Map No. 1

HYDROGEOLOGY of the WESTERN ANNAPOLIS VALLEY, NOVA SCOTIA

DEPARTMENT OF MINES, NOVA SCOTIA

1969

Scale: One Inch to One Mile = 1/63,360

1 0 1 2 3 4 5

Scale in Miles

LEGEND

CENOZOIC

QUATERNARY
RECENT

- Salt marsh and tidal flat
- Dykeland
- Stream alluvium
- Peat and muck

PLEISTOCENE
Ice-contact stratified drift

- Kames, kame complex
- Esker
- Estuarine silt and clay
- Till

MESOZOIC

TRIASSIC

- 6 — NORTH MOUNTAIN BASALT : basalt
- 5 — BLOMIDON FORMATION : siltstone, arenaceous shale, minor sandstone and claystone.
- 4 — WOLFVILLE FORMATION : sandstone, conglomerate, siltstone and claystone.

PALAEOZOIC

MISSISSIPPIAN

- 3 — HORTON GROUP
  Siltstone, sandstone and arkose (present only at the eastern end of the Annapolis-Cornwallis Valley)

DEVONIAN

- 2 — SOUTHERN NOVA SCOTIA BATHOLITH : porphyritic granite.

LOWER PALAEOZOIC

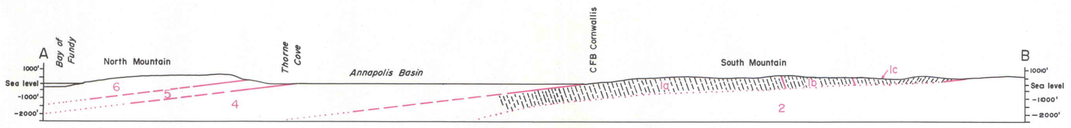
- 1 — Ic, TORBROOK FORMATION (LOWER DEVONIAN)
  Ib, {NEW CANAAN FORMATION (UPPER SILURIAN) / KENTVILLE FORMATION (UPPER SILURIAN) / WHITE ROCK FORMATION (UPPER SILURIAN or earlier)}
  Ia, {HALIFAX FORMATION (ORDOVICIAN) / GOLDENVILLE FORMATION (ORDOVICIAN or earlier)}
  — Mainly slate and quartzite

Bedrock boundary (approximate, assumed)
Surficial deposit boundary (approximate)
Fault (approximate, assumed)
Strike and dip of bedding
Measured section
Raised beach
Raised estuarine deposits
Outcrop used to locate bedrock boundary
Test hole location and number
Water well (drilled, flowing artesian, dug) and index number
Spring and index number
Roads
Trail
County line
Stream
Lake
Marsh or swamp
Building
Dyke
Railways
Contour, interval 50 feet

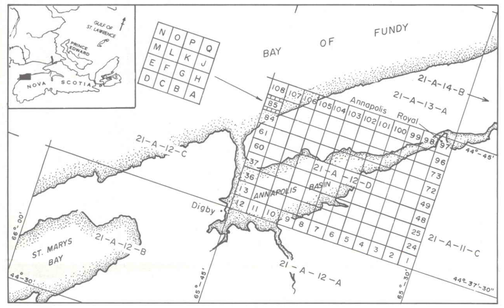
Bedrock geology on South Mountain is taken from a map by F.C. Taylor (1962). Triassic boundaries have been plotted from field work and air photo interpretation by P.C. Trescott, 1968.

Surficial geology was mapped by P.C. Trescott, 1968, with reference made to soil maps of Digby County (J.D. Hilchey, D.B. Cann, and J.I. Mac Dougall 1962) and Annapolis County (in press).

Base map compiled by the Cartographic Division, Nova Scotia Department of Mines from topographic maps on a scale of 1:50,000 of the National Topographic Series obtained from the Department of Energy, Mines and Resources, Ottawa.



Section along line A-B



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Depth (feet)*		95	140	244	100		161	170		112		90				100		156	216	203	305		358		433	400	110					125	150	68		78		194	90	175	98	120	167	63	60	55	39	190	180		62	150	175	200		190
Water level (feet)*	3	14	28	14	2	3	80	105	3	8	5	20	2		2	17	2	82	105	78	114	3	120	4	23	19	29	3	3	2	6	20	17	6	11	10	6	0	11	45	28	10	0	12	30	8	4	42	19	3	10	40	16	19	5	15
Chemical Analysis					X		X	X		X				X		X									X	X	X					X					X				X				X												

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Depth (feet)*	350	86	200	115		80	228	170	105		155		136	200	122		120		147	40	250		98	145		130	107	105					90	120			93	125	20	214	110							93				168			
Water level (feet)*	30	15		4	5		80	63	20	39		6		21	20	6	30	4	21	11	69	8	8	24	15	6	28	4		25	3	5	15	22	5	5	60	6	6	100	24	12	5	12	2	11	16	10	29	5	146	5	4		
Chemical Analysis				X										X					X						X								X					X	X	X																

* measurements for drilled wells have been taken from drillers' reports; dug wells were measured during the early summer of 1968.

NOTES ON THE POTENTIAL FOR GROUNDWATER SUPPLIES

The following outline is a summary of information in Report 69-1. In general the quality of groundwater is good to excellent except where noted. Drilled wells constructed near the sea in any geologic unit may yield water deteriorating in quality with time due to salt water intrusion; such wells may yield brackish water from the start where the surrounding land has low relief. Yields are given in imperial gallons per minute (gpm).

INDIVIDUAL WELLS MAY YIELD FROM 5 TO 200+ GPM
(Wolfville Formation and Ice-contact Stratified Drift)

Wells several hundred feet deep in the Wolfville Formation should penetrate enough water-bearing sandstone and conglomerate beds (except along the flank of South Mountain where the formation wedges out) to produce at least 100 gpm. High capacity wells in this formation may have to be screened to prevent the pumping of sand.

Screened wells in stratified drift may produce several hundred gpm where the aquifer is of sufficient thickness and extent (e.g. along and adjacent to the Allain River at Lequille). The long term yield from more restricted aquifers (e.g. kame deposits at Seaview, Clementsport, and Clementsvale) will probably be less than 100 gpm. Most of the other stratified drift deposits are small and can be expected to yield little more than a domestic supply (1-3 gpm) to wells.

INDIVIDUAL WELLS MAY YIELD FROM 2 TO 40 GPM
(Blomidon Formation, North Mountain Basalt, and South Mountain Granite)

Wells in the Blomidon Formation derive their water primarily from thin sandstone lenses and beds, and secondarily from fracture permeability. In general, only wells penetrating sandstone beds with a total thickness of several tens of feet will yield up to 40 gpm. It is possible that a few wells in this formation will penetrate gypsum lenses which will make the water excessively hard.

Permeability in the North Mountain Basalt and in the South Mountain Granite is concentrated along fractures which tend to parallel the surface. Although a few "dry" holes are known, domestic supplies can usually be obtained; in places wells will penetrate sufficient water-bearing fractures to yield up to 40 gpm.

INDIVIDUAL WELLS MAY YIELD FROM 1 TO 10 GPM
(Lower Palaeozoic Metamorphic Rocks, Glacial Till, and Stream Alluvium)

The fracture permeability in metamorphic rocks commonly will yield no more than a domestic supply to wells; a few wells can be classed as failures. In places water from such rocks will contain excessive quantities of iron and sometimes manganese.

Glacial till and stream alluvium usually will yield only a domestic supply to dug wells. The one exception is at Clementsport where the Moose River alluvium, which is composed of sand and gravel, may be thick enough to yield several tens to a hundred or more gpm to screened wells.

SURFICIAL DEPOSITS WHICH NORMALLY DO NOT CONTAIN USEABLE GROUNDWATER SUPPLIES
(Salt Marsh and Tidal Flat, Dykeland, Peat and Muck, Estuarine silt and Clay)

BAY OF FUNDY
ANNAPOLIS BASIN
ST MARY'S BAY
DIGBY NECK
DIGBY GUT
ANNAPOLIS RIVER
Annapolis Co.
Digby Co.
Digby
Cornwallis
Clementsport
Bear River
Lequille
Granville
Port Royal
Deep Cove
Thorne Cove
Lighthouse Point
Parker Cove
Blyndon
Bloomfield
Hillsdale
Smith Cove
Bear River East
Virginia Lake
Princedale
Lake Le Rose
Lake La Rose
Jerry L.
Lamb L.
Crescent Lake
GRAND LAKE
Gaspereau
Gaspereau River
Allain
Atlantic
Dominion
Atlantic
Hillsdale
Bear River
Clementsport
Port Royal
Granville
Lequille
Digby
Bear River
Bear River East
Smith Cove
Deep Cove
Thorne Cove
Lighthouse Point
Parker Cove
Port Royal
Goat I.
Clementsport
Bear River
Bear River East
Virginia Lake
Princedale
Lake Le Rose
Lake La Rose
Jerry L.
Lamb L.
Crescent Lake