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Potentiometric Surface of the Gordon Aquifer in South Carolina, November–December 2024

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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 Environmental Services (SCDES) routinely measures the static (nonpumping) water level in wells open to the aquifers. 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 2024 potentiometric surface map of the Gordon aquifer was constructed using water levels from 74 wells, all of which are completed in the Gordon aquifer. Water level measurements were collected by SCDES and the Savannah River National Laboratory. The authors are grateful for the participation of these cooperating agencies and for the cooperation of the many well owners who provided the access to their wells needed to obtain the water level measurements used for these maps.

Only minor changes in water levels were observed compared to the 2021 map (Czwartacki and Wachob, 2022). Potentiometric elevations ranged from a high of 324 ft (feet) in Aiken County to a low of -39 ft in Charleston County. Although a small cone of depression has developed in northern Dorchester County, the most significant feature of the map is the potentiometric low that exists throughout southern Colleton and Charleston Counties. Water levels are below -20 ft in most of southern Charleston County.

Groundwater flow is generally to the southeast, toward 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. Many wells near the coast, including wells in Charleston and Colleton Counties, are experiencing saltwater intrusion.

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.

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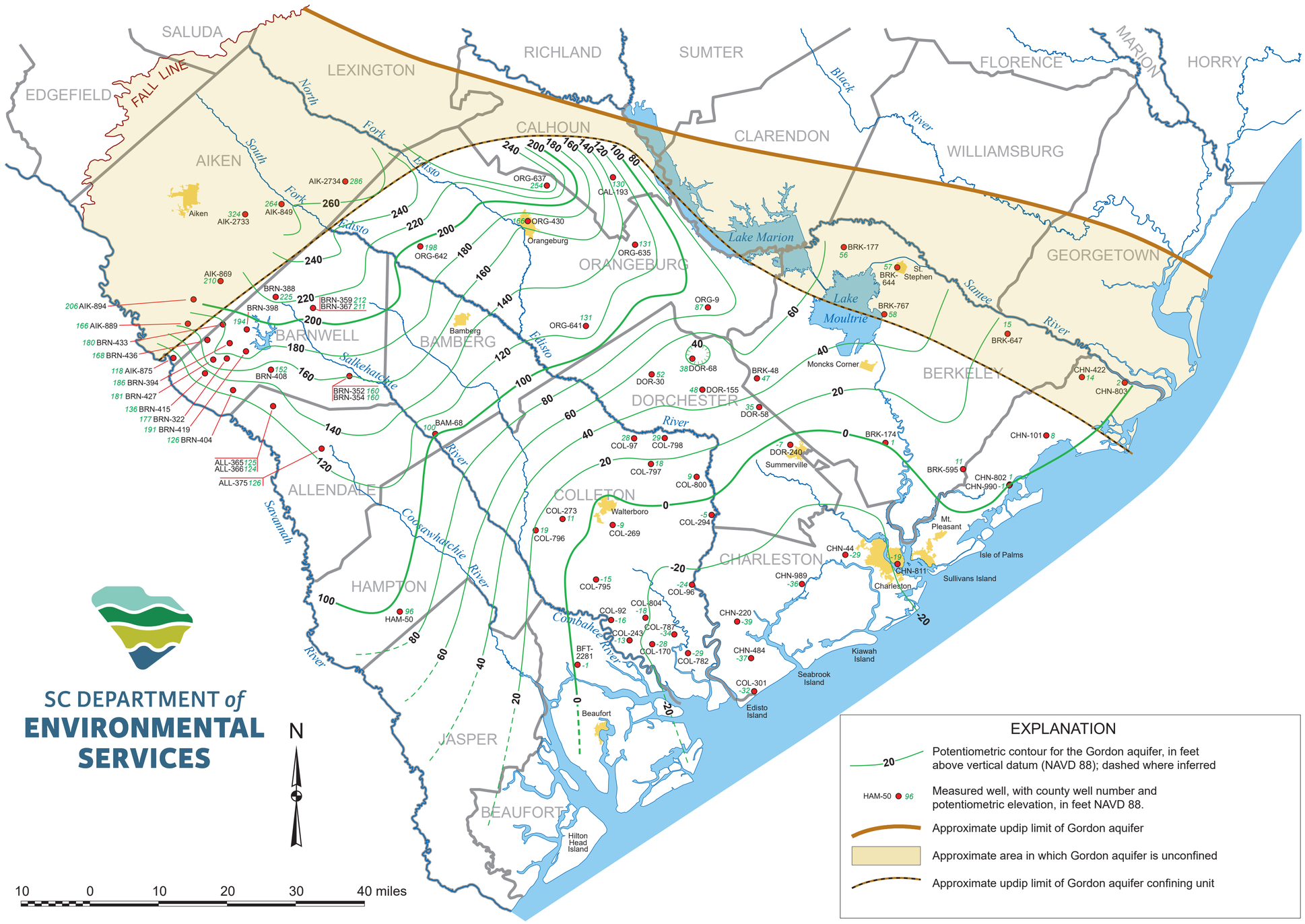
Gellici, J.A., and Lautier, J.C., 2010, Hydrogeologic framework of the Atlantic Coastal Plain, North and South Carolina, *in* Campbell, B.G., and Coes, A.L., eds., Groundwater availability in the Atlantic Coastal Plain of North and South Carolina: U.S. Geological Survey Professional Paper 1773, p. 49–162.



Well ID	2024 potentiometric elevation (ft NAVD88)	2024 water level (ft)*	Change in water level (ft) since 2021**
AIK-849	264	42	0
AIK-869	210	50	2
AIK-875	118	34	5
AIK-889	166	101	3
AIK-894	206	149	3
AIK-2733	324	100	-3
AIK-2734	286	64	9
ALL-365	125	120	0
ALL-366	124	119	-1
ALL-375	126	156	-2
BAM-68	100	7	-2
BFT-2281	-1	25	0
BRK-48	47	30	-2
BRK-174	-1	9	-2
BRK-177	56	26	1
BRK-595	11	15	0
BRK-644	57	14	1
BRK-647	15	9	1
BRK-767	58	1	4
BRN-322	177	76	4
BRN-352	160	46	0
BRN-354	160	47	-1
BRN-359	212	52	1
BRN-367	211	53	-1
BRN-388	225	107	2
BRN-394	186	112	3
BRN-398	194	93	2
BRN-404	126	82	2
BRN-408	152	64	3
BRN-415	136	45	4
BRN-419	191	122	3
BRN-427	181	85	3
BRN-433	180	94	3
BRN-436	168	128	2
CAL-193	130	61	-2
CHN-44	-29	37	-4
CHN-101	8	14	0
CHN-220	-39	48	-4
CHN-422	14	14	0
CHN-484	-37	47	-2
CHN-802	1	7	-1
CHN-803	2	8	1
CHN-811	-19	24	-1
CHN-989	-36	51	-2
CHN-990	-1	7	0
COL-92	-16	27	0
COL-96	-28	37	-3
COL-97	28	52	-2
COL-170	-23	49	-1
COL-243	-13	26	-2
COL-269	-9	59	-2
COL-273	11	63	0
COL-294	-5	31	-1
COL-301	-32	41	-2
COL-782	-29	33	-3
COL-787	-34	66	-2
COL-795	-15	36	-6
COL-796	19	64	1
COL-797	18	44	-5
COL-798	29	63	-2
COL-800	9	27	-1
COL-804	-18	48	-1
DOR-30	52	34	-1
DOR-58	35	35	-1
DOR-68	38	49	-3
DOR-155	48	56	-2
DOR-240	-7	77	4
HAM-50	96	18	2
ORG-9	87	15	-5
ORG-430	166	90	-2
ORG-635	131	28	-3
ORG-637	254	79	0
ORG-641	131	6	4
ORG-642	198	25	n/a

** Depth to water from land surface. Negative value indicates flowing well.*

*** Change in water level from measurement made for 2021 potentiometric map. Positive number indicates higher water level in 2024.*