

# Potentiometric Surface of the Gordon Aquifer in South Carolina, November–December 2021

Revised April 2023

by  
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The Gordon aquifer is the source of water for many public, industrial, and agricultural supplies in the western to central portion of the South Carolina Coastal Plain. To help identify and assess existing or potential problems related to groundwater withdrawals from the aquifer, the South Carolina Department of Natural Resources (SCDNR) routinely measures the static (nonpumping) water level in wells open to the aquifer. Water levels are measured in numerous wells located throughout the aquifer at about the same time, and those water-level measurements are converted to potentiometric elevations and used to produce a contoured potentiometric surface map, which shows the elevation where water would stand in tightly cased wells completed in the aquifer.

This map uses the boundaries of the Paleogene-age Gordon aquifer as defined by Aadland and others (1995) and Gellici and Lautier (2010). The Gordon aquifer includes several formations that are hydraulically connected. In the updip areas (Aiken and Barnwell Counties) the Gordon is mapped at the Savannah River Site as the Steed Pond aquifer, and wells open to or screened in this aquifer are included on this map. To the east, the Gordon aquifer outcrops along the Santee River. On the map, areas where the aquifer is unconfined are indicated with brown shading.

The November–December 2021 potentiometric surface map of the Gordon aquifer was constructed using water levels from 94 wells, of which 93 are completed in the Gordon aquifer and one (BAM-22) is open to both the Middle Floridan and Gordon aquifers.

Potentiometric elevations ranged from a high of 326 ft (feet) in Aiken County to a low of -35 ft in Charleston County. No cones of depression were identified, but a potentiometric low continues to exist in southern Colleton and Charleston Counties. Only minor changes in water levels were observed compared to the 2018 map (Czwartacki and others, 2019).

Groundwater flow is generally to the southeast, towards the coast, with a few notable exceptions. In Aiken, Barnwell, and Allendale Counties, flow occurs in a southwestern direction, indicating drainage towards the Savannah River. Along much of the coast, flow is directed from all sides toward southern Charleston and Colleton Counties. Water levels are below -20 ft in most of southern Charleston County. Many wells near the coast, including wells in northern Charleston County, are experiencing saltwater intrusion.

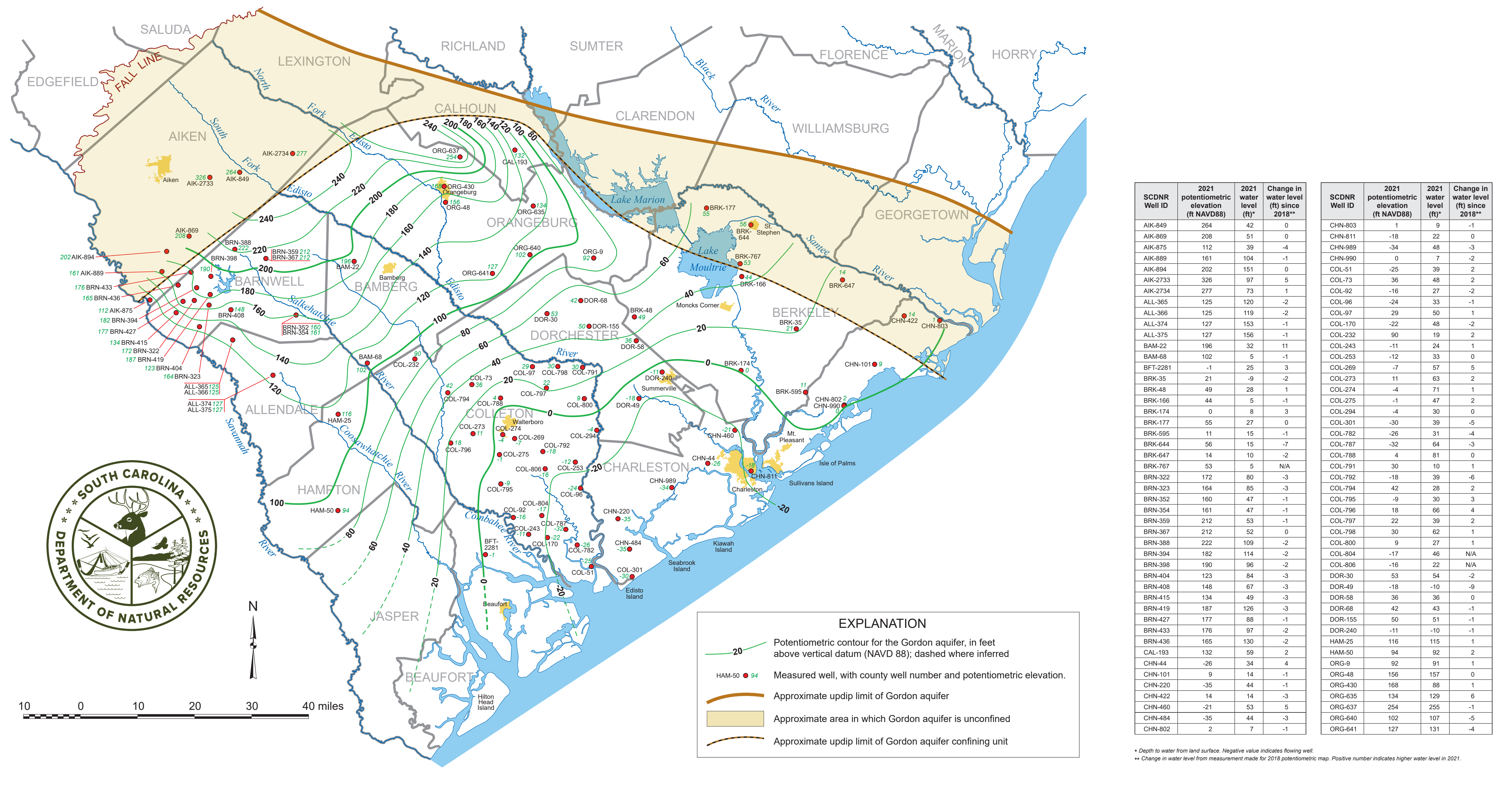
**April 2023 Revision:** After the initial release of this report, it was determined that the wrong potentiometric elevation was used for well CHN-811 in Charleston County. The map and table have been revised to use the correct potentiometric elevation of -18 feet (changed from -9 feet), and the location of the -20-foot contour line in Charleston County has been adjusted appropriately. Although it has not been revised, a similar error occurred on the previous Gordon aquifer potentiometric map (Czwartacki and others, 2019). On that map, the potentiometric elevation used for CHN-811 was approximately 9 feet too high. There has been less than one foot of change in the potentiometric elevation of the Gordon aquifer in well CHN-811 from 2018 to 2021.

## Acknowledgements

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## References

Aadland, R.K., Gellici, J.A., and Thayer, P.A., 1995, Hydrogeologic framework of west-central South Carolina: South Carolina Department of Natural Resources, Water Resources Division Report 5, 200 p.  
 Czwartacki, B., Wachob, A., and Gellici, J.A., 2019, Potentiometric surface maps of the Upper and Middle Floridan and Gordon aquifers in South Carolina, November–December 2018: South Carolina Department of Natural Resources Water Resources Report 61, 9 p.  
 Gellici, J.A., and Lautier, J.C., 2010, Hydrogeologic framework of the Atlantic Coastal Plain, North and South Carolina, in Campbell, B.G., and Coes, A.L., eds., Groundwater availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey Professional Paper 1773, p. 49–162.



SCDNR Well ID	2021 potentiometric elevation (ft NAVD88)	2021 water level (ft)*	Change in water level (ft) since 2018**	SCDNR Well ID	2021 potentiometric elevation (ft NAVD88)	2021 water level (ft)*	Change in water level (ft) since 2018**
AIK-849	264	42	0	CHN-803	1	9	-1
AIK-869	208	51	0	CHN-811	-18	22	0
AIK-875	112	39	-4	CHN-989	-34	48	-3
AIK-889	161	104	-1	CHN-990	0	7	-2
AIK-894	202	151	0	COL-51	-25	39	2
AIK-2733	326	97	5	COL-73	36	48	2
AIK-2734	277	73	1	COL-92	-16	27	-2
ALL-365	125	120	-2	COL-96	-24	33	-1
ALL-366	125	119	-2	COL-97	29	50	1
ALL-374	127	153	-1	COL-170	-22	48	-2
ALL-375	127	156	-1	COL-232	90	19	2
BAM-22	196	32	11	COL-243	-11	24	1
BAM-68	102	5	-1	COL-253	-12	33	0
BFT-2281	-1	25	3	COL-269	-7	57	5
BRK-35	21	-9	-2	COL-273	11	63	2
BRK-48	49	28	1	COL-274	-4	71	1
BRK-166	44	5	-1	COL-275	-1	47	2
BRK-174	0	8	3	COL-294	-4	30	0
BRK-177	55	27	0	COL-301	-30	39	-5
BRK-595	11	15	-1	COL-782	-26	31	-4
BRK-644	56	15	-7	COL-787	-32	64	-3
BRK-647	14	10	-2	COL-788	4	81	0
BRK-767	53	5	N/A	COL-791	30	10	1
BRN-322	172	80	-3	COL-792	-18	39	-6
BRN-323	164	85	-3	COL-794	42	28	2
BRN-352	160	47	-1	COL-795	-9	30	3
BRN-354	161	47	-1	COL-796	18	66	4
BRN-359	212	53	-1	COL-797	22	39	2
BRN-367	212	52	0	COL-798	30	62	1
BRN-388	222	109	-2	COL-800	9	27	1
BRN-394	182	114	-2	COL-804	-17	46	N/A
BRN-398	190	96	-2	COL-806	-16	22	N/A
BRN-404	123	84	-3	DOR-30	53	54	-2
BRN-408	148	67	-3	DOR-49	-18	-10	-9
BRN-415	134	49	-3	DOR-58	36	36	0
BRN-419	187	126	-3	DOR-68	42	43	-1
BRN-427	177	88	-1	DOR-155	50	51	-1
BRN-433	176	97	-2	DOR-240	-11	-10	-1
BRN-436	165	130	-2	HAM-25	116	115	1
CAL-193	132	59	2	HAM-50	94	92	2
CHN-44	-26	34	4	ORG-9	92	91	1
CHN-101	9	14	-1	ORG-48	156	157	0
CHN-220	-35	44	-1	ORG-430	168	88	1
CHN-422	14	14	-3	ORG-635	134	129	6
CHN-460	-21	53	5	ORG-637	254	255	-1
CHN-484	-35	44	-3	ORG-640	102	107	-5
CHN-802	2	7	-1	ORG-641	127	131	-4

\* Depth to water from land surface. Negative value indicates flowing well.  
 \*\* Change in water level from measurement made for 2018 potentiometric map. Positive number indicates higher water level in 2021.