--	--	120	--	--	--	--	--
	04-20-82	45.04	196	--	--	--	--	170	--	--	--	--	--
	09-21-82	45.12	196	--	--	--	--	170	--	--	--	--	--
	04-19-83	37.16	196	--	--	--	--	230	--	60	19	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
490	10	3.6	1.0	25	499	510	--	--	--	--	--	0.14	0.38
--	15	3.8	--	--	--	--	--	--	--	--	--	.33	.16
--	10	3.0	--	--	--	--	--	--	--	--	--	.12	.14
--	9.6	4.2	--	--	--	--	--	--	--	--	--	--	.26
400	11	1.8	.3	29	404	426	--	--	--	--	--	.17	.25
--	9.4	2.0	--	--	--	--	--	--	--	--	--	.09	.35
--	8.8	1.8	--	--	--	--	--	--	--	--	--	.24	.30
--	10	1.0	--	--	--	--	--	--	--	--	--	--	--
--	8.6	1.2	--	--	--	--	--	--	--	--	--	.13	.37
--	8.4	1.8	--	--	--	--	--	--	--	--	--	.22	.18
--	8.5	4.4	--	--	--	--	--	--	--	--	--	.85	.14
--	6.6	4.0	--	--	--	--	--	--	--	--	--	.92	.24
--	10	4.5	--	--	--	--	--	--	--	--	--	1.2	.24
--	9.4	7.0	--	--	--	--	--	--	--	--	--	2.4	.16
--	6.0	4.2	--	--	--	--	--	--	--	--	--	2.3	.34
--	8.2	3.6	--	--	--	--	--	--	--	--	--	1.0	.18
308	7.6	4.7	--	--	--	--	--	--	--	--	--	3.0	.30
318	12	5.5	.2	28	201	361	--	--	--	<0.01	0.41	2.7	.26
325	12	5.5	.4	27	349	369	0.02	--	0.07	.66	.68	1.2	.26
--	--	48	--	--	--	--	--	--	--	--	--	--	--
440	2.2	45	.5	32	578	571	--	0.35	--	--	--	.19	.09
--	2.2	46	--	--	--	--	--	--	--	--	--	.25	.08
--	4.0	46	--	--	--	--	--	--	--	--	--	.28	.10
--	.6	47	--	--	--	--	--	--	--	--	--	.31	.10
--	.8	45	--	--	--	--	--	--	--	--	--	.41	.14
450	.3	47	.6	34	597	596	.01	--	.03	1.69	1.7	.30	.10
440	<1.0	48	.5	33	597	568	--	.05	--	--	--	.31	.09
450	.8	44	.4	31	578	572	--	.27	--	--	--	.33	.12
--	6.2	45	--	--	--	--	--	--	--	--	--	.43	.13
--	.6	44	--	--	--	--	--	--	--	--	--	.42	.12
--	.2	44	--	--	--	--	--	--	--	--	--	.44	.19
430	--	45	.1	35	585	--	--	4.4	--	--	--	.33	.12
460	1.8	42	.3	40	577	584	--	1.2	--	--	--	.54	.14
--	<1.0	45	--	--	--	--	--	--	--	--	--	.66	.17
--	.8	43	--	--	--	--	--	--	--	--	--	.75	.20
--	6.4	43	--	--	--	--	--	--	--	--	--	--	.26
--	.4	68	--	--	--	--	--	--	--	--	--	--	.25
--	.6	55	--	--	--	--	--	--	--	--	--	--	.20
--	13	68	--	--	--	--	--	--	--	--	--	--	.22
--	5.0	68	--	--	--	--	--	--	--	--	--	--	.16
--	3.8	57	--	--	--	--	--	--	--	--	--	--	.12
--	24	62	--	--	--	--	--	--	--	--	--	--	.20
--	20	64	--	--	--	--	--	--	--	--	--	--	.28
--	.4	58	--	--	--	--	--	--	--	--	--	--	.32

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
CT-74	09-26-83	45.38	196	--	--	--	--	230	--	56	21	--	--
	03-20-84	14.71	196	--	7.1	20.0	--	230	--	59	20	--	--
	10-23-84	21.18	196	--	7.3	20.0	--	240	--	58	22	--	--
	03-25-85	7.98	196	--	7.1	21.5	--	250	--	64	22	--	--
	10-11-85	23.96	196	--	7.1	20.5	--	260	--	62	26	--	--
	04-02-86	15.10	196	--	7.3	20.0	--	290	--	70	28	--	--
	08-28-86	20.54	196	--	7.1	20.5	--	290	--	71	28	--	--
	06-15-87	13.34	196	--	7.2	20.0	--	330	--	85	28	--	--
	06-23-88	20.40	196	1,290	7.2	21.0	0	300	--	80	25	170	4.7
	04-18-89	8.30	196	1,320	7.2	21.0	5	290	--	70	28	170	4.5
	03-26-91	10.56	196	1,330	7.2	21.0	5	281	--	73	24	190	5.3
	04-28-92	13.37	196	1,300	7.2	21.5	--	270	--	72	22	190	5.0
CT-75	04-21-70	--	107	741	--	--	7	340	0	96	25	27	6.0
	10-18-72	--	107	690	--	--	--	330	--	91	24	--	--
	11-28-72	--	107	751	--	--	--	320	--	91	23	--	--
	12-19-72	--	107	750	--	--	--	320	--	92	23	--	--
	10-01-73	--	107	--	--	--	--	320	--	--	--	--	--
	12-03-73	5.77	107	752	--	20.0	--	450	--	--	--	--	--
	09-23-74	8.08	107	755	6.9	19.5	5	340	0	92	26	32	7.1
	10-25-74	9.47	107	746	--	19.5	--	340	--	--	--	--	--
	11-29-74	7.68	107	657	6.8	20.0	--	340	--	--	--	--	--
	12-19-74	6.49	107	743	6.9	20.0	--	340	--	--	--	--	--
	01-28-75	3.98	107	748	7.1	20.0	--	330	--	--	--	--	--
	07-21-75	2.45	107	756	6.9	19.5	0	330	0	98	20	29	5.7
	10-29-75	9.08	107	725	7.1	20.0	0	330	0	86	28	30	6.8
	03-23-76	5.65	107	745	6.8	20.0	--	340	--	--	--	--	--
	06-29-76	8.10	107	749	6.6	20.0	--	340	--	--	--	--	--
	10-26-76	13.21	107	751	7.0	20.0	0	330	0	92	24	29	6.4
	03-30-77	9.70	107	730	6.9	20.0	10	320	0	100	18	30	6.9
	09-16-77	13.25	107	750	7.0	20.0	--	340	--	--	--	--	--
	03-28-78	10.43	107	714	7.0	20.0	--	310	--	--	--	--	--
	09-25-78	14.10	107	863	7.0	20.0	--	320	--	--	--	--	--
	11-28-79	14.21	107	714	--	20.0	--	320	--	--	--	--	--
	04-10-80	9.40	107	--	7.0	20.0	--	320	--	--	--	--	--
	09-19-80	16.27	107	--	6.9	20.0	--	320	--	--	--	--	--
	04-28-81	18.37	107	--	7.0	20.0	--	310	--	--	--	--	--
	09-28-81	18.76	107	--	6.9	20.0	--	310	--	--	--	--	--
	04-19-82	16.52	107	--	7.0	20.0	--	320	--	--	--	--	--
	09-21-82	18.17	107	--	6.9	20.0	--	310	--	--	--	--	--
	04-19-83	9.82	107	--	6.8	20.0	--	320	--	88	25	--	--
	03-25-85	7.32	107	--	6.7	21.0	--	330	--	91	26	--	--
	10-11-85	14.77	107	--	7.1	20.0	--	320	--	85	25	--	--
	04-02-86	11.08	107	--	7.2	20.0	--	360	--	100	27	--	--
	08-28-86	16.33	107	--	7.1	20.5	--	340	--	94	25	--	--
	06-15-87	10.57	107	--	7.1	20.0	--	340	--	95	25	--	--
	06-23-88	15.42	107	740	7.0	21.0	0	350	--	100	24	32	5.8
	04-19-89	7.96	107	738	7.2	20.5	5	310	--	86	23	30	6.6
	04-12-90	6.80	107	766	7.2	20.0	0	330	--	94	22	30	6.7

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	1.6	58	--	--	--	--	--	--	--	--	--	--	0.21
--	.3	66	--	--	--	--	--	--	--	--	--	1.2	.24
--	.2	77	--	--	--	--	--	--	--	--	--	1.3	.31
--	.2	86	--	--	--	--	--	--	--	--	--	1.2	.28
--	1.6	110	--	--	--	--	--	--	--	--	--	1.3	.40
--	.4	130	--	--	--	--	--	--	--	--	--	1.4	.48
--	2.2	130	--	--	--	--	--	--	--	--	--	1.4	.29
472	6.0	130	--	--	--	--	--	--	--	--	--	1.5	.40
486	16	130	0.2	35	743	755	<0.01	--	--	--	<0.02	1.6	.76
509	8.2	130	.4	35	745	753	<.01	--	--	--	<.02	1.5	.37
523	1.2	130	.3	34	763	774	<.01	--	--	--	.02	1.5	.36
523	2.8	130	.3	33	780	770	<.01	--	--	--	.02	1.3	.27
380	.4	26	.5	34	432	446	--	0.0	--	--	--	4.8	.60
--	--	28	--	--	--	--	--	--	--	--	--	--	--
--	--	30	--	--	--	--	--	--	--	--	--	--	--
--	--	26	--	--	--	--	--	--	--	--	--	--	--
--	--	28	--	--	--	--	--	--	--	--	--	--	--
--	--	34	--	--	--	--	--	--	--	--	--	2.0	--
360	.4	28	.2	38	485	444	--	.30	--	--	--	5.2	.72
--	2.4	27	--	--	--	--	--	--	--	--	--	5.3	.73
--	2.2	28	--	--	--	--	--	--	--	--	--	5.2	.70
--	2.2	30	--	--	--	--	--	--	--	--	--	5.3	.68
--	.4	27	--	--	--	--	--	--	--	--	--	5.3	.68
360	<1.0	29	.2	41	445	441	--	.03	--	--	--	5.0	.65
350	.8	29	.3	39	444	436	--	.07	--	--	--	5.0	.76
--	<1.0	25	--	--	--	--	--	--	--	--	--	5.4	.78
--	1.2	26	--	--	--	--	--	--	--	--	--	5.5	.80
340	<1.0	25	.1	42	435	434	--	11	--	--	--	5.1	.77
350	.4	28	.2	52	436	454	--	.38	--	--	--	5.3	.72
--	<1.0	26	--	--	--	--	--	--	--	--	--	5.3	.77
--	.8	31	--	--	--	--	--	--	--	--	--	5.2	.95
--	.4	32	--	--	--	--	--	--	--	--	--	4.9	.84
--	1.2	26	--	--	--	--	--	--	--	--	--	5.1	.74
--	3.2	24	--	--	--	--	--	--	--	--	--	5.3	.76
--	4.4	24	--	--	--	--	--	--	--	--	--	4.9	.70
--	.2	26	--	--	--	--	--	--	--	--	--	4.8	.73
--	.6	29	--	--	--	--	--	--	--	--	--	4.7	.70
--	.2	29	--	--	--	--	--	--	--	--	--	4.7	.69
--	.2	27	--	--	--	--	--	--	--	--	--	4.9	.74
--	.8	28	--	--	--	--	--	--	--	--	--	5.0	.68
--	.2	28	--	--	--	--	--	--	--	--	--	5.2	.67
--	1.0	30	--	--	--	--	--	--	--	--	--	5.1	.62
--	.6	26	--	--	--	--	--	--	--	--	--	5.2	.56
--	.4	27	--	--	--	--	--	--	--	--	--	5.5	.84
364	.2	28	--	--	--	--	--	--	--	--	--	5.1	1.1
371	12	22	.2	42	419	466	<.01	.20	--	--	<.02	5.1	--
357	<.1	28	.2	42	422	422	<.01	--	--	--	<.02	4.6	.56
370	1.2	26	.4	43	423	451	<.01	--	--	--	<.02	5.2	.72

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
CT- 81	04-21-70	--	108	868	--	--	7	350	0	88	31	58	2.5
	09-19-74	14.59	108	898	6.6	20.0	--	440	--	--	--	--	--
	10-25-74	17.85	108	890	7.1	20.0	--	360	--	--	--	--	--
	11-29-74	9.80	108	859	6.7	20.0	--	350	--	--	--	--	--
	12-19-74	6.79	108	890	6.7	20.5	--	350	--	--	--	--	--
	01-28-75	6.29	108	917	6.8	20.0	--	350	--	--	--	--	--
	04-05-75	+0.97	108	901	6.7	20.0	10	350	0	88	32	63	2.5
	07-21-75	11.46	108	917	6.8	20.0	0	330	0	87	27	70	2.5
	10-29-75	22.28	108	891	6.9	20.0	0	340	0	90	28	66	3.0
	03-23-76	11.55	108	900	7.1	20.0	--	350	--	--	--	--	--
	06-28-76	18.23	108	879	7.1	20.0	--	350	--	--	--	--	--
	10-22-76	25.35	108	928	6.9	--	5	360	0	81	38	65	2.7
	03-30-77	16.50	108	934	7.1	20.0	10	350	0	96	27	65	3.1
	09-16-77	25.55	108	926	7.1	20.0	--	340	--	--	--	--	--
	03-28-78	17.78	108	695	6.5	20.0	--	350	--	--	--	--	--
	09-25-78	26.85	108	1,080	--	--	--	370	--	--	--	--	--
	05-14-79	31.10	108	862	--	--	--	340	--	--	--	--	--
	11-28-79	44.42	108	826	--	--	--	320	--	--	--	--	--
	04-10-80	37.25	108	--	--	--	--	320	--	--	--	--	--
	09-19-80	49.74	108	--	--	--	--	310	--	--	--	--	--
	04-28-81	49.18	108	--	--	--	--	310	--	--	--	--	--
	09-28-81	48.80	108	--	--	--	--	330	--	--	--	--	--
	04-20-82	40.92	108	--	--	--	--	290	--	--	--	--	--
	09-21-82	42.36	108	--	--	--	--	290	--	--	--	--	--
	04-19-83	33.60	108	--	--	--	--	300	--	72	29	--	--
	09-26-83	42.30	108	--	--	--	--	320	--	81	28	--	--
	03-22-84	13.40	108	--	6.8	20.0	--	300	--	74	27	--	--
	10-23-84	20.00	108	--	7.0	21.0	--	310	--	70	32	--	--
	03-25-85	7.04	108	--	6.7	21.0	--	310	--	75	30	--	--
	10-11-85	22.72	108	--	7.0	21.0	--	290	--	69	29	--	--
	04-02-86	14.00	108	--	7.1	20.0	--	320	--	80	30	--	--
	08-28-86	19.03	108	--	7.0	20.5	--	300	--	75	27	--	--
	06-15-87	11.30	108	--	6.9	20.0	--	310	--	75	29	--	--
	06-23-88	18.90	108	877	6.9	22.0	5	280	--	70	26	80	2.3
	04-20-89	7.61	108	881	7.0	20.5	10	310	--	73	30	81	2.4
	04-16-90	3.52	108	844	7.2	20.5	5	340	0	80	33	72	2.6
CT-96	02-05-76	18.93	76	1,980	7.1	--	5	1,000	0	250	92	61	5.4
	03-23-76	10.36	76	--	6.7	--	--	940	--	--	--	--	--
	05-28-76	14.66	76	1,970	7.0	--	--	940	--	--	--	--	--
	06-28-76	16.28	76	1,940	6.9	--	60	940	300	250	77	76	4.4
	10-22-76	23.31	76	2,090	6.8	--	5	980	360	160	140	81	4.4
	03-30-77	14.61	76	2,080	7.1	--	20	1,000	290	260	95	79	5.1
	09-16-77	23.46	76	2,010	--	--	--	970	--	--	--	--	--
	03-28-78	16.19	76	2,120	6.6	--	--	1,000	--	--	--	--	--
	09-25-78	26.34	76	2,370	--	--	--	1,000	--	--	--	--	--
	04-02-86	14.61	76	--	6.9	--	--	1,150	--	280	110	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
450	0.8	28	0.4	25	491	509	--	11	--	--	--	6.8	0.60
--	<1.0	32	--	--	--	--	--	--	--	--	--	7.6	.63
--	8.6	44	--	--	--	--	--	--	--	--	--	7.5	.65
--	3.2	34	--	--	--	--	--	--	--	--	--	8.1	.60
--	4.6	36	--	--	--	--	--	--	--	--	--	7.6	.60
--	3.0	34	--	--	--	--	--	--	--	--	--	6.8	.58
420	<1.0	35	.3	35	530	537	<0.01	--	0.0	--	5.0	7.6	.56
440	<1.0	36	.2	35	535	527	--	.05	--	--	--	7.4	.55
420	2.6	39	.3	31	520	512	--	.25	--	--	--	--	.61
--	<1.0	35	--	--	--	--	--	--	--	--	--	7.6	.65
--	.6	35	--	--	--	--	--	--	--	--	--	6.8	.67
450	<1.0	35	.1	36	531	551	--	23	--	--	--	6.3	.60
440	.4	36	.3	45	521	544	--	.11	--	--	--	7.5	.58
--	<1.0	37	--	--	--	--	--	--	--	--	--	7.3	.59
--	<.2	38	--	--	--	--	--	--	--	--	--	7.2	.60
--	<.2	39	--	--	--	--	--	--	--	--	--	--	.66
--	<.2	52	--	--	--	--	--	--	--	--	--	--	.57
--	2.4	35	--	--	--	--	--	--	--	--	--	--	.47
--	1.8	31	--	--	--	--	--	--	--	--	--	--	.53
--	.4	24	--	--	--	--	--	--	--	--	--	--	.51
--	1.6	25	--	--	--	--	--	--	--	--	--	--	.53
--	.2	28	--	--	--	--	--	--	--	--	--	--	.58
--	.2	27	--	--	--	--	--	--	--	--	--	--	.53
--	.2	21	--	--	--	--	--	--	--	--	--	--	.60
--	.6	19	--	--	--	--	--	--	--	--	--	--	.57
--	2.4	20	--	--	--	--	--	--	--	--	--	--	.51
--	.6	20	--	--	--	--	--	--	--	--	--	7.9	.55
--	.8	19	--	--	--	--	--	--	--	--	--	7.2	.56
--	.2	17	--	--	--	--	--	--	--	--	--	7.7	.58
--	2.2	24	--	--	--	--	--	--	--	--	--	7.2	.42
--	.6	19	--	--	--	--	--	--	--	--	--	7.5	.52
--	.4	19	--	--	--	--	--	--	--	--	--	7.5	.60
442	.2	19	--	--	--	--	--	--	--	--	--	7.1	.84
459	--	19	.2	32	493	530	<.01	--	--	--	<.02	6.3	.92
461	.2	22	.3	33	501	527	<.01	--	--	--	<.02	7.5	.69
468	2.6	25	.4	34	500	539	<.01	--	--	--	<.02	7.8	.64
630	220	180	.2	44	--	1,240	--	1.1	--	--	--	8.5	3.2
--	200	180	--	--	--	--	--	--	--	--	--	7.9	2.6
--	150	170	--	--	--	--	--	--	--	--	--	8.4	2.7
630	180	180	.2	39	1,330	1,190	--	6.7	--	--	--	7.8	2.6
640	240	190	.1	36	1,260	1,250	--	7.8	--	--	--	7.7	2.7
750	220	180	.2	46	1,580	1,340	--	.79	--	--	--	8.2	2.7
--	210	170	--	--	--	--	--	--	--	--	--	--	2.3
--	290	200	--	--	--	--	--	--	--	--	--	8.3	3.0
--	230	180	--	--	--	--	--	--	--	--	--	--	--
--	140	220	--	--	--	--	--	--	--	--	--	15	3.0

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
CT-96	08-28-86	19.86	76	--	6.8	--	--	1,100	--	270	100	--	--
	06-15-87	11.98	76	--	6.9	--	--	1,110	--	280	100	--	--
	09-19-88	20.85	76	2,110	7.0	--	10	1,100	0	280	90	100	4.2
	04-18-89	7.84	76	--	6.9	21.0	10	990	--	250	88	88	5.6
	03-26-91	10.17	76	1,930	6.9	22.0	5	950	--	250	79	81	4.3
	04-28-92	12.96	76	1,910	6.8	--	--	870	--	230	71	85	4.0
R-733	04-23-58	--	80	--	--	--	--	790	--	--	--	--	--
	10-08-58	--	80	--	--	21.0	--	740	--	--	--	--	--
	06-02-67	--	80	1,980	6.4	--	--	--	--	--	--	--	--
	07-08-80	--	80	1,060	--	--	--	580	--	--	--	--	--
	09-25-81	26.90	80	--	--	--	--	600	--	--	--	--	--
	04-16-82	21.63	80	--	6.8	20.0	--	600	--	--	--	--	--
	09-22-83	25.95	80	--	7.5	--	--	610	--	120	76	--	--
	03-14-84	13.22	80	--	6.7	21.0	--	620	--	120	78	--	--
	10-12-84	23.57	80	--	--	--	--	620	--	110	85	--	--
	03-19-85	11.57	80	--	6.9	21.5	--	620	--	120	77	--	--
	10-04-85	23.12	80	--	--	--	--	650	--	120	85	--	--
	04-01-86	18.60	80	--	6.9	--	--	730	--	140	92	--	--
	10-30-86	17.94	80	--	6.6	20.5	--	740	--	140	95	--	--
	06-15-87	13.65	80	--	6.8	20.5	--	760	--	150	93	--	--
	07-01-88	20.08	80	1,390	6.8	21.0	0	750	100	150	90	80	1.8
	04-16-90	5.18	80	1,480	7.0	--	0	720	--	130	95	75	1.6
R- 744	10-08-58	--	84	--	--	20.0	--	750	--	--	--	--	--
	11-03-58	--	84	--	--	--	--	750	--	--	--	--	--
	06-02-67	--	84	1,810	6.3	--	--	--	--	--	--	--	--
	04-14-76	6.65	84	1,500	6.8	20.0	0	690	260	180	58	68	3.0
	08-05-76	8.33	84	1,490	7.0	--	--	690	--	--	--	--	--
	04-14-77	6.75	84	1,490	7.0	--	--	690	--	--	--	--	--
	10-27-77	8.99	84	1,480	6.8	--	5	680	240	170	62	66	4.3
	03-30-78	6.95	84	1,120	6.5	--	--	680	--	--	--	--	--
	05-17-79	6.25	84	1,440	6.7	--	--	680	--	--	--	--	--
	10-24-79	9.02	84	--	6.7	21.0	--	660	--	--	--	--	--
	03-19-80	6.05	84	1,410	7.0	--	--	650	--	--	--	--	--
	09-24-80	12.27	84	--	6.8	20.0	--	700	--	--	--	--	--
	04-22-81	12.32	84	--	6.6	20.0	--	680	--	--	--	--	--
	09-23-81	13.85	84	--	6.7	20.0	--	700	--	--	--	--	--
	04-15-82	8.29	84	--	6.7	20.0	--	690	--	--	--	--	--
	09-01-82	11.13	84	--	6.8	20.0	--	690	--	--	--	--	--
	04-20-83	4.08	84	--	6.8	--	--	700	--	180	62	--	--
	03-29-85	5.91	84	--	6.4	21.0	--	620	--	150	60	--	--
	10-07-85	8.78	84	--	7.1	20.0	--	650	--	160	60	--	--
	04-03-86	6.96	84	--	6.8	19.5	--	750	--	180	74	--	--
	10-30-86	9.21	84	--	6.6	20.0	--	710	--	170	70	--	--
	06-15-87	6.44	84	--	6.8	20.0	--	740	--	190	65	--	--

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	250	210	--	--	--	--	--	--	--	--	--	13	2.6
747	240	210	--	--	--	--	--	--	--	--	--	9.8	3.7
789	210	180	0.4	39	1,130	1,390	<0.01	--	--	--	0.03	6.0	3.1
767	180	170	.2	39	1,370	1,290	<.01	--	--	--	<.02	6.1	2.8
788	110	160	.2	39	1,200	1,200	<.01	--	--	--	.02	5.9	2.1
782	110	150	.2	38	1,200	1,160	<.01	--	--	--	<.02	5.5	2.0
--	350	60	--	--	--	--	--	--	--	--	--	--	--
--	--	68	--	--	--	--	--	--	--	--	--	--	--
--	350	--	--	--	--	--	--	--	--	--	--	--	--
--	93	26	--	--	--	--	--	--	--	--	--	--	.69
--	91	27	--	--	--	--	--	--	--	--	--	--	.65
--	80	30	--	--	--	--	--	--	--	--	--	4.6	.71
--	110	32	--	--	--	--	--	--	--	--	--	3.3	.72
--	120	31	--	--	--	--	--	--	--	--	--	3.6	.72
--	120	34	--	--	--	--	--	--	--	--	--	3.4	.74
--	120	21	--	--	--	--	--	--	--	--	--	3.6	.78
--	82	41	--	--	--	--	--	--	--	--	--	--	.76
--	110	33	--	--	--	--	--	--	--	--	--	3.2	.84
--	120	34	--	--	--	--	--	--	--	--	--	3.1	.96
628	140	39	--	--	--	--	--	--	--	--	--	4.8	1.2
644	150	35	.4	29	706	928	<.01	--	--	--	.02	4.3	1.2
686	190	35	.3	31	946	974	<.01	--	--	--	<.02	3.7	1.2
--	--	150	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	310	--	--	--	--	--	--	--	--	--	--	--	--
430	220	130	.3	42	1,050	965	--	0.0	--	--	--	6.1	.23
--	210	120	--	--	--	--	--	--	--	--	--	6.4	.26
--	220	120	--	--	--	--	--	--	--	--	--	6.8	.22
450	210	120	.1	36	995	947	--	.0	--	--	--	6.7	.25
--	--	140	--	--	--	--	--	--	--	--	--	5.2	.28
--	190	140	--	--	--	--	--	--	--	--	--	6.7	.27
--	140	120	--	--	--	--	--	--	--	--	--	6.2	.23
--	170	120	--	--	--	--	--	--	--	--	--	7.0	.27
--	190	130	--	--	--	--	--	--	--	--	--	7.2	.24
--	230	120	--	--	--	--	--	--	--	--	--	7.3	.26
--	220	120	--	--	--	--	--	--	--	--	--	7.3	.25
--	180	140	--	--	--	--	--	--	--	--	--	7.5	.24
--	170	120	--	--	--	--	--	--	--	--	--	7.1	.25
--	230	120	--	--	--	--	--	--	--	--	--	7.2	.32
--	240	140	--	--	--	--	--	--	--	--	--	6.8	.36
--	290	140	--	--	--	--	--	--	--	--	--	5.7	.36
--	230	130	--	--	--	--	--	--	--	--	--	7.6	.46
--	200	120	--	--	--	--	--	--	--	--	--	6.9	.24
449	210	130	--	--	--	--	--	--	--	--	--	7.4	.28

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Well no.	Date	Water level below land surface (ft)	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, field (standard units)	Temperature of water (°C)	Color (platinum-cobalt units)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb whole water total field (mg/L as $CaCO_3$)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)
R-963	11-02-72	--	60	1,060	--	--	--	510	--	88	71	--	--
	11-28-72	--	60	1,000	--	--	--	540	--	100	70	--	--
	12-19-72	--	60	1,100	--	--	--	530	--	98	70	--	--
	02-14-73	--	60	1,070	--	--	--	570	--	110	71	--	--
	06-19-73	--	60	1,110	--	--	--	570	--	110	72	--	--
	08-08-73	--	60	--	--	--	--	590	--	--	--	--	--
	03-25-74	7.60	60	1,210	7.1	--	--	640	--	--	--	--	--
	02-19-75	5.55	60	1,160	6.9	21.0	--	600	--	--	--	--	--
	03-05-75	5.48	60	1,160	6.8	20.5	--	600	--	--	--	--	--
	06-17-75	4.18	60	1,150	6.5	20.5	0	580	0	120	67	50	0.6
	04-09-76	9.29	60	1,140	6.6	20.5	5	590	0	130	64	43	.7
	11-01-76	19.48	60	1,160	6.6	--	0	530	0	110	62	44	.7
	04-15-77	7.67	60	1,130	6.9	--	--	580	0	--	--	--	--
	10-27-77	18.95	60	1,020	6.9	--	--	600	50	120	--	--	--
	03-30-78	12.76	60	953	6.9	--	--	490	--	--	--	--	--
	09-27-78	21.50	60	862	6.9	--	--	480	--	--	--	--	--
	03-28-79	7.93	60	902	7.0	--	--	490	--	--	--	--	--
	10-24-79	17.47	60	--	6.9	21.0	--	530	--	--	--	--	--
	03-19-80	11.58	60	936	6.8	20.5	--	500	--	--	--	--	--
	09-23-80	21.07	60	--	6.9	--	--	490	--	--	--	--	--
	04-22-81	20.70	60	--	6.7	--	--	490	--	--	--	--	--
	09-23-81	21.60	60	--	6.9	--	--	500	--	--	--	--	--
	04-15-82	18.25	60	--	6.9	--	--	510	--	--	--	--	--
	03-14-84	8.57	60	--	--	--	--	510	--	100	63	--	--
	06-05-85	11.18	60	--	7.1	21.0	--	600	--	120	73	--	--
	10-04-85	17.70	60	--	7.1	21.0	--	500	--	88	68	--	--
	04-02-86	13.23	60	--	7.0	20.0	--	570	--	95	80	--	--
	08-27-86	16.30	60	--	7.1	21.0	--	510	--	80	75	--	--
	06-15-87	10.35	60	--	6.9	20.5	--	580	--	110	75	--	--
	04-13-89	6.26	60	866	7.0	21.0	10	460	--	77	64	18	.5
	04-16-90	4.51	60	855	7.1	21.0	0	470	0	84	64	20	1.0
	03-28-91	9.44	60	977	7.0	22.5	5	497	--	92	65	32	<1.0
	04-01-92	5.82	60	1,030	6.9	22.0	--	550	--	98	74	35	.8
R-1102	04-14-76	6.61	127	1,680	6.9	20.0	0	740	300	190	65	90	3.2
	08-05-76	3.30	127	1,680	6.9	--	--	770	--	--	--	--	--
	04-14-77	6.66	127	1,670	6.9	20.0	--	750	--	--	--	--	--
	10-27-77	8.93	127	169	6.9	--	10	750	290	140	96	100	4.7
	03-30-78	6.87	127	1,700	6.6	--	--	850	--	--	--	--	--
	09-27-78	10.73	127	1,630	6.9	--	--	760	--	--	--	--	--
	05-21-80	4.85	127	--	7.0	20.0	--	720	--	--	--	--	--
	09-24-80	12.24	127	--	7.0	20.0	--	720	--	--	--	--	--
	04-22-81	12.27	127	--	6.8	20.0	--	720	--	--	--	--	--
	09-23-81	13.84	127	--	6.9	--	--	720	--	--	--	--	--
	04-15-82	9.24	127	--	6.9	--	--	700	--	--	--	--	--
	09-01-82	11.02	127	--	6.9	--	--	680	--	--	--	--	--
	10-07-85	10.38	127	--	7.2	20.0	--	670	--	170	59	--	--
	04-03-86	8.61	127	--	7.0	--	--	730	--	180	67	--	--
	08-27-86	9.70	127	--	6.8	20.5	--	760	--	190	70	--	--
	06-15-87	6.46	127	--	6.8	20.0	--	740	--	190	65	--	--
	06-28-88	10.09	127	1,570	6.7	20.0	5	730	190	190	62	110	3.3
	04-20-90	6.12	127	1,580	7.0	20.0	5	720	--	180	66	94	3.1

Table 1. Summary of chemical and physical analyses of water from wells completed in the Red River alluvial aquifer, Louisiana, 1965-92--continued

Alkalinity, as calcium carbonate, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 100 °C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, nitrate total (mg/L as NO_3)	Nitrogen, nitrite dissolved (mg/L as NO_2)	Nitrogen, nitrate dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Iron, dissolved (mg/L as Fe)	Manganese, dissolved (mg/L as Mn)
--	--	10	--	--	--	--	--	--	--	--	--	--	--
--	--	10	--	--	--	--	--	--	--	--	--	--	--
--	--	12	--	--	--	--	--	--	--	--	--	--	--
--	--	8.0	--	--	--	--	--	--	--	--	--	--	--
--	--	12	--	--	--	--	--	--	--	--	--	--	--
--	--	12	--	--	--	--	--	--	--	--	--	--	--
--	46	12	--	--	--	--	--	--	--	--	--	1.6	--
--	44	16	--	--	--	--	--	--	--	--	--	3.1	1.3
--	43	16	--	--	--	--	--	--	--	--	--	2.8	.12
600	39	14	0.4	27	701	681	--	0.36	--	--	--	--	1.6
600	44	12	.5	29	683	686	--	.53	--	--	--	2.6	1.6
580	37	11	.2	30	671	649	--	1.4	--	--	--	2.0	1.6
630	45	9.9	--	--	--	--	--	--	--	--	--	2.1	1.7
550	52	6.6	--	--	--	--	--	--	--	--	--	1.9	1.6
--	34	5.0	--	--	--	--	--	--	--	--	--	1.7	1.6
--	24	4.1	--	--	--	--	--	--	--	--	--	1.4	1.4
--	40	4.0	--	--	--	--	--	--	--	--	--	2.4	1.7
--	45	7.0	--	--	--	--	--	--	--	--	--	--	1.8
--	27	5.6	--	--	--	--	--	--	--	--	--	1.8	1.6
--	25	2.1	--	--	--	--	--	--	--	--	--	1.8	1.5
--	34	2.9	--	--	--	--	--	--	--	--	--	1.9	1.6
--	28	1.8	--	--	--	--	--	--	--	--	--	1.8	1.6
--	28	4.2	--	--	--	--	--	--	--	--	--	1.8	2.2
--	30	2.1	--	--	--	--	--	--	--	--	--	--	1.7
--	36	4.4	--	--	--	--	--	--	--	--	--	1.7	1.6
--	36	5.4	--	--	--	--	--	--	--	--	--	2.2	2.5
--	25	3.4	--	--	--	--	--	--	--	--	--	1.8	1.6
--	27	1.7	--	--	--	--	--	--	--	--	--	2.0	1.7
509	31	3.2	--	--	--	--	--	--	--	--	--	1.9	2.0
474	27	2.6	.6	27	484	504	<0.01	--	--	--	<0.02	1.6	1.1
497	30	7.4	.4	28	513	536	<.01	--	--	--	<.02	1.7	1.6
547	26	2.0	.5	28	560	--	<.01	--	--	--	.02	2.2	2.1
564	44	5.4	.6	30	594	629	<.01	--	--	--	<.02	1.8	1.6
440	300	160	.3	38	1,170	1,120	--	.0	--	--	--	6.1	.20
--	290	140	--	--	--	--	--	--	--	--	--	5.7	.21
--	280	140	--	--	--	--	--	--	--	--	--	5.7	.20
460	280	140	.1	33	1,140	1,070	--	--	--	--	--	--	.20
--	270	150	--	--	--	--	--	--	--	--	--	4.7	.23
--	250	140	--	--	--	--	--	--	--	--	--	4.2	.23
--	240	140	--	--	--	--	--	--	--	--	--	5.8	.22
--	270	140	--	--	--	--	--	--	--	--	--	6.0	.21
--	290	140	--	--	--	--	--	--	--	--	--	6.0	.21
--	270	140	--	--	--	--	--	--	--	--	--	6.1	.18
--	280	150	--	--	--	--	--	--	--	--	--	5.0	.24
--	200	130	--	--	--	--	--	--	--	--	--	4.3	.24
--	200	120	--	--	--	--	--	--	--	--	--	6.7	.44
--	190	120	--	--	--	--	--	--	--	--	--	7.2	.24
--	260	130	--	--	--	--	--	--	--	--	--	6.8	.52
431	200	140	--	--	--	--	--	--	--	--	--	7.1	.52
434	260	120	.2	35	745	1,040	<.01	--	--	--	<.02	6.9	.22
462	270	140	.2	35	1,070	1,070	<.01	--	--	--	<.02	6.1	.18

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