Water-Data Report 2011

07316000 RED RIVER NEAR GAINESVILLE, TX

Red-Lake Texoma Basin
Farmers-Mud Subbasin

LOCATION.--Lat 33°43′40″, long 97°09′35″ referenced to North American Datum of 1927, in SW ¼ sec.36, T.9 S., R.1 E., Love County, OK, Hydrologic Unit 11130201, on downstream right bank at end of bridge on Interstate 35, 0.2 mi downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 5.0 mi downstream from Fish Creek, 4.5 mi southwest of Thackerville, OK, 7.0 mi north of Gainesville, and at mile 791.5.

DRAINAGE AREA.--30,782 mi^2 of which 5,936 mi^2 probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--May 1936 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 627.91 ft above NGVD of 1929. Prior to Jan. 17, 1939, and Feb. 13, 1965 to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Records poor. Flow regulated by Lake Kemp (station 07312000 in Texas), since 1943 by Lake Altus (station 07302500 in Oklahoma), since 1946 by Lake Kickapoo (station 07314000 in Texas), since 1967 by Lake Arrowhead (station 07314800 in Texas) and Moss Lake (station 07315950 in Texas), since 1978 by Waurika Lake (07313400 in Oklahoma). U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,910 ft^3/s, May 24, gage height, 13.05 ft; minimum discharge, 21 ft^3/s, Sept. 6, 7, 8, 9, gage height, 7.96 ft.

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 07316000, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/07316000.2011.pdf

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	517	774	365	385	401	335	259	602	477	112	43	24
2	493	681	362	363	451	318	252	704	436	110	40	25
3	472	607	354	344	329	318	248	573	402	105	39	27
4	451	547	348	349	e340	323	245	413	370	101	37	27
5	438	512	344	345	365	323	253	345	342	97	35	25
6	427	481	339	332	415	313	e241	307	315	94	34	25
7	419	459	340	332	500	e309	240	296	291	92	33	24
8	412	439	335	332	e505	290	235	275	268	90	31	24
9	401	427	333	351	e480	282	219	262	253	85	28	27
10	392	408	341	364	491	283	238	251	240	82	e28	33
11	460	399	340	359	465	274	276	269	230	78	27	36
12	500	388	e338	349	446	277	249	382	228	77	37	38
13	499	400	334	351	423	277	225	371	224	74	39	37
14	433	376	332	349	422	269	e225	322	210	72	45	42
15	406	359	329	350	419	273	e224	266	201	71	41	43
16	399	e355	329	355	e380	260	214	232	189	72	44	41
17	386	e351	327	356	e400	e263	e212	215	177	69	53	46
18	384	347	323	359	412	266	e209	201	178	e67	42	49
19	414	346	e320	356	e410	260	e202	192	176	e65	37	61
20	399	464	e325	363	410	256	198	326	164	63	37	61
21	377	566	327	370	402	e260	215	330	159	63	38	65
22	373	513	328	367	385	e263	e217	391	161	e62	37	75
23	393	478	e330	382	374	266	e250	1,300	151	61	38	100
24	424	443	382	385	375	255	e306	3,680	142	59	37	111
25	437	429	394	376	363	245	295	2,790	136	57	36	99
26	442	442	389	378	e357	248	745	1,900	e130	54	33	87
27	1,290	410	360	374	e361	236	836	1,270	124	54	34	79
28	1,980	e395	354	371	e348	240	546	909	120	e50	32	70
29	1,430	384	419	370	---	248	394	712	116	47	e30	64
30	1,090	371	422	370	---	257	354	588	118	46	e28	60
31	900	---	405	365	---	253	---	530	---	45	27	---
Total	17,838	13,551	10,868	11,152	11,429	8,540	8,822	21,204	6,728	2,274	1,120	1,525
Mean	575	452	351	360	408	275	294	684	224	73.4	36.1	50.8
Max	1,980	774	422	385	505	335	836	3,680	477	112	53	111
Min	373	346	320	332	329	236	198	192	116	45	27	24
Ac-ft	35,380	26,880	21,560	22,120	22,670	16,940	17,500	42,060	13,340	4,510	2,220	3,020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3,440	2,056	1,512	1,297	1,881	2,733	3,478	7,459	7,620	2,393	1,650	2,259
Max	31,080	14,020	14,990	7,258	10,920	19,590	27,400	47,780	43,510	23,390	20,730	12,880
(WY)	(1942)	(1942)	(1992)	(1998)	(2001)	(1998)	(1990)	(1957)	(1941)	(2007)	(1995)	(1986)
Min	119	137	125	82.4	151	90.5	153	204	224	73.4	36.1	50.8
(WY)	(1953)	(1955)	(1940)	(1940)	(1953)	(1940)	(1971)	(1971)	(2011)	(2011)	(2011)	(2011)

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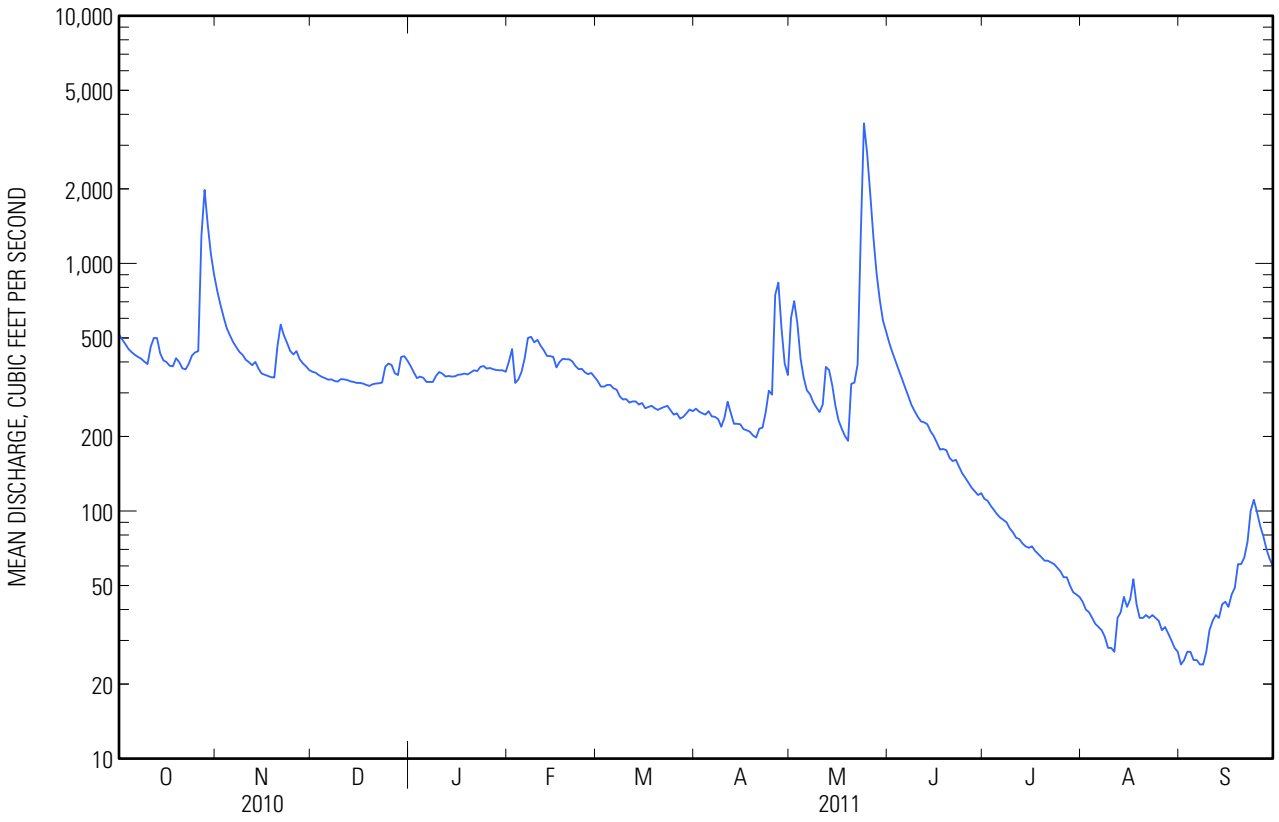
SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1937 - 2011	
Annual total	945,692		115,051			
Annual mean	2,591		315		3,150	
Highest annual mean					11,890	1987
Lowest annual mean					315	2011
Highest daily mean	24,800	Apr 20	3,680	May 24	232,000	May 31, 1987
Lowest daily mean	[a]320	Dec 19	24	Sep 1[b]	24	Sep 1, 2011[b]
Annual seven-day minimum	326	Dec 16	25	Sep 1	25	Sep 1, 2011
Maximum peak flow			3,910	May 24	265,000	May 31, 1987
Maximum peak stage			13.05	May 24	40.08	May 31, 1987
Annual runoff (ac-ft)	1,876,000		228,200		2,282,000	
10 percent exceeds	6,540		479		7,000	
50 percent exceeds	998		322		813	
90 percent exceeds	384		39		215	

[a] Estimated
[b] Also Sep 7-8, 2011.



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1994 to 2007 and 2009. October 2009 to September 30, 2011 (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1994 to September 2009, October 2009 to September 2011 (discontinued). Data available upon request.
WATER TEMPERATURE: October 1994 to September 2009, October 2009 to September 2011 (discontinued). Data available upon request.

INSTRUMENTATION.--Water-quality monitor since October 1994 to September 30, 2011 (discontinued). QW monitoring equipment consists of two parameter Hydrolab Reporter suspended vertically within polyethylene protection tube. Equipment removed.

REMARKS.--Samples were collected periodically by the U.S. Geological Survey. Specific conductance, pH, water temperature, air temperature, dissolved oxygen, and alkalinity were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 12,600 microsiemens Apr. 19, 2004; minimum, 98 microsiemens Aug. 17, 2005.
WATER TEMPERATURE: Maximum, 39.8 C Aug.03, 2008; minimum, -0.5°C Jan. 4, 5, 1999.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 1 of 8

[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft^3/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)
11-03-2010	**1430**	748	23.5	603	11.2	116	8.1	5,530	15.2	3,250
01-05-2011	**1230**	744	12.4	342	12.3	107	8.8	4,370	7.3	3,120
03-14-2011	**0900**	748	6.4	275	9.5	92	8.0	6,340	12.2	4,150
05-26-2011	**1200**	748	27.3	1,870	6.3	73	7.7	961	21.8	538
07-21-2011	**1630**	750	43.8	118	11.0	163	8.3	6,820	34.6	4,340

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 2 of 8

[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Dissolved solids, water, filtered, tons per acre-foot (70303)	Dissolved solids, water, tons per day (70302)	Hardness, water, mg/L as $CaCO_3$ (00900)	Noncarbonate hardness, water, filtered, field, mg/L as $CaCO_3$ (00904)	Suspended solids, water, unfiltered, mg/L (00530)	Calcium, water, filtered, mg/L (00915)	Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)
11-03-2010	**1430**	4.42	5,290	760	644	495	214	54.4	9.15	12.7
01-05-2011	**1230**	4.25	2,880	863	752	104	215	79.1	6.74	10.9
03-14-2011	**0900**	5.64	3,080	1,160	1,020	100	285	108	9.27	13.0
05-26-2011	**1200**	.73	2,720	196	97	830	52.5	15.8	6.78	3.42
07-21-2011	**1630**	5.91	1,380	1,080	1,030	50	254	109	14.3	13.0

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 3 of 8

[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Sodium fraction of cations, water, percent in equivalents of major cations (00932)	Sodium, water, filtered, mg/L (00930)	Alkalinity, water, filtered, inflection-point, incremental titration method, field, mg/L as $CaCO_3$ (39086)	Bicarbonate, water, filtered, inflection-point, incremental titration method, field, mg/L (00453)	Carbon dioxide, water, unfiltered, mg/L (00405)	Carbonate, water, filtered, inflection-point incremental titration method, field, mg/L (00452)	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)
11-03-2010	**1430**	69	806	116	141	2.0	< 1	1,500	.40
01-05-2011	**1230**	65	735	112	135	.4	< 1	1,350	.37
03-14-2011	**0900**	65	1,020	134	160	2.8	1	1,800	.40
05-26-2011	**1200**	54	110	99	120	4.1	< 1	177	.24
07-21-2011	**1630**	66	986	54.6	65.3	.5	< 1.0	1,890	.52

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 4 of 8

[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Silica, water, filtered, mg/L as SiO_2 (00955)	Sulfate, water, filtered, mg/L (00945)	Ammonia plus organic nitrogen, water, unfiltered, mg/L as N (00625)	Ammonia, water, filtered, mg/L as NH4 (71846)	Ammonia, water, filtered, mg/L as N (00608)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Nitrate, water, filtered, mg/L (71851)	Nitrate, water, filtered, mg/L as N (00618)	Nitrite, water, filtered, mg/L (71856)
11-03-2010	**1430**	8.4	580	1.1	.079	.062	.85	3.72	.840	.046
01-05-2011	**1230**	2.3	669	1.0	< .013	< .010	< .02	< .081	< .018	.005
03-14-2011	**0900**	2.2	845	1.0	< .013	< .010	.02	.089	.020	< .003
05-26-2011	**1200**	8.9	105	2.5	.196	.152	.37	1.23	.278	.299
07-21-2011	**1630**	6.0	1,050	1.4	.014	.011	.07	.293	.066	.006

07316000 RED RIVER NEAR GAINESVILLE, TX—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 5 of 8
[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Nitrite, water, filtered, mg/L as N (00613)	Organic nitrogen, water, unfiltered, mg/L (00605)	Orthophosphate, water, filtered, mg/L (00660)	Orthophosphate, water, filtered, mg/L as P (00671)	Phosphorus, water, filtered, mg/L as P (00666)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, unfiltered, mg/L (00600)	Barium, water, filtered, µg/L (01005)
11-03-2010	1430	.014	1.1	.181	.059	.06	.42	2.0	175
01-05-2011	1230	.002	< 1.0	.014	.005	< .02	.15	< 1.0	108
03-14-2011	0900	< .001	< 1.0	< .012	< .004	< .02	.17	1.1	119
05-26-2011	1200	.091	2.3	.219	.071	.08	.78	2.9	88
07-21-2011	1630	.002	1.4	.019	.006	< .02	.13	1.4	149

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
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[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barium, water, unfiltered, recoverable, µg/L (01007)	Cadmium, water, filtered, µg/L (01025)	Cadmium, water, unfiltered, µg/L (01027)	Chromium, water, filtered, µg/L (01030)	Chromium, water, unfiltered, recoverable, µg/L (01034)	Copper, water, filtered, µg/L (01040)	Copper, water, unfiltered, recoverable, µg/L (01042)	Iron, water, filtered, µg/L (01046)	Iron, water, unfiltered, recoverable, µg/L (01045)
11-03-2010	1430	242	< .05	< .20	.56	9.3	< 1.5	11.1	< 10	6,230
01-05-2011	1230	143	< .05	< .15	< .18	1.8	< 1.5	2.2	13	1,310
03-14-2011	0900	139	< .05	< .15	< .18	1.6	2.0	< 2.1	20	1,110
05-26-2011	1200	359	< .02	.14	.12	11.6	2.3	15.0	38	9,580
07-21-2011	1630	197	< .05	< .15	< .18	.97	< 1.5	< 2.1	< 13	456

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
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[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Lead, water, filtered, µg/L (01049)	Lead, water, unfiltered, recoverable, µg/L (01051)	Manganese, water, filtered, µg/L (01056)	Manganese, water, unfiltered, recoverable, µg/L (01055)	Mercury, water, filtered, µg/L (71890)	Mercury, water, unfiltered, recoverable, µg/L (71900)	Nickel, water, filtered, µg/L (01065)	Nickel, water, unfiltered, recoverable, µg/L (01067)	Silver, water, filtered, µg/L (01075)
11-03-2010	1430	< .04	6.38	2.7	301	< .005	< .005	1.5	13.7	< .01
01-05-2011	1230	.17	2.02	35.9	116	< .005	< .005	1.7	10.6	< .01
03-14-2011	0900	.36	2.12	81.8	142	< .005	.015	2.0	3.3	< .01
05-26-2011	1200	.07	14.1	3.7	710	< .005	.017	3.7	19.8	< .01
07-21-2011	1630	.18	.82	7.3	323	< .005	< .005	3.3	2.8	< .01

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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[%, percent; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Silver, water, unfiltered, recover-able, µg/L (01077)	Zinc, water, filtered, µg/L (01090)	Zinc, water, unfiltered, recover-able, µg/L (01092)	Arsenic, water, filtered, µg/L (01000)	Arsenic, water, unfiltered, µg/L (01002)
11-03-2010	**1430**	< .04	< 4.2	23.2	3.3	10.6
01-05-2011	**1230**	< .04	< 4.2	7.7	1.8	10.5
03-14-2011	**0900**	< .04	4.3	< 7.2	2.6	9.7
05-26-2011	**1200**	.06	1.7	40.6	3.0	7.6
07-21-2011	**1630**	< .04	8.7	12.7	5.8	9.2