

U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science Directorate
Geologic Resources Division



Weir Farm National Historical Park

GRI Ancillary Map Information Document

Produced to accompany the Geologic Resources Inventory (GRI) Digital Geologic Data for Weir Farm National Historical Park

wefa_geology.pdf

Version: 9/1/2021

Geologic Resources Inventory Map Document for Weir Farm National Historical Park

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Geologic Resources Inventory Map Document



Weir Farm National Historical Park, Connecticut

Document to Accompany Digital Geologic-GIS Data

[wefa_geology.pdf](#)

Version: 9/1/2021

This document has been developed to accompany the digital geologic-GIS data developed by the Geologic Resources Inventory (GRI) program for Weir Farm National Historical Park, Connecticut (WEFA).

Attempts have been made to reproduce all aspects of the original source products, including the geologic units and their descriptions, geologic cross sections, the geologic report, references and all other pertinent images and information contained in the original publication.

This document contains the following information:

- 1) **About the NPS Geologic Resources Inventory Program** – A brief summary of the Geologic Resources Inventory (GRI) Program and its products. Included are web links to the GRI GIS data model, and to the GRI products page where digital geologic-GIS datasets, scoping reports and geology reports are available for download. In addition, web links to the NPS Data Store and GRI program home page, as well as contact information for the GRI coordinator, are also present.
- 2) **GRI Digital Maps and Source Citations** – A listing of all GRI digital geologic-GIS maps produced for this project along with sources used in their completion. In addition, a brief explanation of how each source map was used is provided.
- 3) **Bedrock Geologic-GIS Map of Weir Farm National Historical Park and Vicinity**
 - 3a) **Bedrock Map Unit List** – A listing of all bedrock geologic map units present on the bedrock map.
 - 3b) **Bedrock Map Unit Descriptions** – Descriptions for all bedrock geologic map units.
 - 3c) **Geologic Cross Sections** – Geologic cross section graphic.
 - 3d) **Ancillary Source Map Information** – Additional bedrock source map information presented by source map.
- 4) **Surficial Geologic-GIS Map of Weir Farm National Historical Park and Vicinity**
 - 4a) **Surficial Map Unit List** – A listing of all surficial geologic map units present on the surficial

map.

4b) **Surficial Map Unit Descriptions** – Descriptions for all surficial geologic map units.

4c) **Ancillary Source Map Information** – Additional surficial source map information presented by source map.

5) **GRI Digital Data Credits** – GRI digital geologic-GIS data and ancillary map information document production credits.

For information about using GRI digital geologic-GIS data contact:

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About the NPS Geologic Resources Inventory Program

Background

The Geologic Resources Inventory (GRI) provides geologic map data and pertinent geologic information to support resource management and science-informed decision making in more than 270 natural resource parks throughout the National Park System. Geologic resources for management consideration include both the processes that act upon the Earth and the features formed as a result of these processes. Geologic processes include: erosion and sedimentation; seismic, volcanic, and geothermal activity; glaciation, rockfalls, landslides, and shoreline change. Geologic features include mountains, canyons, natural arches and bridges, minerals, rocks, fossils, cave and karst systems, beaches, dunes, glaciers, volcanoes, and faults.

The GRI is one of 12 inventories funded by the National Park Service (NPS) Inventory and Monitoring Program. The Geologic Resources Division of the NPS Natural Resource Stewardship and Science Directorate administers the GRI. The NPS Geologic Resources Division partners with the Colorado State University Department of Geosciences to produce GRI products. Many additional partners participate in the GRI process by contributing source maps or reviewing products.

The GRI team undertakes three tasks for each park in the Inventory and Monitoring program: (1) conduct a scoping meeting and provide a summary document, (2) provide digital geologic map data in a geographic information system (GIS) format, and (3) provide a GRI report. These products are designed and written for nongeoscientists.

Products

Scoping Meetings: These park-specific meetings bring together local geologic experts and park staff to inventory and review available geologic data and discuss geologic resource management issues. A summary document is prepared for each meeting that identifies a plan to provide digital map data for the park.

Digital Geologic Maps: Digital geologic maps reproduce all aspects of traditional paper maps, including notes, legend, and cross sections. Bedrock, surficial, and special purpose maps such as coastal or geologic hazard maps may be used by the GRI to create digital Geographic Information Systems (GIS) data and meet park needs. These digital GIS data allow geologic information to be easily viewed and analyzed in conjunction with a wide range of other resource management information data.

For detailed information regarding GIS parameters such as data attribute field definitions, attribute field codes, value definitions, and rules that govern relationships found in the data, refer to the NPS Geology-GIS Data Model document available at: <https://www.nps.gov/articles/gri-geodatabase-model.htm>

Geologic Reports: GRI reports synthesize discussions from the original scoping meeting, follow up conference call(s), and subsequent research. Chapters of each report discuss the geologic setting of the park, distinctive geologic features and processes within the park, highlight geologic issues facing resource managers, and describe the geologic history leading to the present-day landscape. Each report also includes a poster illustrating these GRI digital geologic-GIS data.

For a complete listing of GRI products visit the GRI publications webpage: <https://go.nps.gov/gripubs>. GRI digital geologic-GIS data is also available online at the NPS Data Store: <https://irma.nps.gov/DataStore/Search/Quick>. To find GRI data for a specific park or parks select the appropriate park(s), enter "GRI" as a Search Text term, and then select the Search button.

For more information about the Geologic Resources Inventory Program visit the GRI webpage: <https://>

www.nps.gov/subjects/geology/gri.htm. At the bottom of that webpage is a “Contact Us” link if you need additional information. You may also directly contact the program coordinator:

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The Geologic Resources Inventory (GRI) program is funded by the National Park Service (NPS) Inventory and Monitoring (I&M) Division. Learn more about I&M and the 12 baseline inventories at the I&M webpage: <https://www.nps.gov/im/inventories.htm>.

GRI Digital Maps and Source Map Citations

The GRI digital geologic-GIS maps for Weir Farm National Historical Park, Connecticut (WEFA):

Digital Bedrock Geologic-GIS Map of Weir Farm National Historical Park and Vicinity, Connecticut (*GRI MapCode WEFA_bedrock*)

The map was produced from the following source maps.

Kroll, R.L., 1969, Bedrock Geology of the Norwalk North Quadrangle, Connecticut: Connecticut Geological and Natural History Survey, Quadrangle Report 34, plate 1, scale 1:24,000 ([Norwalk North Quadrangle \(Bedrock\)](#)). (*GRI Source Map ID 55025*).

Rodgers, John, 1985, Bedrock Geological Map of Connecticut: Connecticut Geological and Natural History Survey, Connecticut Natural Resources Atlas Series , 2 Sheets, scale 1:125,000 ([Bedrock Geological Map of Connecticut](#)). (*GRI Source Map ID 2299*).

The full extent of the Norwalk North quadrangle map (Kroll, 1965) only the northern third of the source map was used, however, all geologic features within this extent were captured. For the Bedrock Geological Map of Connecticut map (Rodgers, 1965), only a portion of the source map, the extent of the Bethel quadrangle, was used, however, all geologic features within this extent were captured.

Digital Surficial Geologic-GIS Map of Weir Farm National Historical Park and Vicinity, Connecticut (*GRI MapCode WEFA_surficial*)

The map was produced from the following source maps.

London, E.H., 1984, Surficial Geologic Map of the Bethel Quadrangle, Connecticut: U.S. Geological Survey, Miscellaneous Field Studies Map MF-1519, scale 1:24,000 ([Bethel Quadrangle \(Surficial\)](#)). (*GRI Source Map ID 2954*).

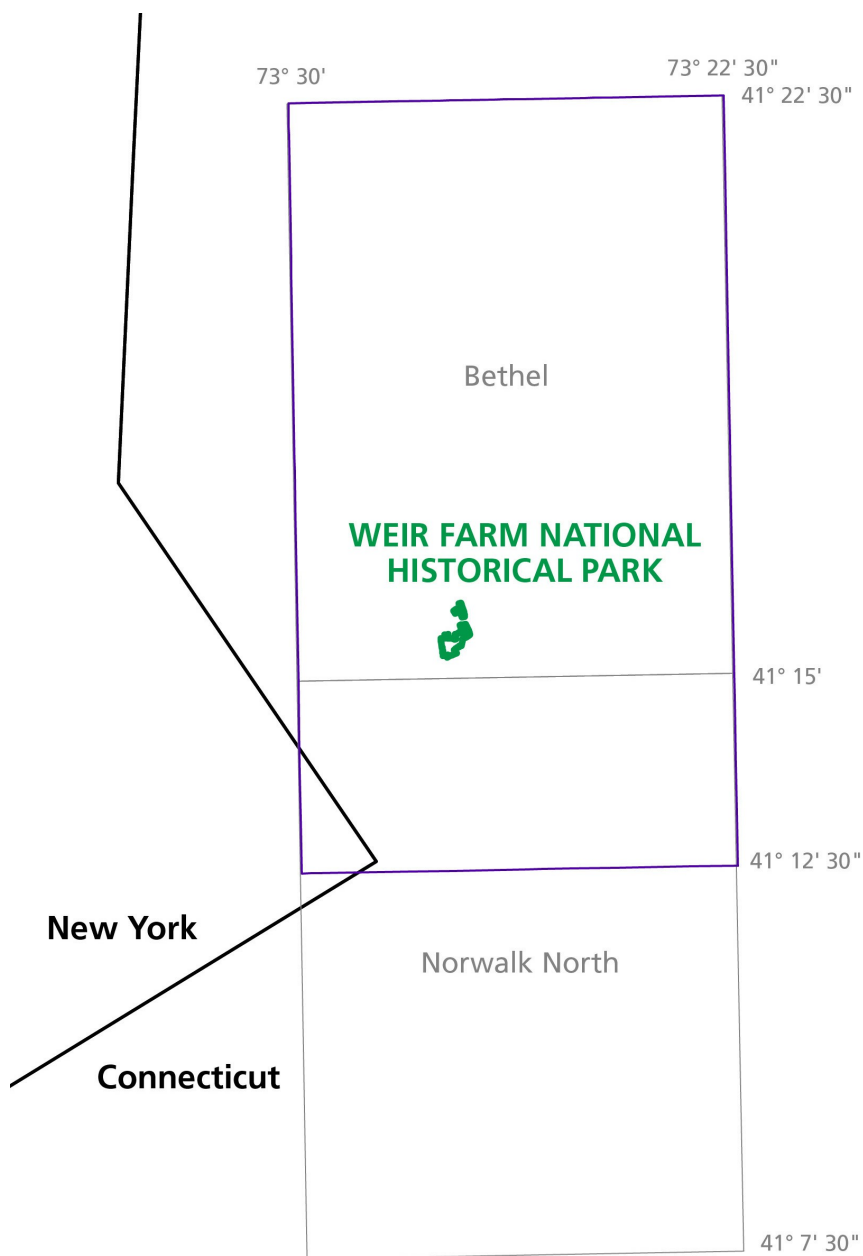
London, E.H., 1984, Surficial Geologic Map of the Norwalk North Quadrangle, Connecticut: U.S. Geological Survey, Miscellaneous Field Studies Map MF-1520, scale 1:24,000 ([Norwalk North Quadrangle \(Surficial\)](#)). (*GRI Source Map ID 2953*).

The full extent of Bethel quadrangle (London, 1984) was used and all geologic features within this extent were captured. For the Norwalk North quadrangle, only the northern third of the source map (London, 1984b) was used, however, all geologic features within this extent were captured.

Additional information pertaining to each source map is also presented in the GRI Source Map Information (WEFAMAP) table included with the GRI digital geologic-GIS data.

Index Map

The following index map displays the shared extent (in purple) of the GRI bedrock digital geologic-GIS map, and the surficial digital geologic-GIS map for Weir Farm National Historical Park (WEFA). The boundary for Weir Farm National Historical Park (as of August, 2021) is outlined in green. The extent of the Bethel and Norwalk North 7.5' quadrangles are also displayed (in gray), as are the latitude and longitude coordinates associated with the quadrangles, as well as the southern latitude of the GRI digital geologic-GIS data. The state boundary between Connecticut and New York state is also displayed.



Index map by Kajsa Holland-Goon, Lucas Chappell and Stephanie O'Meara (Colorado State University).

Bedrock Geologic-GIS Map of Weir Farm National Historical Park and Vicinity

Bedrock Map Unit List

The geologic units present in the digital bedrock geologic-GIS data produced for Weir Farm National Historical Park, Connecticut (WEFA) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Dp - Pegmatite). Units are listed from youngest to oldest. No description for water is provided. Information about each (bedrock) geologic unit is also presented in the GRI Geologic Unit Information (WEFAUNIT_bedrock) table included with the GRI bedrock geologic-GIS data.

Paleozoic Era

Devonian Period

[Dp](#) - Pegmatite

[Dh](#) - Hornblendite

[Dgog](#) - Granodiorite gneiss

Ordovician Period

[Og](#) - Ordovician? granitic gneiss, undivided

[Ogmsg](#) - Ordovician? granitic gneiss, massive felsic gneiss

[Ogpg](#) - Ordovician? granitic gneiss, porphyroblastic gneiss

[Ogmxxg](#) - Ordovician? granitic gneiss, mixed felsic gneiss

[Ob](#) - Brookfield Gneiss

[Ow](#) - Walloomsac Schist

[Owm](#) - Basal marble member of Walloomsac Schist

[Oh](#) - Harrison Gneiss, undivided

[Ohp](#) - Pumpkin Ground Member of Harrison Gneiss

[Ohpz](#) - Harrison Gneiss, pillow zone

[Ohgg](#) - Harrison Gneiss, garnet-gedrite rock

[Or](#) - Ratlum Mountain Schist, undivided

[Ora](#) - Amphibolite unit in Ratlum Mountain Schist

[Orcs](#) - Ratlum Mountain Schist, calc-silicate gneiss

[Orct](#) - Ratlum Mountain Schist, cotecule-bearing granulite interlayers

[Oru](#) - Ratlum Mountain Schist, uncertain stratigraphic position

Ordovician and Cambrian Periods

[OCr](#) - Rowe Schist

[OCs](#) - Stockbridge Marble

Cambrian Period

[Cm](#) - Manhattan Schist

[Cd](#) - Dalton Formation

Precambrian Era

[Yg](#) - Gneiss of Highlands massifs

Bedrock Map Unit Descriptions

Descriptions of all bedrock geologic map units, listed from youngest to oldest, are presented below.

Dp - Pegmatite (Devonian?)

Unfoliated, coarse- and very coarse-grained rock, composed of quartz, microcline, oligoclase, biotite, muscovite, and, locally, black tourmaline. In the mafic gneisses, pegmatites are composed of oligoclase and quartz. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Dh - Hornblendite (Devonian?)

Medium- to coarse-grained, poorly foliated, dark rock, composed mostly of hornblende with biotite, chlorite, apatite, sphene, and opaques. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Dgog - Granodiorite gneiss (Devonian?)

Medium- to coarse-grained, poorly foliated, pink rock composed of plagioclase, quartz, microcline, muscovite, and biotite, with accessory zircon, apatite, opaques, and chlorite. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Og - Ordovician? granitic gneiss, undivided (Middle Ordovician?)

White, light-gray, buff, or pink, generally foliated granitic gneiss, composed of sodic plagioclase, quartz, microcline, muscovite, and biotite, and locally garnet or sillimanite. Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

Ogmsg - Ordovician? granitic gneiss, massive felsic gneiss (Middle Ordovician? (Devonian? (Kroll, 1969)))

msg - Massive felsic gneiss (Devonian? (Kroll, 1969)) - Medium- to coarse-grained, poorly foliated, gray-to-buff gneiss, composed of plagioclase, quartz, microcline, muscovite, and biotite, with accessory opaques, chlorite, apatite, garnet, zircon, and sillimanite. See description of Ordovician? granitic gneiss ([Og](#)) for more information. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Unit is recognized to be Middle Ordovician? in age based on a corresponding unit with the [Bedrock Geological Map of Connecticut](#).

Ogpg - Ordovician? granitic gneiss, porphyroblastic gneiss (Middle Ordovician? (Devonian? (Kroll, 1969)))

pg - Porphyroblastic gneiss (Devonian? (Kroll, 1969)) - Medium- to coarse-grained, foliated, gray-to-buff gneiss, composed of plagioclase, quartz, microcline, muscovite, and biotite, with accessory garnet, opaques, apatite, zircon, chlorite, and rare calcite. Microcline porphyroblasts are 1-3 cm long. See description of Ordovician? granitic gneiss ([Og](#)) for more information. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Unit is recognized to be Middle Ordovician? in age based on a corresponding unit with the [Bedrock Geological Map of Connecticut](#).

Ogmxxg - Ordovician? granitic gneiss, mixed felsic gneiss (Middle Ordovician? (Cambrian and Ordovician (Kroll, 1969)))

mxg - Mixed felsic gneiss (Cambrian and Ordovician (Kroll, 1969)) - Medium- to coarse-grained, poorly- to well-foliated, gray-to-buff gneiss, composed of plagioclase, quartz, microcline, muscovite, and biotite, with accessory opaques, chlorite, apatite, garnet, and zircon. Subordinate rock types within the area mapped as mixed felsic gneiss are listed in order of approximate abundance; stratigraphic position is not inferred. See description of Ordovician? granitic gneiss ([Og](#)) for more information. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Unit is recognized to be Middle Ordovician? in age based on a corresponding unit with the [Bedrock Geological Map of Connecticut](#).

Ob - Brookfield Gneiss (Middle? Ordovician)

Gneiss (dioritic and granodioritic) - Dark and light, commonly speckled or banded, medium- to coarse-grained, massive to poorly foliated gneiss, composed of plagioclase, biotite, and hornblende, generally with quartz and K-feldspar, the latter commonly as megacrysts 1 to 3 cm across (also plagioclase megacrysts in darker rocks), locally associated with amphibolite or hornblende schist. Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

Ow - Walloomsac Schist (Middle Ordovician)

Black to dark-or silvery-gray, rarely layered schist or phyllite, composed of quartz, albite, and commonly garnet and staurolite or sillimanite (locally strongly retrograded to chlorite and muscovite). Locally feldspathic or calcareous near the base. Part of the following terrane: Proto-North American (Continental) Terrane / Ordovician and Cambrian Shelf Sequence. Description from source map: [Bedrock Geological Map of Connecticut](#)

Owm - Basal marble member of Walloomsac Schist (Middle Ordovician)

Dark-gray to white, massive to layered schistose or phyllitic calcite-phlogopite marble. Part of the following terrane: Proto-North American (Continental) Terrane / Ordovician and Cambrian Shelf Sequence. Description from source map: [Bedrock Geological Map of Connecticut](#)

Oh - Harrison Gneiss, undivided (Middle? Ordovician)**Oh - Harrison Gneiss (Middle? Ordovician)**

Interlayered dark- and light-gray, medium-grained, well-foliated gneiss, composed of andesine, quartz, hornblende, and biotite (also locally K-feldspar as megacrysts 1 to 5 cm long). Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

Consists of three units on the Norwalk North quadrangle source map.

mgII - Mafic gneiss (Cambrian and Ordovician (Kroll, 1969))

Similar to mgl.

mgl - Mafic gneiss (Cambrian and Ordovician (Kroll, 1969))

Medium- to coarse-grained, moderately- to well-foliated, gray-to-black gneiss, locally with fine cross-laminations, composed of plagioclase, quartz, microcline, biotite, hornblende, and local pyroxene, with accessory sphene, apatite, zircon, allanite, opaques, chlorite, and rare calcite.

mg0 - Mafic gneiss (Cambrian and Ordovician (Kroll, 1969))

Similar to mgl, but stratigraphic position uncertain.

Descriptions from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Ohp - Pumpkin Ground Member of Harrison Gneiss (Middle Ordovician? (Cambrian and Ordovician (Kroll, 1969)))**Ohp - Pumpkin Ground Member of Harrison (Middle Ordovician?)**

Medium- to light-gray, medium- to coarse-grained, well-layered and foliated gneiss, composed of oligoclase, microcline, quartz, and biotite; some layers have numerous microcline megacrysts 1 to 5 cm across; others have hornblende; minor layers of garnetiferous schist and gneiss. Description from source map: [Bedrock Geological Map of Connecticut](#)

mgII - Mafic gneiss (Cambrian and Ordovician (Kroll, 1969))

Porphyroblastic, medium- to coarse-grained, moderately- to well-foliated, gray-to-black gneiss, composed of plagioclase, quartz, microcline, biotite, hornblende, and local pyroxene, with accessory sphene, apatite, zircon, allanite, opaques, and chlorite. Carlsbad-twinned microcline porphyroblasts locally constitute 10 percent of the rock. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Ohpz - Harrison Gneiss, pillow zone (Middle Ordovician? (Cambrian and Ordovician (Kroll, 1969)))**mgl - Mafic gneiss. (Cambrian and Ordovician (Kroll, 1969))**

Medium- to coarse-grained, moderately- to well-foliated, gray-to-black gneiss, locally with fine cross-laminations, composed of plagioclase, quartz, microcline, biotite, hornblende, and local pyroxene, with accessory sphene, apatite, zircon, allanite, opaques, chlorite, and rare calcite. Includes:

pz - Pillow zone - almost unfoliated, granular pods, 4 cm to 1 m in diameter, composed mostly of pyroxene, plagioclase, hornblende, and clinozoisite.

Descriptions from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

See description of Harrison Gneiss ([Oh](#)) for more information.

Ohgg - Harrison Gneiss, garnet-gedrite rock (Middle Ordovician? (Cambrian and Ordovician (Kroll, 1969)))

mgl - Mafic gneiss. (Cambrian and Ordovician (Kroll, 1969))

Medium- to coarse-grained, moderately- to well-foliated, gray-to-black gneiss, locally with fine cross-laminations, composed of plagioclase, quartz, microcline, biotite, hornblende, and local pyroxene, with accessory sphene, apatite, zircon, allanite, opaques, chlorite, and rare calcite. Includes:

gg - Garnet-gedrite rock - poorly- to well-foliated, very coarse, brown-to-silvery schist, composed of garnet, gedrite, biotite, and sillimanite with local staurolite, cordierite, chlorite, and tourmaline.

See description of Harrison Gneiss ([Oh](#)) for more information.

Descriptions from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Or - Ratlum Mountain Schist, undivided (Lower? Ordovician (Cambrian and Ordovician (Kroll, 1969)))

Or - Ratlum Mountain Schist (Lower? Ordovician)

Gray, medium-grained, interlayered schist and granofels, composed of quartz, oligoclase, muscovite (in the schist), biotite, and garnet, also staurolite and kyanite in the schist. Numerous layers and lenses of amphibolite; also some of quartz-spessartine (cotecule) and calc-silicate rock. Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

sg - Schist and granulite (Cambrian and Ordovician (Kroll, 1969))

Interlayered, medium-grained, poorly foliated, gray-to-buff, quartzo-feldspathic, granular rock, and medium- to coarse-grained, rusty schist. Granular layers contain mostly plagioclase, quartz, biotite, and muscovite. Schist layers contain mostly quartz, muscovite, and biotite, with accessory garnet and local sillimanite. Locally amphibolitic. Schist and granulite interlayers are commonly 1-2 cm thick. Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Ora - Amphibolite unit in Ratlum Mountain Schist (Lower? Ordovician)

Black or mottled, generally massive amphibolite and hornblende gneiss, composed of hornblende and andesine, commonly with minor quartz and magnetite, and locally with garnet, biotite, and epidote. Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

Orcs - Ratlum Mountain Schist, calc-silicate gneiss (Lower? Ordovician (Cambrian and Ordovician (Kroll, 1969)))

sg - Schist and granulite (Cambrian and Ordovician (Kroll, 1969))

Interlayered, medium-grained, poorly foliated, gray-to-buff, quartzo-feldspathic, granular rock, and medium- to coarse-grained, rusty schist. Granular layers contain mostly plagioclase, quartz, biotite, and muscovite. Schist layers contain mostly quartz, muscovite, and biotite, with accessory garnet and local sillimanite. Locally amphibolitic. Schist and granulite interlayers are commonly 1-2 cm thick.

Includes:

cs - Calc-silicate gneiss.

See description of Ratlum Mountain Schist ([Or](#)) for more information.

Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Orct - Ratlum Mountain Schist, coticule-bearing granulite interlayers (Lower? Ordovician (Cambrian and Ordovician (Kroll, 1969)))

sg - Schist and granulite (Cambrian and Ordovician (Kroll, 1969))

Interlayered, medium-grained, poorly foliated, gray-to-buff, quartzo-feldspathic, granular rock, and medium- to coarse-grained, rusty schist. Granular layers contain mostly plagioclase, quartz, biotite, and muscovite. Schist layers contain mostly quartz, muscovite, and biotite, with accessory garnet and local sillimanite. Locally amphibolitic. Schist and granulite interlayers are commonly 1-2 cm thick.

Includes:

ct - Coticule-bearing granulite interlayers.

See description of Ratlum Mountain Schist ([Or](#)) for more information.

Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Oru - Ratlum Mountain Schist, uncertain stratigraphic position (Lower? Ordovician (Cambrian and Ordovician (Kroll, 1969)))

sg0 - Schist and granulite (Cambrian and Ordovician (Kroll, 1969))

Similar to [sg](#) but stratigraphic position uncertain.

See description of Ratlum Mountain Schist ([Or](#)) for more information.

Description from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

OCr - Rowe Schist (Lower Ordovician and/or Cambrian)

Light-gray to silvery, fine- to medium-grained, generally poorly layered schist composed of quartz, muscovite, biotite, oligoclase, and generally garnet, staurolite, and kyanite or sillimanite. Layers of granofels common; also some layers of amphibolite, quartz-spessartine rock (coticule), and calc-silicate rock. Part of the following terrane: Iapetus (Oceanic) Terrane / Connecticut Valley Synclinorium. Description from source map: [Bedrock Geological Map of Connecticut](#)

OCs - Stockbridge Marble (Lower Ordovician and Cambrian)

White to gray, massive to layered marble, generally dolomitic but containing calcite marble in upper part, locally interlayered with schist of phyllite and with calcareous siltstone or sandstone. Part of the following terrane: Proto-North American (Continental) Terrane / Ordovician and Cambrian Shelf Sequence. Description from source map: [Bedrock Geological Map of Connecticut](#)

Cm - Manhattan Schist (Cambrian?)

Dark-gray to silvery, rusty-weathering, generally coarse grained, foliated but poorly layered to massive gneiss or schistose gneiss, composed of quartz, oligoclase, microcline, biotite, and muscovite, and generally sillimanite and garnet. Amphibolite layers locally, especially near base where in places separately mapped as unit Cma. Part of the following terrane: Proto-North American (Continental) Terrane / Taconic Allochthons (Displaced Iapetus Terrane). Description from source map: [Bedrock Geological Map of Connecticut](#)

Cd - Dalton Formation (Lower Cambrian and perhaps partly older)

Gray, tan-weathering, medium grained, generally well layered gneiss or feldspathic quartzite, composed of quartz, microcline, plagioclase, muscovite, biotite, and generally tourmaline; some schistose micaceous layers have sillimanite, commonly as quartz-sillimanite nodules rimmed with muscovite. Layers of purer quartzite in many areas, especially near the top or where the formation is thin. Part of the following terrane: Proto-North American (Continental) Terrane / Ordovician and Cambrian Shelf Sequence. Description from source map: [Bedrock Geological Map of Connecticut](#)

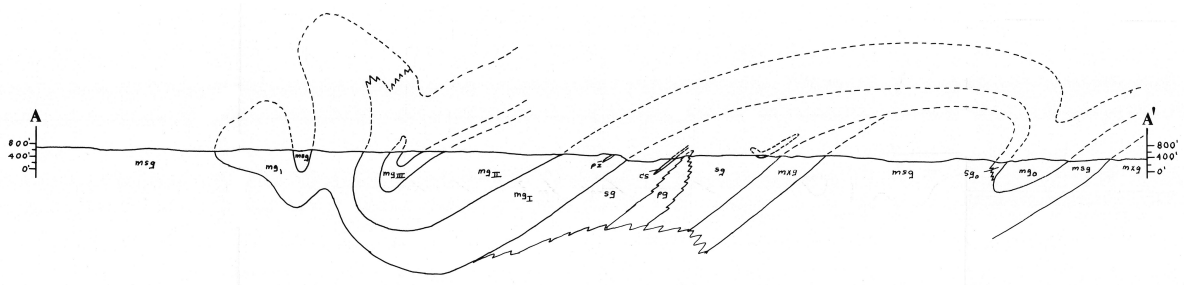
Yg - Gneiss of Highlands massifs (Proterozoic Y (may contain older rocks))

Mixture of rock types described below, where not separately mapped. Part of the following terrane: Proto-North American (Continental) Terrane / Proterozoic Massifs - "Grenville". Description from source map: [Bedrock Geological Map of Connecticut](#)

Geologic Cross Sections

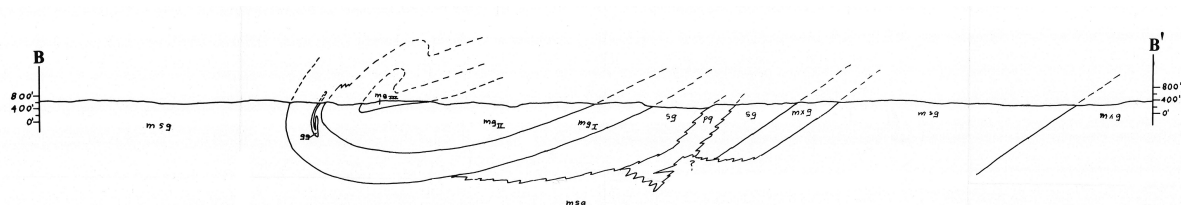
The geologic cross sections present in the GRI bedrock digital geologic-GIS data produced for Weir Farm National Historical Park, Connecticut (WEFA) are presented below. Each cross section graphic was scanned at a high resolution and can be viewed in more detail by zooming in (if viewing the digital format of this document).

Cross Section A-A'



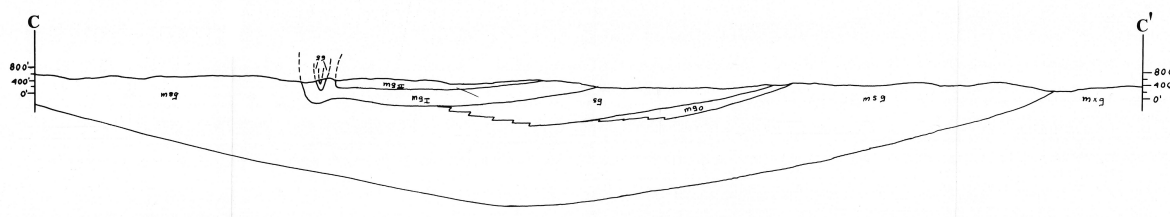
Graphic from source map: [Norwalk North Quadrangle \(Bedrock\)](#).

Cross Section B-B'



Graphic from source map: [Norwalk North Quadrangle \(Bedrock\)](#).

Cross Section C-C'



Graphic from source map: [Norwalk North Quadrangle \(Bedrock\)](#).

Ancillary Source Map Information

The following sections present ancillary source map information associated with bedrock source maps used for this project.

Bedrock Geological Map of Connecticut

The formal citation for this source.

Rodgers, John, 1985, Bedrock Geological Map of Connecticut: Connecticut Geological and Natural History Survey, Connecticut Natural Resources Atlas Series , 2 Sheets, scale 1:125,000 (*GRI Source Map ID 2299*).

The full map, as well as an additional map plates associated with the publication are available online at; http://cteco.uconn.edu/maps/state/Bedrock_Geologic_Map_of_Connecticut.pdf

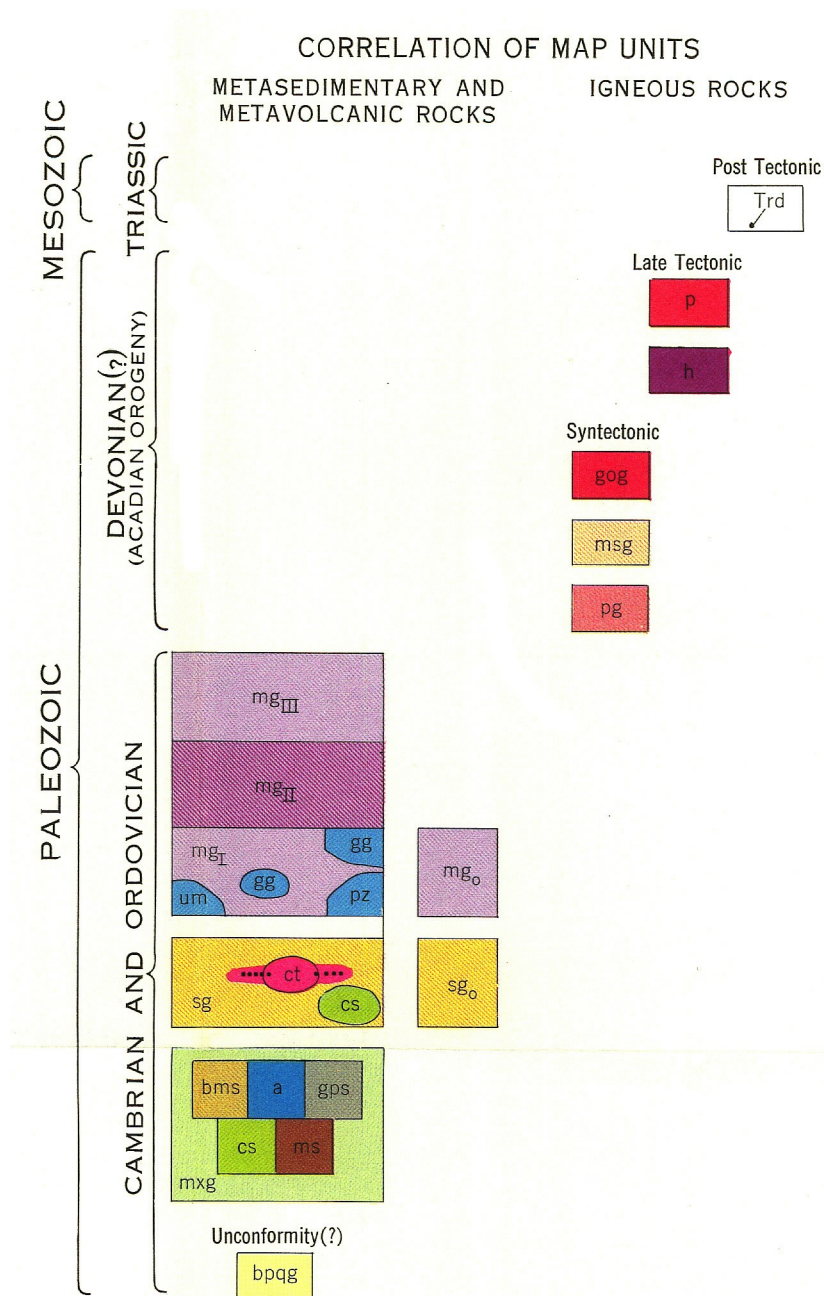
Norwalk North Quadrangle (Bedrock)

The formal citation for this source.

Kroll, R.L., 1969, Bedrock Geology of the Norwalk North Quadrangle, Connecticut: Connecticut Geological and Natural History Survey, Quadrangle Report 34, plate 1, scale 1:24,000 (*GRI Source Map ID 55025*).

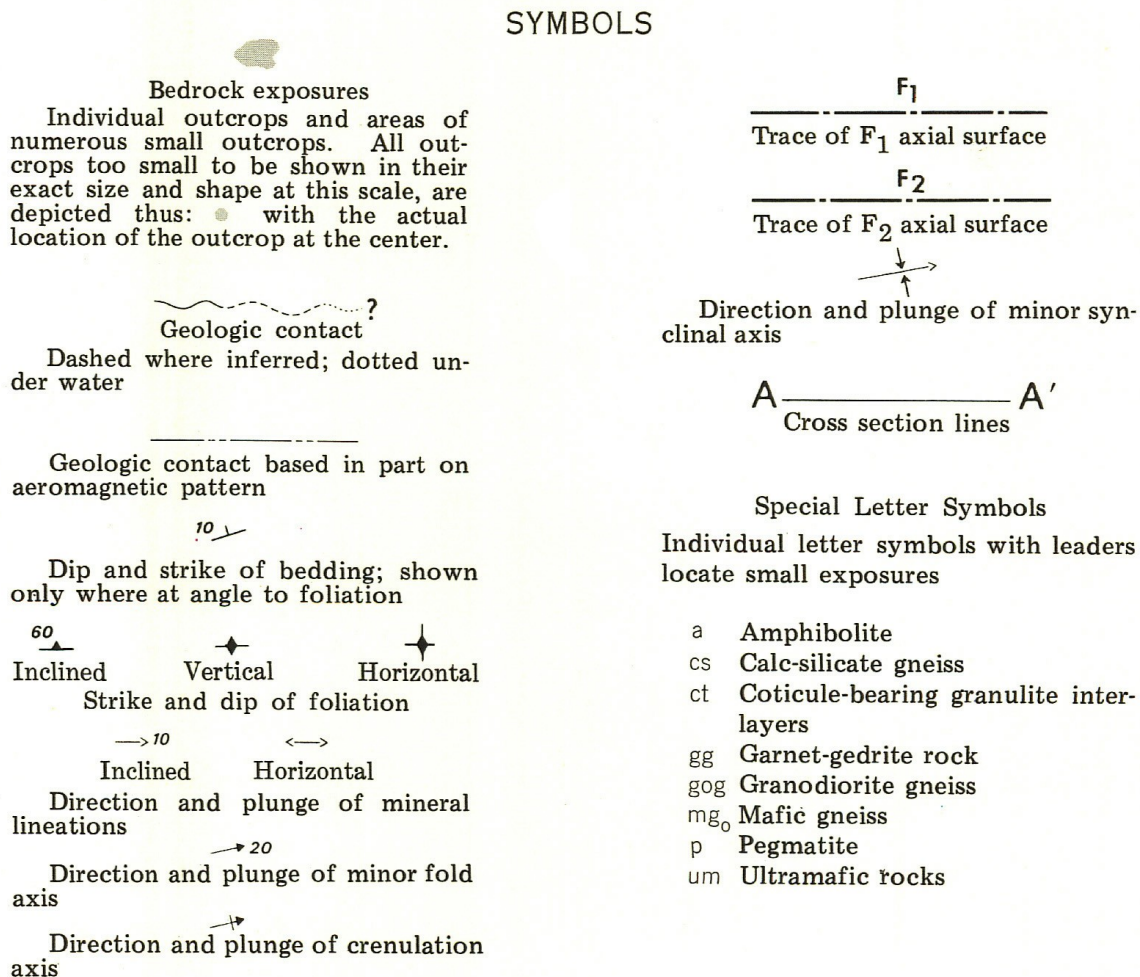
Prominent graphics and text associated with this source.

Correlation of Map Units



Graphic from source map: [Norwalk North Quadrangle \(Bedrock\)](#). Not all units that appear on the above correlation are within the extent of the GRI digital geologic-GIS data as only a portion of the full source map, the Norwalk North quadrangle, was used.

Legend



Graphic from source map: [Norwalk North Quadrangle \(Bedrock\)](#)

Pamphlet

The pamphlet that accompanies the publication for the Norwalk North quadrangle, as well as the Norwalk South quadrangle, is available online at: <https://portal.ct.gov/-/media/DEEP/geology/QuadReports/QR34pamphletpdf.pdf>

Surficial Geologic-GIS Map of Weir Farm National Historical Park and Vicinity

Surficial Map Unit List

The surficial geologic units present in the digital surficial geologic-GIS data produced for Weir Farm National Historical Park, Connecticut (WEFA) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Qaf - Artificial fill). Units are listed from youngest to oldest. No description for water is provided. Information about each geologic unit is also presented in the GRI Geologic Unit Information (WEFAUNI_surficial) table included with the GRI surficial geologic-GIS data. Some source unit symbols, names and/or ages may have been changed in this document and in the GRI digital geologic-GIS data. This was done if a unit was considered to be the same unit as one or more units on other source maps used for this project, and these unit symbols, names and/or ages differed. In this case a single unit symbol and name, and the unit's now recognized age, was adopted. Unit symbols, names and/or ages in a unit descriptions, or on a correlation of map units or other source map figure were not edited. If a unit symbol, name or age was changed by the GRI the unit's source map symbol, name and/or age appears with the unit's source map description.

Cenozoic Era

Quaternary Period

Holocene Epoch

[Qaf](#) - Artificial fill

[Qafg](#) - Artificial fill, graded

Post-Glacial Deposits

[Qal](#) - Alluvium

[Qs](#) - Swamps

Pleistocene Epoch

Glacial Ice Deposits

[Qtu](#) - Upper till

[Qtl](#) - Lower till

[Qtbc](#) - Till with bedrock outcrops

Glacial Stream and Lake Deposits

[Qgu](#) - Uncorrelated meltwater deposits

Deposits in the Housatonic River basin

[Qkb](#) - Glacial Lake Kenosia deposits

[Qdsb](#) - Glacial Lake Danbury deposits

[Qsb](#) - Sympaug Brook area deposits

[Qn](#) - Nashville Road area deposits

[Qwb](#) - Wolfpit Brook area deposits

Deposits in the Norwalk River basin

[Qgs](#) - Great Swamp area deposits

[Qesm](#) - East Branch Silvermine River area deposits

[Qnr6](#) - Norwalk River area deposits, unit 6

[Qnr5](#) - Norwalk River area deposits, unit 5

[Qnr4](#) - Norwalk River area deposits, unit 4

[Qnr3](#) - Norwalk River area deposits, unit 3

[Qcb](#) - Comstock Brook valley meltwater deposits

Deposits in the Saugatuck River Basin

[Qus](#) - Upper Saugatuck River area deposits

[Qsp](#) - Starrs Plain Road area deposits

[Qup](#) - Umpawaug Pond area deposits

[Qsr7](#) - Saugatuck River area deposits, unit 7

[Qsr6](#) - Saugatuck River area deposits, unit 6

[Qws](#) - West Branch Saugatuck River deposits

Paleozoic Era and Older

[PZPCbro](#) - Bedrock outcrops

Surficial Map Unit Descriptions

Descriptions of all geologic map units, generally listed from youngest to oldest, are presented below. Descriptions for each source map a unit is present on are presented.

Logs of wells and testholes that are referred to in parentheses in map-unit descriptions below (for example well Bt 42 and well Wp 39) are given in the Wells and Testholes sections (see [Ancillary Source Map Information section](#)).

Qaf - Artificial fill (Holocene)

af - Artificial fill (Holocene)

Earth materials and(or) manmade materials used as fill. Symbol afg indicates areas where the land surface has been extensively graded and natural land slopes have been destroyed. The extent of these units was mapped from aerial photographs taken in 1975. Numerous small deposits of fill along roads and railroads are not shown on map. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

af - Artificial fill (Holocene)

Earth materials and(or) manmade materials used as fill in construction sites or in large dams. Small dams and numerous small deposits of artificial fill along roads and railroads are not shown on map. The extent of unit af was mapped from aerial photographs taken in 1949 and 1975. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Qafg - Artificial fill, graded (Holocene)

af - Artificial fill (Holocene)

Earth materials and(or) manmade materials used as fill. Symbol afg indicates areas where the land surface has been extensively graded and natural land slopes have been destroyed. The extent of these units was mapped from aerial photographs taken in 1975. Numerous small deposits of fill along roads and railroads are not shown on map. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Postglacial Deposits

Qal - Alluvium (Holocene)

Qal - Alluvium (Holocene)

Gravel, sand, and silt deposited in stream channels and on flood plains by modern rivers and streams. Alluvium contains minor amounts of organic matter and is generally similar in texture to adjacent surficial deposits. Most alluvium in the Bethel quadrangle is thought to be less than 10 ft thick. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qal - Alluvium (Holocene)

Gavel, sand, and silt deposited in stream channels and on flood plains by modern rivers and streams. Alluvium contains variable amounts of organic matter and is generally similar in texture to adjacent surficial deposits. Alluvium of the Norwalk River is chiefly pebble-cobble gravel. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Qs - Swamps (Holocene)

Qs - Swamps (Holocene)

Organic matter mixed with sand, silt, and clay and deposited in poorly drained areas. Most swamp deposits are thought to be less than 10 ft thick; however, the Great Swamp, Kissen Brook, and Sympaug Brook areas are underlain by thicker deposits of peat and muck. As much as 61 ft of peat and muck underlie the Kissen Brook area (testhole log Dy 108). Numerous small swamp deposits in upland areas are not shown on map. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qs - Swamps (Holocene)

Sand, silt, and clay mixed with organic matter and deposited in poorly drained areas. Most swamp deposits are less than 10 ft thick; however, one deposit, at least 12-17 ft thick, is buried beneath artificial fill in the Norwalk River valley at Kellogg Pond. Numerous small swamp deposits in upland areas are not shown on map. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Glacial Ice Deposits

Qtu - Upper till (Pleistocene)

Qt - Till (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging in size from boulders to clay. The color of till in the Bethel quadrangle varies from yellowish gray to olive gray, and, less commonly, from light brown to moderate brown. The color and composition of till reflect those of the local gneisses, schists, and marbles from which it mainly was derived. Surface boulders are common on till deposits. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; however, the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth topography and constructional landforms, which mask the topography of the bedrock surface. Till in drumlins may be more than 100 ft thick; the maximum known thickness within the quadrangle is 100 ft at the north end of Umpawaug Hill.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer-grained, less stony, and darker than upper till. Lower till commonly contains iron-manganese-stained joints and the lower part of an old weathering profile. Clasts of what appeared to be lower till incorporated in an upper till matrix were exposed at the base of a temporary 15-foot excavation into the hillside along State Route 58, 0.03 mi south of the Danbury quadrangle border. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qt - Till (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging from boulders to clay. The color of till in the Norwalk North quadrangle varies from yellowish gray to light olive gray to brownish gray. Both its color and composition reflect those of the local bedrock (Kroll, 1977), from which it mainly was derived. Surface boulders are common on till deposits; Grumman Hill, for example, is strewn with boulders. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth, constructional landforms, which mask the topography of the bedrock

surface. Till in drumlins is in places more than 100 ft thick; the maximum known thickness within the quadrangle is 145 ft at the crest of Sturges Ridge.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer grained, less stony, and darker than upper till. Lower till commonly contains iron-manganese-stained joints and the lower part of an old weathering profile. A thin layer of upper till is believed to overlie lower till in most thick-till areas. The two tills are exposed in superposition in a cut along U.S. Route 7, 0.3 mi north of the interchange with the Merritt Parkway. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Qtl - Lower till (Pleistocene)

Qt - Till (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging in size from boulders to clay. The color of till in the Bethel quadrangle varies from yellowish gray to olive gray, and, less commonly, from light brown to moderate brown. The color and composition of till reflect those of the local gneisses, schists, and marbles from which it mainly was derived. Surface boulders are common on till deposits. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; however, the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth topography and constructional landforms, which mask the topography of the bedrock surface. Till in drumlins may be more than 100 ft thick; the maximum known thickness within the quadrangle is 100 ft at the north end of Umpawaug Hill.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer-grained, less stony, and darker than upper till. Lower till commonly contains iron-manganese-stained joints and the lower part of an old weathering profile. Clasts of what appeared to be lower till incorporated in an upper till matrix were exposed at the base of a temporary 15-foot excavation into the hillside along State Route 58, 0.03 mi south of the Danbury quadrangle border. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qt - Till (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging from boulders to clay. The color of till in the Norwalk North quadrangle varies from yellowish gray to light olive gray to brownish gray. Both its color and composition reflect those of the local bedrock (Kroll, 1977), from which it mainly was derived. Surface boulders are common on till deposits; Grumman Hill, for example, is strewn with boulders. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth, constructional landforms, which mask the topography of the bedrock surface. Till in drumlins is in places more than 100 ft thick; the maximum known thickness within the quadrangle is 145 ft at the crest of Sturges Ridge.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer grained, less stony, and darker than upper till. Lower till commonly contains iron-manganesestained joints and the lower part of an old weathering profile. A thin layer of upper till is believed to overlie lower till in most thick-till areas. The two tills are exposed in superposition in a cut along U.S. Route 7, 0.3 mi north of the interchange with the Merritt Parkway. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Qtbc - Till with bedrock outcrops (Pleistocene)

Qt - Till with bedrock outcrops (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging in size from boulders to clay. The color of till in the Bethel quadrangle varies from yellowish gray to olive gray, and, less commonly, from light brown to moderate brown. The color and composition of till reflect those of the local gneisses, schists, and marbles from which it mainly was derived. Surface boulders are common on till deposits. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; however, the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth topography and constructional landforms, which mask the topography of the bedrock surface. Till in drumlins may be more than 100 ft thick; the maximum known thickness within the quadrangle is 100 ft at the north end of Umpawaug Hill.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer-grained, less stony, and darker than upper till. Lower till commonly contains iron-manganese-stained joints and the lower part of an old weathering profile. Clasts of what appeared to be lower till incorporated in an upper till matrix were exposed at the base of a temporary 15-foot excavation into the hillside along State Route 58, 0.03 mi south of the Danbury quadrangle border. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qt - Till with bedrock outcrops (Pleistocene)

A poorly sorted, generally nonstratified mixture of rock particles ranging from boulders to clay. The color of till in the Norwalk North quadrangle varies from yellowish gray to light olive gray to brownish gray. Both its color and composition reflect those of the local bedrock (Kroll, 1977), from which it mainly was derived. Surface boulders are common on till deposits; Grumman Hill, for example, is strewn with boulders. Till blankets the bedrock surface and generally underlies stratified deposits. It commonly is less than 10 to 15 ft thick; the obliquely ruled pattern indicates areas where till is inferred from interpretation of aerial photographs to be greater than 10 to 15 ft thick. These areas were identified by their smooth, constructional landforms, which mask the topography of the bedrock surface. Till in drumlins is in places more than 100 ft thick; the maximum known thickness within the quadrangle is 145 ft at the crest of Sturges Ridge.

Two types of till are present within the map area. The most prevalent type, called upper till, was deposited by ice of the last glaciation (Pessl and Schafer, 1968). It is a loose to moderately compact, sandy and commonly stony material that locally contains lenses of sorted sand and gravel. Upper till

occurs throughout the map area and is the type of till usually present where till is less than 15 ft thick. The bulk of the material in areas of thick till (shown by obliquely ruled pattern) is believed to be an older till, called lower till, which was deposited during an earlier glaciation (Pessl and Schafer, 1968). This till is a moderately to extremely compact material that is typically finer grained, less stony, and darker than upper till. Lower till commonly contains iron-manganese-stained joints and the lower part of an old weathering profile. A thin layer of upper till is believed to overlie lower till in most thick-till areas. The two tills are exposed in superposition in a cut along U.S. Route 7, 0.3 mi north of the interchange with the Merritt Parkway. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Glacial Stream and Lake Deposits

These sediments consist of stratified gravel, sand, silt, and clay deposited by meltwater in glacial streams and lakes. Sediment texture at the surface is commonly mixed sand and gravel, or sand. Subsurface data indicate that fine-grained sand, silt, and clay exist locally beneath coarser sediments.

Study of meltwater deposits in southern New England since the 1940's has shown that they occur as discrete, mappable bodies of sediment formed at or near the edge of the northward-retreating ice sheet. Each body of sediment is called a morphosequence (Koteff, 1974; Koteff and Pessl, 1981), which is a body of stratified drift laid down, layer upon layer, at and beyond the margin of a glacier. Most morphosequences have a depositional surface profile that slopes away from the ice-marginal source of sediment; surface textures generally grade from coarse to finer downstream. Altitudes of many morphosequences were controlled by local, temporary spillways for glacial lakes or by fluvial base levels, which usually can be identified on the topographic base map. Each morphosequence records an approximate position of the stagnant ice margin during glacier retreat. The heads of some morphosequences have ice-contact slopes that resulted from melting of marginal stagnant lee and collapse of the deposit; the heads of other morphosequences are not collapsed and probably were not deposited in contact with the stagnant ice margin.

Most meltwater deposits on this map are differentiated with respect to the valley in which they occur. Within each valley, deposits are divided into morphosequences based on their surface altitudes, profiles, morphology, surface textures, and internal structures according to the method described by Koteff (1974). Some map units comprise more than one morphosequence, because in many places, morphosequences cannot be differentiated on the basis of existing data. Description from source maps: [Bethel Quadrangle \(Surficial\)](#) and [Norwalk North Quadrangle \(Surficial\)](#)

Qgu - Uncorrelated meltwater deposits (Pleistocene)

Small, generally ice-contact deposits graded to local thresholds. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Deposits in the Housatonic River basin

Qkb - Glacial Lake Kenosia deposits (Pleistocene)

Interbedded sand, silt, and clay, as much as 116 ft thick (testholes Dy 70 and Dy 74). South of Miry Brook Road, these sediments are overlain by swamp deposits, 8 to 61 ft thick, which apparently increase in thickness from north to south (well Dy 68; testhole Dy 108). Qkb deposits are the lake-bottom sediments of glacial Lake Kenosia, which occupied the Mill Plain Swamp drainage basin in the Danbury and Bethel quadrangles (Thompson, 1975). This lake initially may have drained through the 505-foot-altitude spillway southeast of Spruce Mountain, but later drained eastward into glacial Lake Danbury in the Danbury quadrangle (Thompson, 1975). Description from source map: [Bethel](#)

Quadrangle (Surficial)

Qdsb - Glacial Lake Danbury deposits (Pleistocene)

Sand, silt, and clay, locally interbedded with sand and gravel, from 10 ft to more than 135 ft thick (testholes Bt 31 and Bt 42; well Bt 42), but typically 45 to 57 ft thick (testholes Bt 32 and Bt 35; well Bt 39). This unit is continuous with unit Qsrb in the Danbury quadrangle and is lake-bottom sediment of the Saugatuck River stage of glacial Lake Danbury (Thompson, 1975). This stage of the lake drained south across the Housatonic-Saugatuck drainage divide through the spillway at the head of Sympaug Brook valley, which was also the spillway for older Qsb deposits. Unit Qdsb sediments are generally at an altitude of 385 ft in the Bethel quadrangle; they filled Sympaug Brook lowland and its tributary lowland to the west. Peat and muck as much as 15 ft thick overlie lacustrine sediments in the swamp north of St. Mary's Cemetery (well Bt 39). Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qsb - Sympaug Brook area deposits (Pleistocene)

Mostly sand, generally 40 to 60 ft thick. Beds of fluvial cobble-pebble gravel overlie sand at St. Mary's Cemetery. At the base of this kame, very fine lacustrine sand lies directly on bedrock. An abandoned pit west of St. Mary's Cemetery exposed fine to medium lacustrine sand (R. L. Melvin, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). At the north end of Sympaug Pond, a pit exposed 12 ft of fine to coarse sand in ripple-drift cross laminations and trough crossbeds. The sand contained dropstones and pods of till and was deformed by high-angle faults. It appears that these kames formed as individual ice-contact deltas in an ice-marginal lake that drained south through a spillway at 410 ft altitude in the Housatonic-Saugatuck drainage divide. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qn - Nashville Road area deposits (Pleistocene)

Cobble gravel, as much as 30 ft thick. Exposures showed imbricate bedding and poor sorting of gravel. Till and bedrock are exposed in the bottom of the large abandoned pit on the east side of Nashville Road. Qn sediments most likely were deposited as fluvial sediments in the stagnant ice margin when it stood along the north slope of hills south of Bethel village. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qwb - Wolfpit Brook area deposits (Pleistocene)

Chiefly sand with pebble-cobble gravel lenses, as much as 50 ft thick. Collapsed bedding is exposed in all pits and excavations in this deposit. Qwb sediments were deposited in the stagnant ice margin when it stood just north of the Housatonic-Saugatuck drainage divide. The southernmost part of Qwb is graded to a spillway in the divide at 641 ft. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Deposits in the Norwalk River basin

Qgs - Great Swamp area deposits (Pleistocene)

Sand, silt, and clay, from 13 to more than 80 ft thick (testholes R 5 and R 7), which underlie much of Great Swamp. Deposits appear to be lacustrine sediments that filled a closed bedrock basin (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). The

southern outlet of this basin, a sill in bedrock at 580 ft altitude, most likely controlled the level of a lake in the basin. A thin layer of fluvial pebble gravel overlies sand in the 585-foot surface along State Route 35 south of Outpost Inn Pond; other mounds that protrude from Great Swamp to altitudes of 570 to 580 ft likewise may contain patches of fluvial sediment that overlie lacustrine sediments. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qesm - East Branch Silvermine River area deposits (Pleistocene)

Qesm - East Branch Silvermine River area deposits (Pleistocene)

Sand, as much as 50 ft thick. Deposits appear to be the lacustrine fill of a closed bedrock basin that has two outlets in the Norwalk North quadrangle (London, 1984), both at approximately 550 ft altitude. The basin fill aggraded to one or both of these spillways. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qesm - East Branch Silvermine River area deposits (Pleistocene)

Sand, as much as 50 ft thick (well Wn 58). The deposit heads in the Bethel quadrangle, 0.3 mi north of the Norwalk North quadrangle border. It appears to be the lacustrine fill of a closed basin in bedrock or till. The basin has two outlets, one slightly higher and one slightly lower than 550 ft altitude. The deposits graded to one or both of these spillways. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Qnr6 - Norwalk River area deposits, unit 6 (Pleistocene)

Qnr6 - Sand and gravel interbedded with sand, from 25 ft to as much as 84 ft thick (Pleistocene) (testhole Dy 1 and well R 19)

The head of these deposits is coarse, fluvial gravel composed of cobbles, pebbles, and boulders. The beds are extensively collapsed; faulted beds of poorly sorted gravel containing till lenses and boulders were exposed in two abandoned pits on the east side of U.S. Route 7. Downstream deposits are predominantly sand (wells R 13, R 15, and R 19; testhole R 6), which fills a closed depression in the bedrock surface (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.), and which most likely is deltaic or lacustrine. This basin fill is covered in most places by a thin layer of sand and gravel. The surface of Qnr6 (appears to grade to two 495-foot-altitude thresholds on bedrock 0.65 mi south of Little Pond. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qnr5 - Norwalk River area deposits, unit 5 (Pleistocene)

Qnr5 - Interbedded sand and gravel and sand, as much as 45 ft thick (Pleistocene) (testhole R 2).

Unit may comprise several morphosequences that cannot be differentiated on the basis of existing data. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qnr4 - Norwalk River area deposits, unit 4 (Pleistocene)

Qnr4 - Chiefly coarse fluvial gravel and sand, from 5 ft to as much as 32 ft thick (Pleistocene) (testhole Rd 1; wells Wn 31 and R 23).

North of Branchville, boulder-cobble gravel was seen to overlie fine-grained fluvial pebble gravel and sand in the pit just north of the school at Branchville (R. B. Ryder, unpub. data, 1965; data are on file at U.S. Geological Survey, Hartford, Conn.). From Branchville south to Georgetown, surface textures range from cobble-boulder to pebble-cobble gravel. At Branchville and at Georgetown, deposits were

seen to fill local depressions (pockets) between bedrock knobs. Elsewhere, irregular surface topography may have resulted from collapse. Unit Qnr4 deposits are graded to one or both of two bedrock thresholds south of Georgetown. The southernmost part of these deposits, south of Branchville and west of Factory Pond, reaches an altitude of more than 350 ft and appears to grade to a local spillway at 355 ft. This part of the deposit probably is slightly older than the rest of Qnr4, which appears to grade to a 335-foot threshold south of Factory Pond. It appears that the Norwalk River valley at Factory Pond was obstructed by ice or glacial drift when the oldest part of Qnr4 was deposited. Following erosion of this obstruction, meltwater was diverted from the high-level spillway to the Norwalk valley threshold south of Factory Pond. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qnr3 - Norwalk River area deposits, unit 3 (Pleistocene)

Qnr3 - Norwalk River area deposits, unit 3 (Pleistocene)

South of Strong Comstock School

Chiefly beds of sand and gravel (wells Wn 4, Wn 12, Wn 20, Wn 21, and Wn 60), which locally overlie sand (wells Wn 32 and Wn 42) in the bedrock basin 0.75 mi north of South Wilton (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). Deposits are as much as 138 ft thick north of South Wilton (well Wn 42) and as much as 40 ft thick at South Wilton (well Wn 60). Surface textures grade from cobble to pebble gravel. This part of Qnr3, from Strong Comstock School to the gorge north of Winnipauk Millpond, is a meltwater stream terrace cut into deposits of Qnr2, which have been exposed in the large pit 0.85 mi north of South Wilton. Incision and reworking of Qnr2 sediments took place as Qnr3 sediments were deposited north of Strong Comstock School. This meltwater terrace appears to have graded to a bedrock threshold in the gorge 0.4 mi north of Winnipauk Millpond. The altitude of this threshold was approximately 110 ft .

North of Strong Comstock School

In the area north of Cannondale, sand and gravel, as much as 83 ft thick (testhole Wn 3; well Wn 37); south of Cannondale, along the Norwalk River, sand and gravel, as much as 46 ft thick (well Wn 24); and west of Cannondale, in the broad lowland, 15-18 ft of sand and gravel over 41 to 110 ft of sand (testhole Wn 14; well Wn 54) that fills a bedrock basin (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). The deposits north of Cannondale have collapsed topography, and excavations show collapsed beds of poorly sorted boulder and boulder-cobble gravel. South of Cannondale, surface texture is chiefly pebble-cobble gravel. Surface material is fluvial; however, the thick sand deposits underlying the lowland west of Cannondale probably are lacustrine. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qcb - Comstock Brook valley meltwater deposits (Pleistocene)

Glacial meltwater deposits of unknown texture and thickness in Comstock Brook valley. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Deposits in the Saugatuck River Basin

Qus - Upper Saugatuck River area deposits (Pleistocene)

Chiefly gravel, as much as 50 ft thick (wells Dy 11 and Dy 12). Fluvial boulder-cobble gravel and cobble gravel are exposed in an abandoned pit and other small exposures along West Redding Road. Deposits are collapsed around swamps and probably were built on and around detached ice blocks. Unit Qus deposits appear to be graded to a threshold in the Saugatuck River valley near the Danbury-Redding corporate boundary. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qsp - Starrs Plain Road area deposits (Pleistocene)

Chiefly gravel, as much as 25 ft thick (well Dy 14). Bedrock is exposed in the floors and walls of abandoned pits. These deposits occupy a shallow trough in the upland bedrock surface (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). Grain size and sorting are highly variable. Gravel includes: a) crudely to moderately well sorted and stratified cobble-boulder gravel, containing lenses of till, and b) moderately to well sorted and stratified pebble-cobble gravel, containing sand matrix. Collapsed bedding is characteristic of the cobble-boulder gravel. Qsp deposits display collapsed topography along their entire length, and they probably were laid down around ice blocks that occupied depressions now filled by swamps. Qsp most likely comprises two morphosequences graded to thresholds in bedrock at 545 ft altitude. An older morphosequence probably was graded to a threshold at the southeast end of the trough; a younger morphosequence probably was graded to the outlet at the northeast end of the trough. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qup - Umpawaug Pond area deposits (Pleistocene)

Sand and gravel, as much as 50 ft thick, that fills a closed bedrock basin (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.). A former pit northwest of Umpawaug Pond exposed collapsed beds of poorly sorted fluvial pebble-cobble-boulder gravel (R. B. Ryder, unpub. data, 1965; data are on file at U.S. Geological Survey, Hartford, Conn.). This gravel was as much as 30 ft thick in places, but was only a thin mantle over bedrock knobs elsewhere. A small pit at the southwest end of Huckleberry Swamp exposed well-sorted sand (R. B. Ryder, unpub. data, 1965; data are on file at U.S. Geological Survey, Hartford, Conn.). Unit Qup deposits are extensively collapsed and were laid down around detached ice blocks that probably occupied the areas now filled by swamps. The surface of Qup sediments is graded to a bedrock spillway through the Norwalk-Saugatuck drainage divide, 0.2 mi north of Topstone. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qsr7 - Saugatuck River area deposits, unit 7 (Pleistocene)

Sand and gravel interbedded with sand, commonly less than 15 ft thick. (testhole Rd 6). Northwest of Marchant Road and State Route 53, the deposits form a thin mantle of sand and gravel over the knobby bedrock surface. South and east of these roads, the deposits consist of sand and gravel overlying sand, and are 46 to 58 ft thick. (testhole Rd 3; well Rd 45). This sand fills a closed bedrock basin (R. Vitali and R. B. Ryder, unpub. data, 1966; data are on file at U.S. Geological Survey, Hartford, Conn.) and is probably deltaic or lacustrine. Surface material is fluvial pebble and cobble gravel. Deposits of unit Qsr7 show collapsed topography along their length, indicating that they were deposited on and around detached blocks of ice. The part of Qsr7 north of the Housatonic-Saugatuck drainage divide is a collapsed head of outwash. The surface of Qsr7 is graded to one or both of two bedrock spillways at 375 ft altitude. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qsr6 - Saugatuck River area deposits, unit 6 (Pleistocene)

Sand and gravel, probably less than 30 ft thick, and probably fluvial in origin. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Qws - West Branch Saugatuck River deposits (Pleistocene)

Sand and gravel, probably less than 30 ft thick. Pebble gravel is the predominant surface material. Deposits are chiefly fluvial but may locally contain beds of lacustrine sand and silt. Unit Qws is probably a combination of several morphosequences, but they cannot be differentiated on the basis of the available surface and subsurface data. Description from source map: [Bethel Quadrangle \(Surficial\)](#)

PZPCbro - Bedrock outcrops (Paleozoic-Precambrian)**Bedrock outcrops:**

Solid areas represent large, continuous or nearly continuous outcrops; horizontally ruled pattern indicates areas of numerous or closely spaced outcrops separated by thin deposits of till. Outcrops compiled from data of R. B. Ryder (unpub. data, 1964-65) and R. L. Melvin (unpub. data, 1966). Closely spaced outcrops mapped from topographic contours and aerial photographs, and from outcrop data of J. W. Clarke (unpub. data, 1955-56). Description from source map: [Bethel Quadrangle \(Surficial\)](#)

Bedrock outcrops:

Solid areas represent continuous outcrop (Kroll, 1977); horizontally ruled pattern indicates areas of numerous or closely spaced outcrops separated by thin deposits of till (adapted from Kroll, 1977). Additional outcrops compiled from unpublished data prepared by R. B. Ryder in 1964-65; data are on file at U.S. Geological Survey, Hartford, Conn. Description from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Ancillary Source Map Information

The following sections present ancillary source map information associated with surficial source maps used for this project.

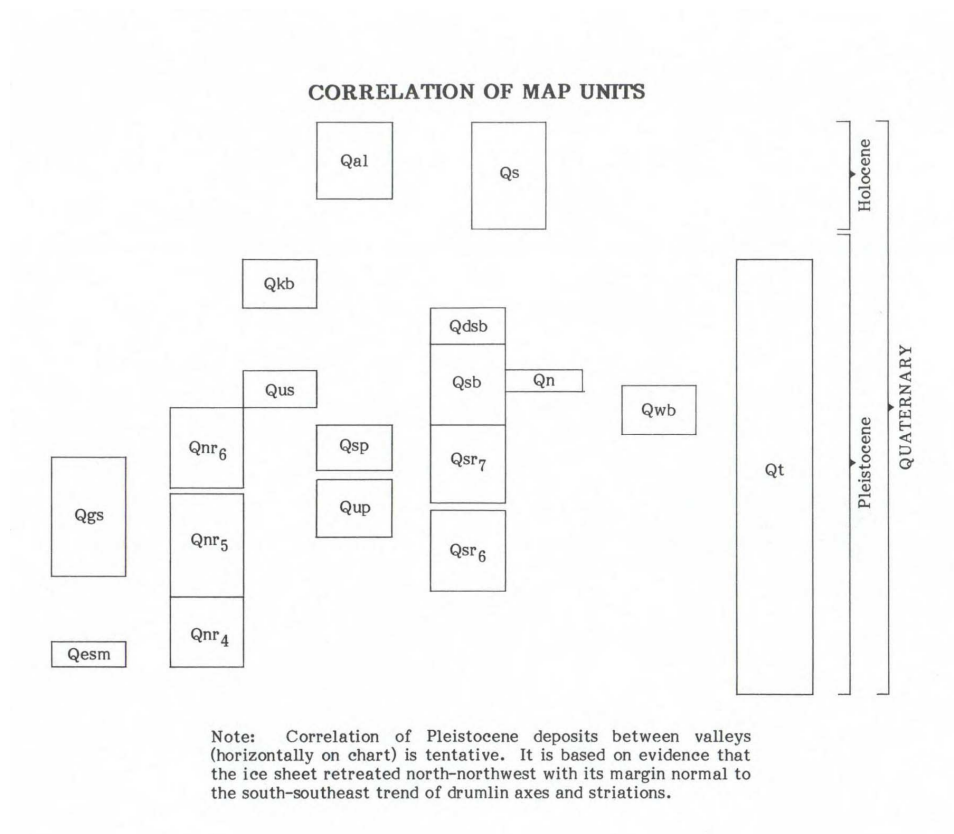
Bethel Quadrangle (Surficial)

The formal citation for this source.

London, E.H., 1984, Surficial Geologic Map of the Bethel Quadrangle, Connecticut: U.S. Geological Survey, Miscellaneous Field Studies Map MF-1519, scale 1:24,000 (*GRI Source Map ID 2954*).

Prominent graphics and text associated with this source.

Correlation of Map Units

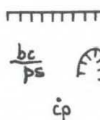


Graphic from source map: [Bethel Quadrangle \(Surficial\)](#)

Legend

MAP SYMBOLS

- Contact
- Long axis of drumlin—Dot at crest of drumlin
- 5-10 E Glacial striations on bedrock—Observation point at tip of arrow; number indicates direction of ice movement, in degrees east of south
- 205' Meltwater spillway—Number indicates altitude of spillway, in feet
- Meltwater channel cut in till or stratified drift

	Housatonic-Saugatuck River drainage divide		
	Norwalk-Saugatuck River drainage divide		
	Abandoned quarry		
	Inactive pit in stratified material (sand, gravel) or in till		
	Excavations in gravel, sand, and till—Large pits shown by hachures; shovel or auger holes shown by dots. Letter symbol indicates texture; multiple texture symbols indicate texture in order of decreasing abundance. Superposed symbols indicate superposition of materials in exposure		
s	sand	}	Includes 20 to 60 percent interstitial and interbedded sand
b	boulder gravel		
c	cobble gravel		
p	pebble gravel		
t	till		
af	artificial fill		

Graphic from source map: [Bethel Quadrangle \(Surficial\)](#)

Wells and Testholes

WELLS AND TESTHOLES

Locations of selected wells and testholes are shown on map. Logs listed below are modified from graphic logs published by Thomas and others (1969) and Melvin (1970). Logs for two additional borings (Rd 6 and Rd 45) were obtained from U.S. Geological Survey, Hartford, Conn.

Map symbols

- R 2 - testhole
- Dy 11 - water well

Letter and number designations are from Thomas and others (1969) and Melvin (1970): R, Ridgefield; Rd, Redding; Wn, Wilton; Dy, Danbury; Bt, Bethel

Log symbols

- sc - silt and (or) clay
- sf - fine to very fine sand and silt; may include some medium sand
- sm - very fine to medium sand
- sc - medium to very coarse sand; may include some very fine gravel
- sg - sand and gravel; contains beds of sand in which grain sizes range from 0 to 25 percent gravel, and beds of gravel in which grain sizes range from 0 to 75 percent sand
- g - gravel; may contain as much as 75 percent sand
- m - peat and muck
- t - till
- rk - bedrock
- R - refusal
- e - end of boring
- af - artificial fill

Numbers in parentheses are altitudes of wells and testholes in feet; numbers preceding symbols are thicknesses of strata in feet

Logs associated with wells and testholes in the GRI digital geologic-GIS data are presented below. As noted above, letter and number designations were assigned to each well and testhole (e.g., "R 2" is the "Ridgefield 2" testhole).

RIDGEFIELD

Testholes—

R 2 (405)	R 5 (575)	R 6 (495)	R 7 (582)
5 af	7 m	2 af	50 sc
2 sf	13 ~~sf~~	5 sm	20 sm
10 sg	7 t	5 sg	13 sf
23 sf	e	52 sm	R
5 sg		1 t	
5 sf		e	
2 t			
e			

Wells—

R 13 (505)	R 15 (500)	R 19 (505)	R 23 (348)
26 sc	5 sg	5 sg	30 g
7 sg	5 sm	5 sc	rk
4 sc	5 sc	7 sm	
rk	35 sm	8 g	
	5 sc	2 t	
	7 sm	e	
	2 g		
	11 sf		
	5 sg		
	rk		

WILTON

Well—

Wn 31 (345)
32 g
rk

REDDING

Testholes—

Rd 1 (321)	Rd 3 (370)	Rd 6 (375)	Well— Rd 45 (370)
5 sg	2 sg	8 sg	24 sg
8 t	27 sm	7 sf	19 sm
e	29 sc	5 t	3 g
	t	rk	R

DANBURY

Testholes—

Dy 1 (510)	Dy 70 (455)	Dy 74 (457)	Dy 108 (452)
6 g	15 sc	15 sf	61 m
4 sc	80 ~~sf~~	45 ~~sf~~	4 sf
53 g	21 sf	9 s	16.5 s
21 sf	R	R	e
e			

Wells—

Dy 11 (485)	Dy 12 (505)	Dy 14 (535)	Dy 68 (455)
13 g	22 g	25 g	8 m
37 sg	e	rk	92 sf
e			10 sc
			e

BETHEL			
Testholes—			
Bt 31 (368)	Bt 32 (375)	Bt 35 (375)	Bt 42 (375)
10 ~~sf~~	5 af	10 sf	40 sm
10 t	17 g	20 ~~sf~~	60 sf
rk	31 ~~sf~~	15 sm	35.5 ~~sf~~
	1 s	4 t	e
	1 t		
	rk		
Wells—			
Bt 39 (368)	Bt 42 (368)		
15 m	10 se		
16 ~~sf~~	30 s		
5 se	5 se		
5 sg	5 sm		
5 sm	5 se		
16 sg	10 sm		
2 t	30 se		
rk	2 t		
	rk		

Graphic from source map: [Bethel Quadrangle \(Surficial\)](#)

References

- Koteff, Carl, 1974, The morphologic sequence concept and deglaciation of southern New England, in Coates, D. R., ed., *Glacial geomorphology*: Binghamton, New York, State University of New York, Publications in Geomorphology, p. 121-144.
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- Thompson, W. B., 1975, Surficial geologic map of the Danbury quadrangle, Connecticut: U.S. Geological Survey Open-File Report 75-547.

References from source map: [Bethel Quadrangle \(Surficial\)](#)

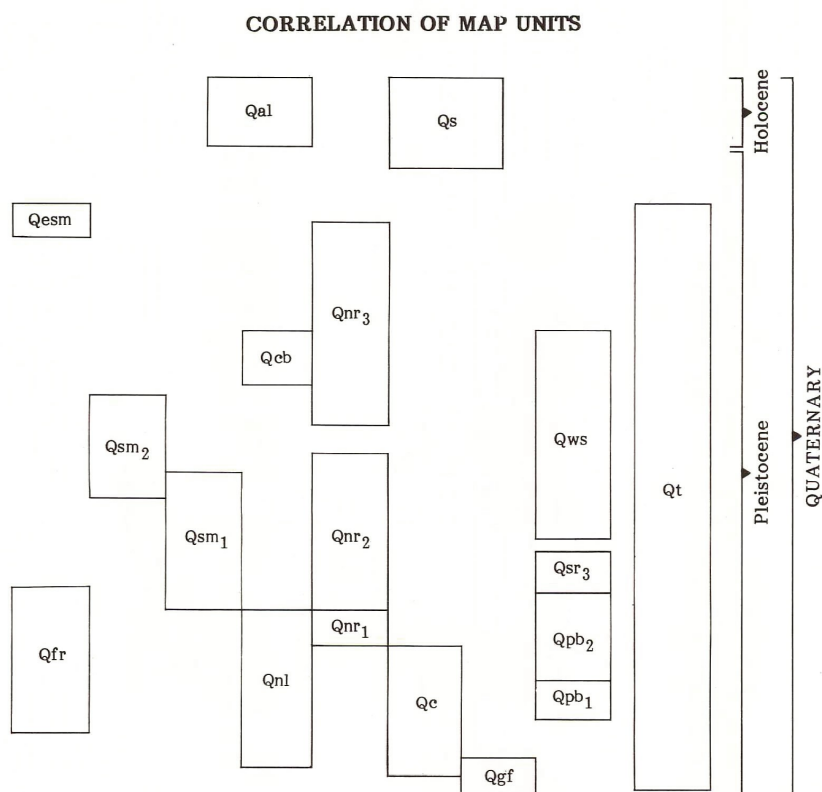
Norwalk North Quadrangle (Surficial)

The formal citation for this source.

London, E.H., 1984, Surficial Geologic Map of the Norwalk North Quadrangle, Connecticut: U.S. Geological Survey, Miscellaneous Field Studies Map MF-1520, scale 1:24,000 (*GRI Source Map ID 2953*).

Prominent graphics and text associated with this source.

Correlation of Map Units

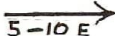
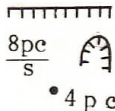


Note: Correlation of Pleistocene deposits between valleys (horizontally on chart) is tentative. It is based on evidence that the ice sheet retreated north-northwest with its margin normal to the south-southeast trend of drumlin axes and striations.

Graphic from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Legend

MAP SYMBOLS

-  Contact
-  Esker or ice-channel filling—Chevrons indicate inferred flow direction during deposition
-  Long axis of drumlin—Dot at crest of drumlin
-  Glacial striations on bedrock (one locality, in New Canaan)—Observation point at tip of arrow; number indicates direction of ice movement, in degrees east of south
-  Meltwater spillway—Number indicates altitude of spillway, in feet
-  Meltwater channel cut in till
-  Active
-  Inactive
-  Excavations in gravel, sand, and till—Large pits shown by hachures; shovel or auger holes shown by dots. Number where given indicates observed thickness, in feet; letter symbol

indicates texture. Multiple texture symbols indicate texture in order of decreasing abundance; superposed symbols indicate superposition of materials in exposure

s	sand	
b	boulder gravel	} Includes 20 to 60 percent interstitial and interbedded sand
c	cobble gravel	
p	pebble gravel	
t	till	
af	artificial fill	

Graphic from source map: [Norwalk North Quadrangle \(Surficial\)](#)

Wells and Testholes

WELLS AND TESTHOLES

Locations of selected wells and testholes are shown on map. Logs listed below are modified from graphic logs published by Thomas and others (1969).

Map symbols

- Nw 49 - testhole
- Wn 20 - water well

Letter and number designations are from Thomas and others (1969): Ncn, New Canaan; Nw, Norwalk; Wn, Wilton; Wp, Westport

Log symbols

- sf - fine to very fine sand and silt; may include some medium sand
- sm - very fine to medium sand
- sc - medium to very coarse sand; may include some very fine gravel
- sg - sand and gravel; contains beds of sand in which grain sizes range from 0 to 25 percent gravel, and beds of gravel in which grain sizes range from 0 to 75 percent sand
- g - gravel; may contain as much as 75 percent sand
- m - peat and muck
- t - till
- rk - bedrock
- R - refusal
- e - end of boring
- af - artificial fill

Numbers in parentheses are altitudes of wells and testholes in feet; numbers preceding letter symbols are thicknesses of strata in feet

Logs associated with wells and testholes in the GRI digital geologic-GIS data are presented below. As noted above, letter and number designations were assigned to each well and testhole (e.g., "NW 7" is the "New Canaan 7" well).

NEW CANAAN

Wells--

Nen 7 (265)	Nen 8 (315)	Nen 28 (265)	Nen 31 (150)
10 g	12 g	2 af	36 sg
rk	rk	8 sf	3 t
		46 sg	rk
		rk	

NORWALK

Testholes--

Nw 49 (69)	Nw 60 (47)	Nw 61 (50)	Nw 63 (53)
2 af	12 m	3 af	2 af
3 sg	2 sm	21 sm	62 sg
14 g	6 sc	14 sf	rk
14 sm	10 sg	22 sg	
5 t	8 sc	rk	
rk	4 sg		
	e		

Nw 64 (86)
 37 g
 6 sc
 rk

Wells--

Nw 4 (90)	Nw 17 (45)	Nw 19 (50)	Nw 20 (89)
20 g	4 af	10 af	10 m
32 sg	10 g	17 m	42 sg
rk	59 sf	4 sf	rk
	6 sc	10 sc	
	1 sg	39 sg	
	rk	3 t	
		rk	

WESTPORT

Wells--

Wp 37 (82)	Wp 39 (65)	Wp 40 (100)	Wp 46 (60)
62 g	3 m	15 g	62 sg
e	29 g	rk	rk
	rk		

Wp 48 (65)
 72 g
 rk

WILTON

Testholes--

Wn 3 (255)	Wn 14 (230)
2 af	1 m
11 sg	2 sc
22 sm	16 sg
50 sg	15 sc
R	13 sm
	13 sf
	2 t
	rk

Wells--

Wn 4 (186)	Wn 12 (126)	Wn 20 (170)	Wn 21 (186)
110 sg	12 af	1 af	2 af
15 g	8 sg	13 sg	28 sg
rk	20 sf	14 sm	10 sc
	e	6 sg	22 sg
		32 sf	rk
		rk	
Wn 24 (215)	Wn 32 (155)	Wn 36 (194)	Wn 37 (251)
2 af	18 g	49 g	31 sg
46 sg	67 sf	rk	rk
rk	20 g		
	rk		
Wn 40 (159)	Wn 42 (160)	Wn 54 (208)	Wn 58 (554)
18 g	22 g	15 g	50 sm
rk	116 sf	110 sm	rk
	rk	rk	
Wn 59 (190)	Wn 60 (134)	Wn 61 (189)	Wn 62 (180)
20 g	35 g	25 sg	25 sg
rk	5 sg	rk	rk
	e		

Graphic from source map: [Norwalk North Quadrangle \(Surficial\)](#)

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References from source map: [Norwalk North Quadrangle \(Surficial\)](#)

GRI Digital Data Credits

This document was developed and completed by Stephanie O'Meara (Colorado State University) for the NPS Geologic Resources Division (GRD) Geologic Resources Inventory (GRI) Program. Quality control of this document by James Winter (Colorado State University).

The information in this document was compiled from GRI source maps, and is intended to accompany the digital geologic-GIS maps and other digital data for Weir Farm National Historical Park, Connecticut (WEFA) developed by Stephanie O'Meara (see the [GRI Digital Maps and Source Map Citations](#) section of this document for all sources used by the GRI in the completion of this document and related GRI digital geologic-GIS maps).

GRI finalization by Stephanie O'Meara.

GRI program coordination and scoping provided by Bruce Heise, Jason Kenworthy and Tim Connors (NPS GRD, Lakewood, Colorado).