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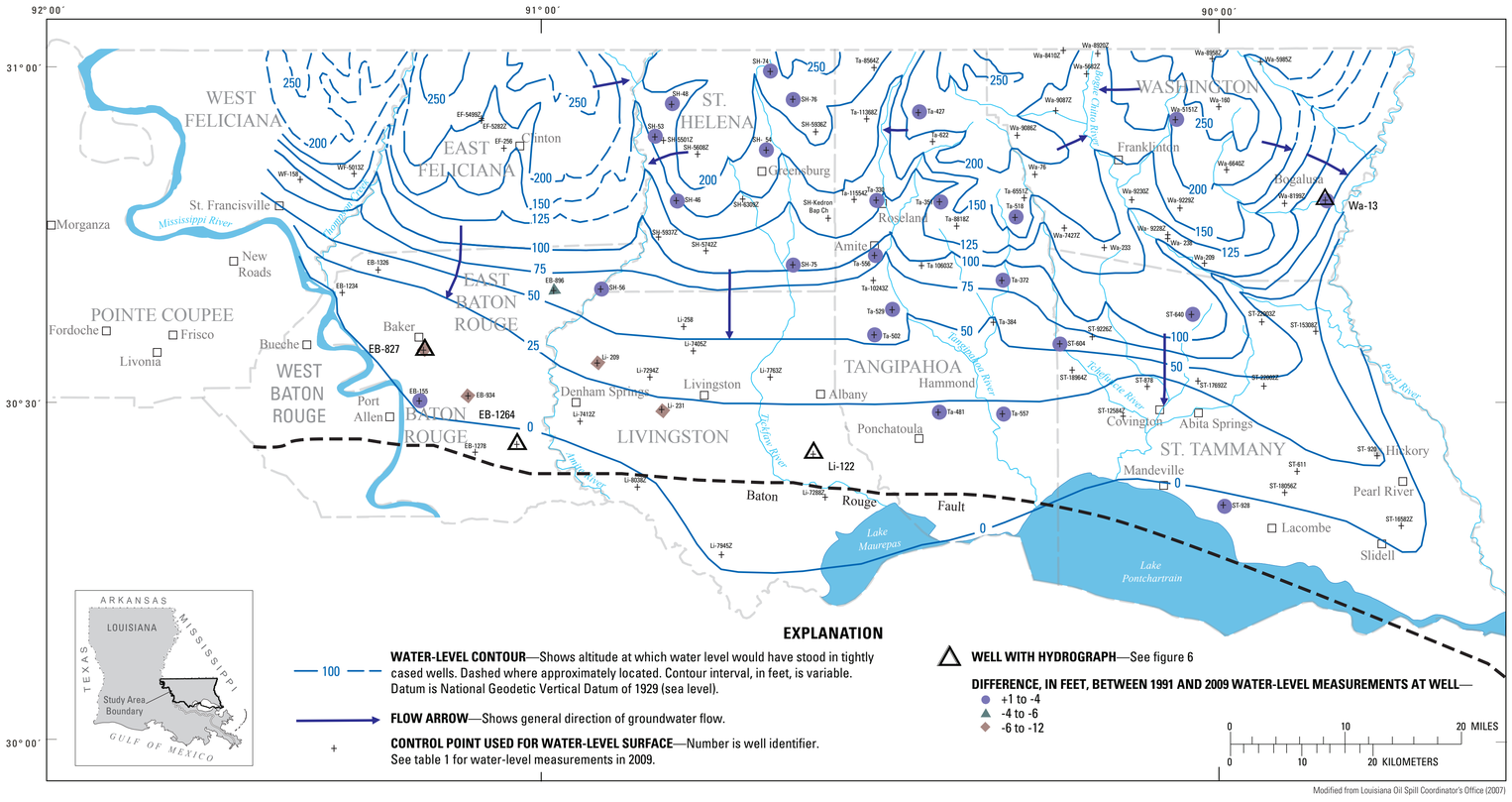
OFFICE OF PUBLIC WORKS, HURRICANE FLOOD PROTECTION AND INTERMODAL TRANSPORTATION
WATER RESOURCES PROGRAMS

SCIENTIFIC INVESTIGATIONS MAP 3173
Chicot Equivalent aquifer system—SHEET 2 OF 2

Table 1. Water-level data used to construct the water-level surface of the Chicot equivalent aquifer system in southeastern Louisiana, 2009.

[Altitudes are presented in feet above the National Geodetic Vertical Datum of 1929 (NGVD 29); water-levels are presented in feet above or below (−) NGVD 29; differences in water levels are presented in feet; --, no data]

Well name	Date measured	Altitude of land surface, in feet above NGVD 29	Water level, 2009, in feet above or below (-) NGVD 29	Water level, 1991, in feet above or below (-) NGVD 29	Difference in 1991 and 2009 water level (in feet)
East Baton Rouge Parish					
EB-155	05/19/09	60	0.98	0.62	0.36
EB-827	04/22/09	63.96	17.34	26.28	-8.94
EB-896	04/16/09	82	61.44	66.12	-4.68
EB-934	04/24/09	51	2.03	12.95	-10.92
EB-1234	04/23/09	97	1.03	--	--
EB-1264	04/16/09	38	-2.67	--	--
EB-1278	04/21/09	31	-2.28	--	--
EB-1326	06/07/09	100	33.99	--	--
East Feliciana					
EF-256	06/19/09	210	162.59	--	--
EF-5282Z	06/22/09	260	192.77	--	--
EF-5499Z	06/22/09	272	200.24	--	--
Livingston Parish					
Li-122	05/15/09	11	9.46	--	--
Li-209	05/26/09	59	30.32	37.56	-7.24
Li-231	05/28/09	37	22.07	28.14	-6.07
Li-258	05/15/09	73	53.26	--	--
Li-7288Z	05/14/09	12	4.02	--	--
Li-7294Z	05/14/09	55	32.43	--	--
Li-7405Z	05/15/09	60	46.41	--	--
Li-7412Z	05/14/09	37	12.94	--	--
Li-7763Z	05/28/09	50	38.31	--	--
Li-7945Z	06/01/09	2	0.24	--	--
Li-8038Z	06/01/09	12	-2.21	--	--
St. Helena Parish					
SH-46	05/01/09	185	149.74	153.35	-3.61
SH-48	05/26/09	245	185.77	188.51	-2.74
SH-53	05/04/09	170	154.24	155.03	-0.79
SH-54	05/01/09	235	190.75	192.55	-1.80
SH-56	05/26/09	77	67.22	70.05	-2.83
SH-74	05/05/09	270	229.59	232.72	-3.13
SH-75	05/01/09	110	102.19	103.22	-1.03
SH-76	05/01/09	250	231.39	234.22	-2.83
SH-5501Z	05/04/09	165	156.19	--	--
SH-5608Z	05/05/09	260	241.33	--	--
SH-5742Z	05/01/09	162	112.76	--	--
SH-5936Z	05/04/09	285	208.48	--	--
SH-5937Z	05/01/09	117	102.39	--	--
SH-6309Z	05/01/09	215	147.76	--	--
St. Tammany Parish					
ST-604	07/23/09	66	53.57	57.56	-3.99
ST-611	06/02/09	28	19.74	--	--
ST-640	05/27/09	155	120.75	121.28	-0.53
ST-878	06/01/09	39	20.00	--	--
ST-920	06/05/09	40	26.01	--	--
ST-928	06/02/09	17	-1.27	2.00	-3.27
ST-9226Z	06/01/09	100	75.11	--	--
ST-12584Z	06/05/09	24	12.98	--	--
ST-15308Z	06/05/09	51	46.11	--	--
ST-16582Z	06/05/09	21	6.38	--	--
ST-17692Z	06/01/09	45	29.02	--	--
ST-18056Z	06/05/09	25	4.73	--	--
ST-18964Z	06/05/09	52	40.71	--	--
ST-22002z	06/05/09	59	42.57	--	--
ST-22003z	06/01/09	95	70.26	--	--
Tangipahoa Parish					
Ta-330	04/20/09	135	125.63	127.96	-2.33
Ta-351	04/20/09	210	139.63	142.05	-2.42
Ta-372	04/21/09	162	80.32	80.49	-0.17
Ta-384	04/23/09	58	45.35	--	--
Ta-427	04/15/09	240	219.22	221.25	-2.03
Ta-481	04/23/09	26	23.29	24.08	-0.79
Ta-502	04/23/09	66	54.83	54.04	0.79
Ta-518	04/20/09	221	156.53	158.76	-2.23
Ta-529	05/26/09	77	66.22	66.23	-0.01
Ta-556	04/21/09	101	84.73	88.51	-3.78
Ta-557	05/28/09	26	21.26	21.12	0.14
Ta-622	04/15/09	208	181.19	--	--
Ta-6551Z	05/27/09	206	152.11	--	--
Ta-8564Z	04/15/09	239	221.34	--	--
Ta-8818Z	05/28/09	200	139.92	--	--
Ta-10603Z	04/21/09	158	98.42	--	--
Ta-11368Z	04/20/09	237	180.19	--	--
Ta-11554Z	05/05/09	203	140.71	--	--
Ta-10243Z	04/21/09	76	66.19	--	--
Washington Parish					
Wa-13	05/27/09	95	87.61	87.57	0.04
Wa-76	04/15/09	261	189.36	--	--
Wa-160	05/28/09	330	280.58	--	--
Wa-209	06/10/09	95	101.00	--	--
Wa-233	05/28/09	195	147.92	--	--
Wa-238	06/10/09	104	109.60	--	--
Wa-5151Z	04/28/09	260	220.32	220.97	-0.65
Wa-5682Z	05/27/09	189	169.48	--	--
Wa-5985Z	05/28/09	185	180.97	--	--
Wa-6640Z	06/01/09	269	228.61	--	--
Wa-7427Z	05/28/09	144	138.89	--	--
Wa-8199Z	06/01/09	130	111.78	--	--
Wa-8410z	05/27/09	320	233.94	--	--
Wa-8920Z	06/10/09	200	184.38	--	--
Wa-8958Z	04/28/09	337	266.19	--	--
Wa-9086Z	04/28/09	250	209.44	--	--
Wa-9087Z	04/28/09	180	177.54	--	--
Wa-9228Z	06/10/09	119	109.77	--	--
Wa-9229Z	06/10/09	188	162.31	--	--
Wa-9230Z	05/28/09	134	127.13	--	--
West Feliciana Parish					
WF-158	04/28/09	198	95.98	--	--
WF-5013Z	06/19/09	183	135.59	--	--



Modified from Louisiana Oil Spill Coordinator's Office (2007)

Figure 5. Water-level surface in the Chicot equivalent aquifer system in southeastern Louisiana, 2009.

Water-Level Surface

The 2009 water-level surface map for the Chicot equivalent aquifer system (fig. 5) was constructed from 96 water-level measurements collected April through July 2009 (table 1). The map shows the general configuration of the water-level surface (fig. 5) and includes areas where the aquifer system is unconfined (the recharge area) and areas where the system is confined by clay layers. In the recharge area, the water-level surface generally follows the topography. In the confined area, the water-level surface is smooth and less variable, and artesian conditions exist (the water level is above the top of the aquifer).

Water- level contours range from 250 ft above NGVD 29 along the northern boundary of the study area to 0 ft NGVD 29 near the southern boundary (fig. 5). In the recharge area, water-level measurements range from about 80 to 280 ft above NGVD 29. Water levels in the confined area range from about 0 ft NGVD 29 (slightly below in the Mandeville-Slidell and Baton Rouge areas) to 100 ft above NGVD 29 near outcrop areas. The highest water level, 280.58 ft above NGVD 29, was measured in the recharge area at well Wa-160 in northern Washington Parish. The lowest water level, 2.67 ft below NGVD 29, was measured in the Baton Rouge area at well EB-1264.

Movement of groundwater in the Chicot equivalent aquifer system is generally from north to south in the study area (see flow arrows on fig. 5). Groundwater movement is perpendicular to the contours in the direction of the hydraulic gradient. In the recharge area, groundwater flow is from high areas (hilltops) toward major stream valleys. Major streams that receive streamflow from groundwater include the Mississippi, Amite, Tickfaw, Tangipahoa, Tchefuncte, and Pearl Rivers, as well as Thompson Creek and Bogue Chitto. Groundwater that is not discharged into streams or withdrawn from wells moves downdip toward confined areas. Vertical movement of water in the recharge area could also recharge underlying, deeper aquifers.

Water-Level Difference, 1991–2009

Comparison of the 1991 water-level data with the 2009 data indicates water-level decline was less than 4 ft in much of the study area (table 1). The difference between 1991 and 2009 water-level measurements is shown in table 1 and figure 5. If the differences between the 1991 and 2009 measurements are representative of the decline in the water level in the shallow aquifer, the average regional water-level decline has been less than 0.25 ft per year (ft/yr) in St. Helena, Tangipahoa, St. Tammany, and Washington Parishes and parts of Livingston Parish.

The greatest difference between the 1991and 2009 water-level measurements was in Baton Rouge and the surrounding area. In East Baton Rouge Parish and in western Livingston Parish, the water-level difference generally exceeded 5 ft between the 1991 and 2009 measurements (fig. 5). In East Baton Rouge Parish, differences in water-level measurements ranged from 0.36 to -10.92 ft at four sites.

Hydrographs

Water levels at selected wells for the period 1990–2009 are shown on figure 6. Water levels fluctuated about 2 to 4 ft seasonally (each year) at sites Wa13 and Li122. Wells EB-827 and EB-1264 fluctuated 5 to 15 ft seasonally. Long-term declines for the period of record shown were about 0.5 ft/yr or slightly less at wells EB827, EB-1264, and Li122. Water levels in wells in and near the Baton Rouge area are influenced by groundwater withdrawals and changes in stage of the Mississippi River.

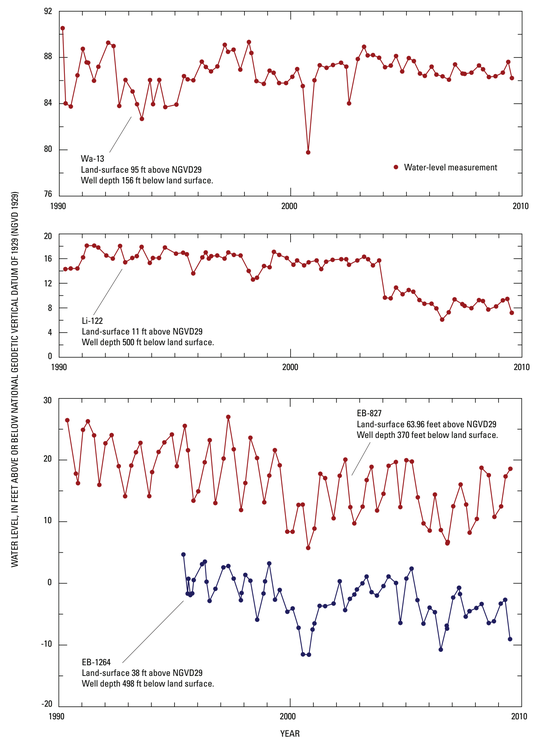


Figure 6. Water levels at selected wells, Wa-13, Li-122, EB-827, and EB-1264, screened in the Chicot equivalent aquifer system in southeastern Louisiana.

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