

Water Withdrawal Committee Presentation

Rural Water Supply During Drought Conditions

Team Members:

Stephanie Redmond – Supervisor Town of Enfield

Liz Cameron – Tompkins County Health Department

John Mawdsley – Retired Hydrologist

Bill Kappel – USGS Retired Hydrogeologist

Water Withdrawal Committee Presentation

Rural Water Supply During Drought Conditions

Water Resource Council Charge to Committee - Anticipate the availability of water supply in public water systems during potential drought conditions.

Establish a system to track current water usage and proposed development to estimate water demand in future years.

As to the initial WRC charge - John Mawdsley and Liz Cameron of this committee have been utilizing public supply water-use information provided to Tompkins County Health Department.

Assessment record summary:

1. Monthly water-supply records from 8 large public-water suppliers between 2015 and 2020 were obtained through the Tompkins County Health Department.
2. Of the 8 suppliers, 3 were surface water sourced: Bolton Point (Cayuga Lake), City of Ithaca (Sixmile Creek), and Cornell University (Fall Creek).
3. The 5 remaining suppliers used groundwater: Danby, Dryden, Groton, Newfield, and Trumansburg.

Their findings so far:

4. Average water use during the assessed period was variable but overall appears to have declined for an unknown reason(s). The County population over the last 10 years has remained relatively stable. Further analysis and insights from the suppliers is needed.
5. During 2016 when there was a surface-water drought, the City had the lowest per-capita water use, but presumably utilized water from Bolton Point which had the highest per-capita water use.
6. Future projections of growth within these service areas and the County (by Town) is needed. The Tompkins County Planning Department and possibly the suppliers themselves might be able to provide some suggestions on growth potential.

But there is a substantial part of the county population (~50 percent? – working to confirm this number) who get their drinking water from non-public supplies (primarily drilled wells, dug wells, springs, or other source).

These sources are also impacted by drought conditions, but the public has limited water-resource information to help them understand local and regional water level changes related to drought and our changing climate.

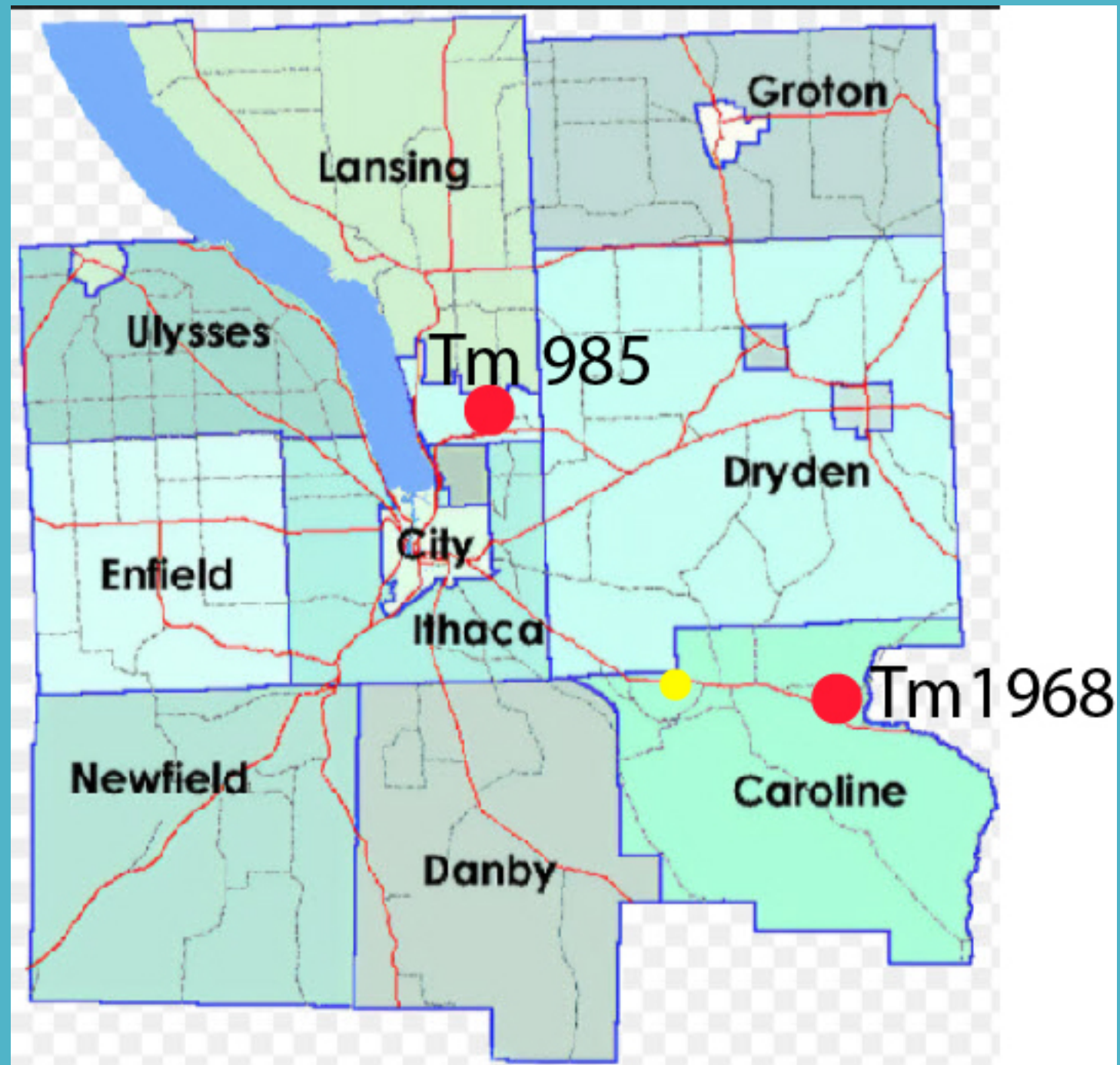
Tompkins County has two long-term monitoring wells as part of the NYS-DEC/USGS Drought-monitoring program.

These two wells may represent a fraction of wells finished in unconsolidated sediments (sand and gravel to silt/clay) and wells finished in shallow bedrock (generally shale).

Location of the two DEC-USGS drought-monitoring program wells in Tompkins County

Tm 985 – Bedrock well in Genesee Shale. Located in the Cornell Research Park (airport) behind the former USGS office at 30 Brown Road.

Tm1968 – Unconsolidated sediment well, located 1 mile east of Slaterville Springs.



U.S. Geological Survey Climate Response Network Well Tm-985

(Located in the Cornell Research Park, at 30 Brown Road, Lansing, NY
behind building at northern end of 'T' intersection)

Well site name : Tm 985

Site ID: 422920076275301

Latitude: 42° 29' 20"

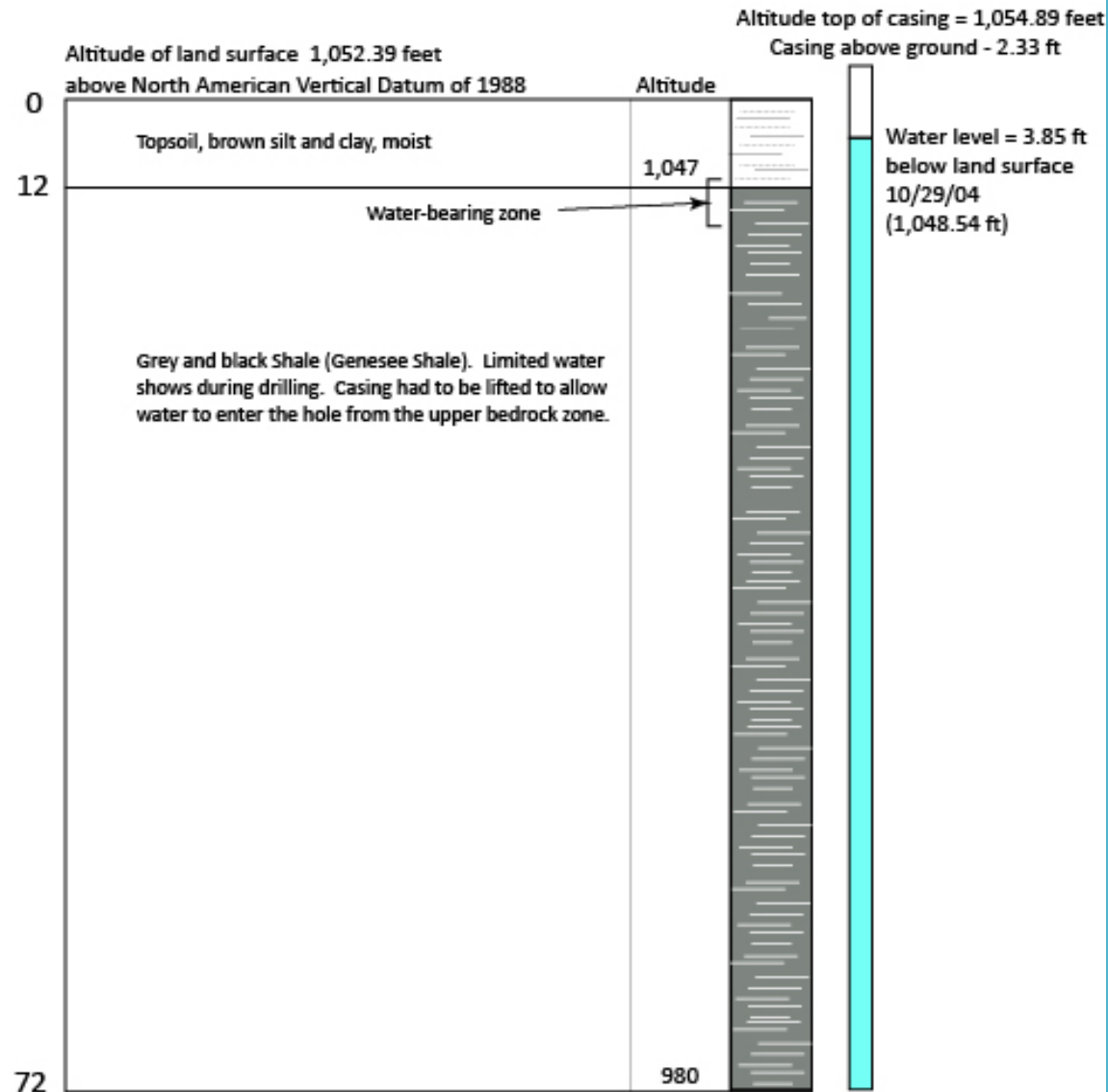
Longitude : 76° 27' 53"

Date Completed : 09/30/04

Drilling Contractor: Barber and DeLine, Tully, NY

Well Depth : 72 feet

Casing : 6-inch diameter steel casing

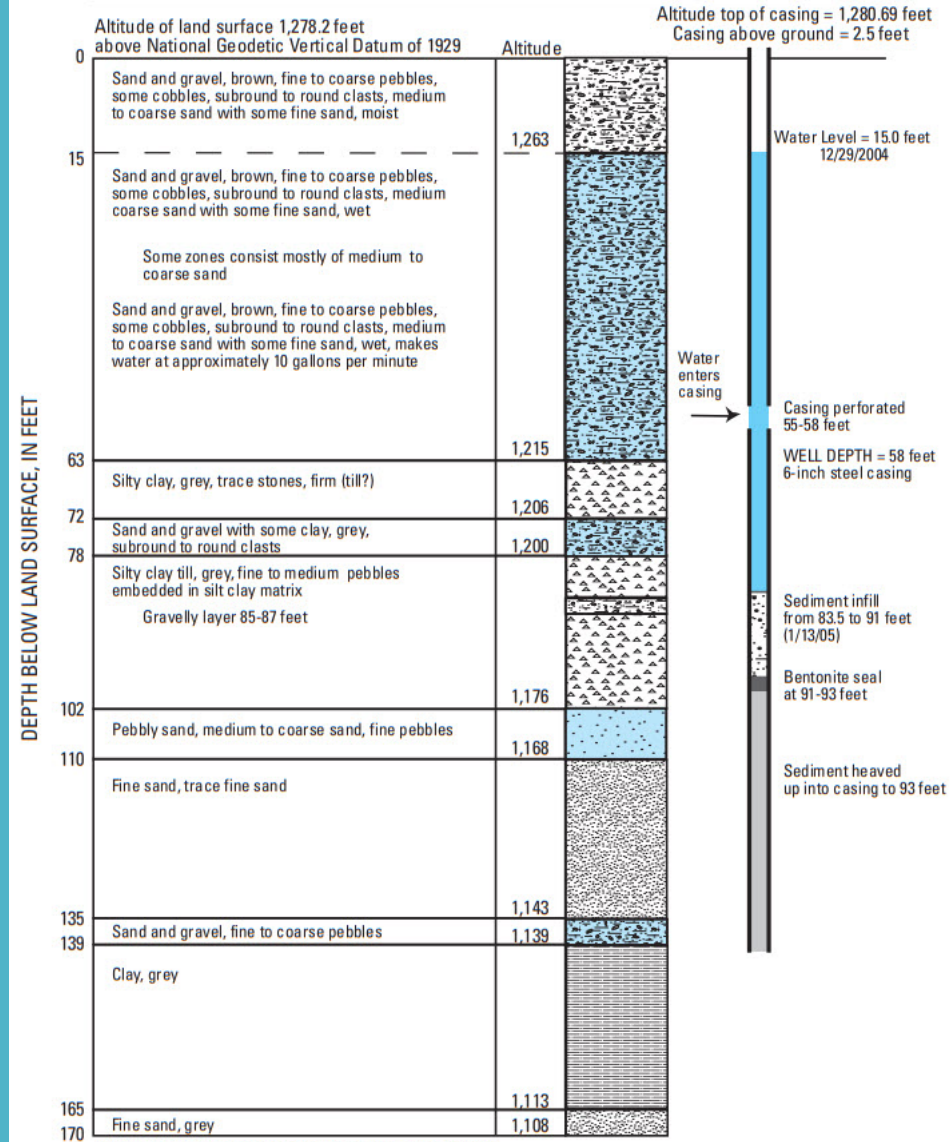


U.S. Geological Survey Climate Response Network Well TM1968

Well located 1 mile east of Slaterville Springs, NY

Well site name: **TM1968**
 Site ID: 422323076190301
 Latitude: 42° 23' 22.80"
 Longitude: 076° 19' 03.03"

Date completed: 12/29/04
 Drilling contractor: Barber & DeLine, Tully, NY
 Well depth: 58 feet (6-inch-diameter casing)
 Casing: 6-inch diameter steel casing



Developed well 30 minutes at 20 gallons per minute 12/29/04

This proposal suggests expanding the groundwater monitoring network to include other parts of the County, utilizing existing wells to further define water-level information within the County's various aquifers.

These wells can be from previous studies of groundwater contamination, unused domestic wells, former USGS study wells, but wells that are not influenced by nearby pumping. Town and County DPW's would be the most likely source of information about such wells.

Any additional wells to those in the DEC program would provide private well users with an idea of how their well might be affected by changes in water availability due to a more variable climate - especially precipitation.

The wells could also provide a means to monitor water-quality in these aquifers as affected by natural and anthropogenic sources of pollution – parameters such as: naturally-occurring arsenic in confined aquifers; petroleum or chemical surface spills; or bacteriological sources (septic or animal wastes).

Conceptual Costs for a County water-level and water-quality monitoring

Equipment – (Estimate ~\$7,000)

Water-level monitoring – using a sealed transducer on a Kevlar line (doesn't stretch over time) will also require one barometric transducer for the countywide system to remove barometric changes to the recorded well-water level. *(Software usually free and upgraded often)*

- Transducer ~ \$750 each
- Base station to allow communication between recovered transducer and laptop ~\$200
- Laptop computer (field rugged) – Supplied by an agency, shared by volunteers? If one not available ~\$1,500?
- Water-level tape – to measure current water level to assure transducer is correctly monitoring water-level ~\$350

Conceptual Costs for a County water-level and water-quality monitoring, cont.

Personnel, data management, serving data to the public

These costs are dependent on what agency would be responsible for collection, analysis, and distribution (serving) of the **water-level data** to the public via the internet. Reporting daily precipitation values would also be useful on the public website.

A County department? Personnel, vehicle, in office analysis, data storage, and serve data to the internet

A semi-volunteer group (such as CSI) – volunteers to collect, analyze, archive data, and serve the data to the internet.

Conceptual Costs for a County water-level and water-quality monitoring, cont.,

Personnel, laboratory analysis, data management, serving data to the public

These costs are dependent on the number of water-quality parameters to be investigated, what agency would be responsible for collection, laboratory analysis, and distribution (serving) of the **water-quality data** to the public via the internet.

A County department? Personnel, vehicle, field collection equipment, sample collection, lab analysis, archive data, and serve data to the internet.

A semi-volunteer group (such as CSI) – volunteers would need field equipment, collect water samples, perform laboratory analysis, archive data, and serve the data to the internet.

Conceptual Costs for a County water-level and water-quality monitoring, cont.,

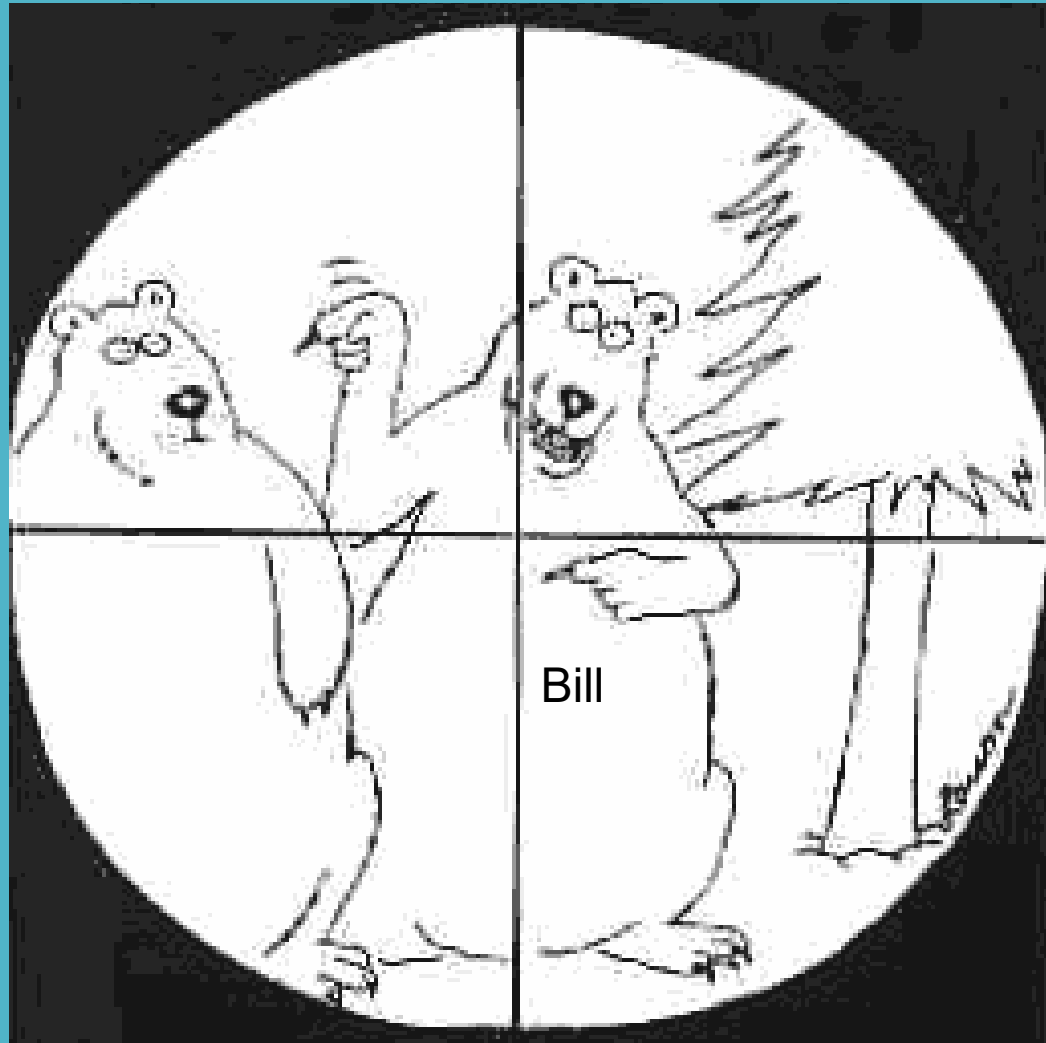
Who is going to fund such a project?

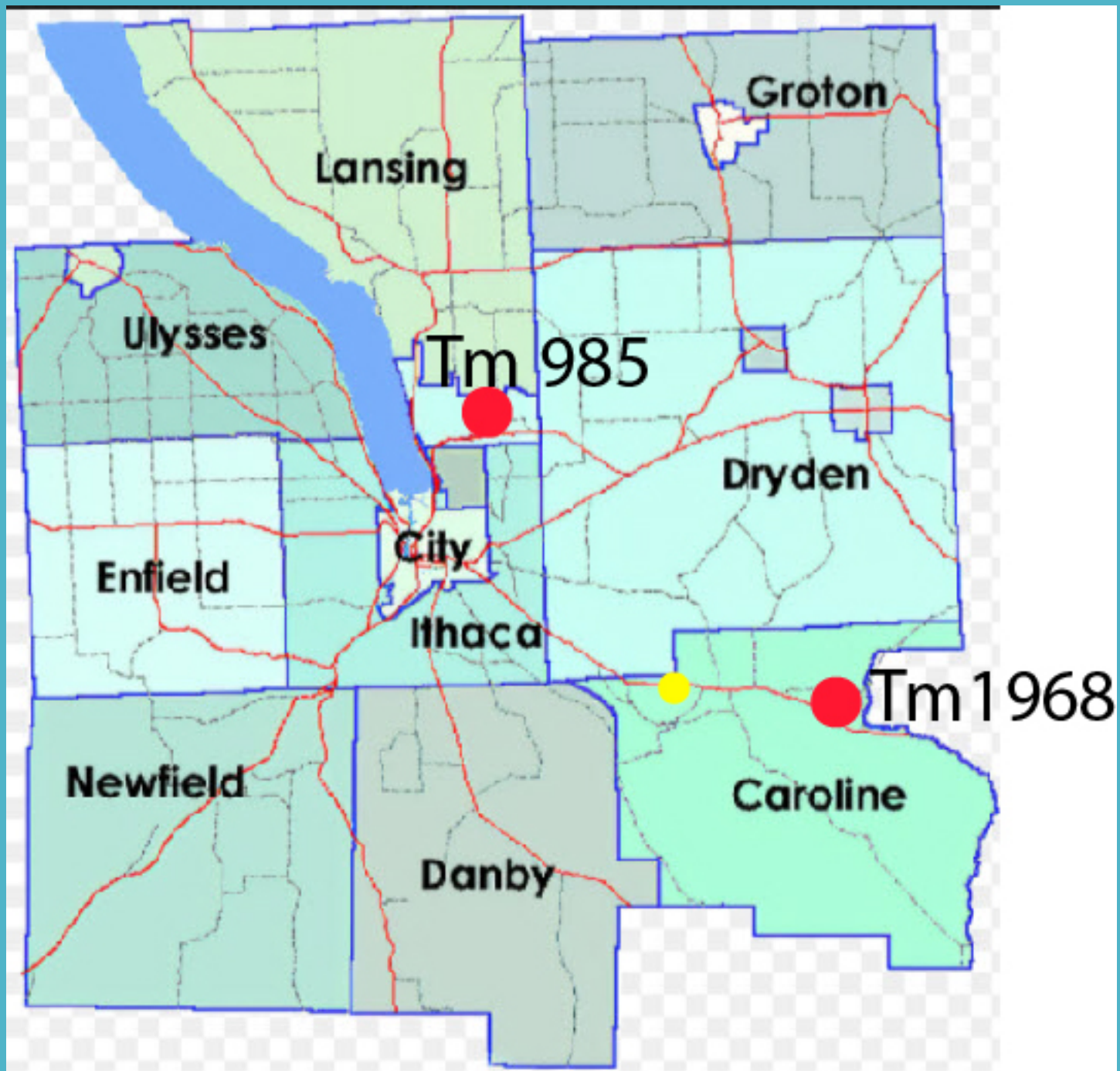
State or Federal funding sources focused on groundwater issues, site contamination fines, resource recovery funds?

The County, as a long-term program in addition to the Aquifer Studies program?

The Towns, each contributing an annual amount, and [or] if a concern within the town develops they would contribute more due to the local concern (water-quality issue, concern about a new groundwater withdrawal project)?

QUESTIONS?



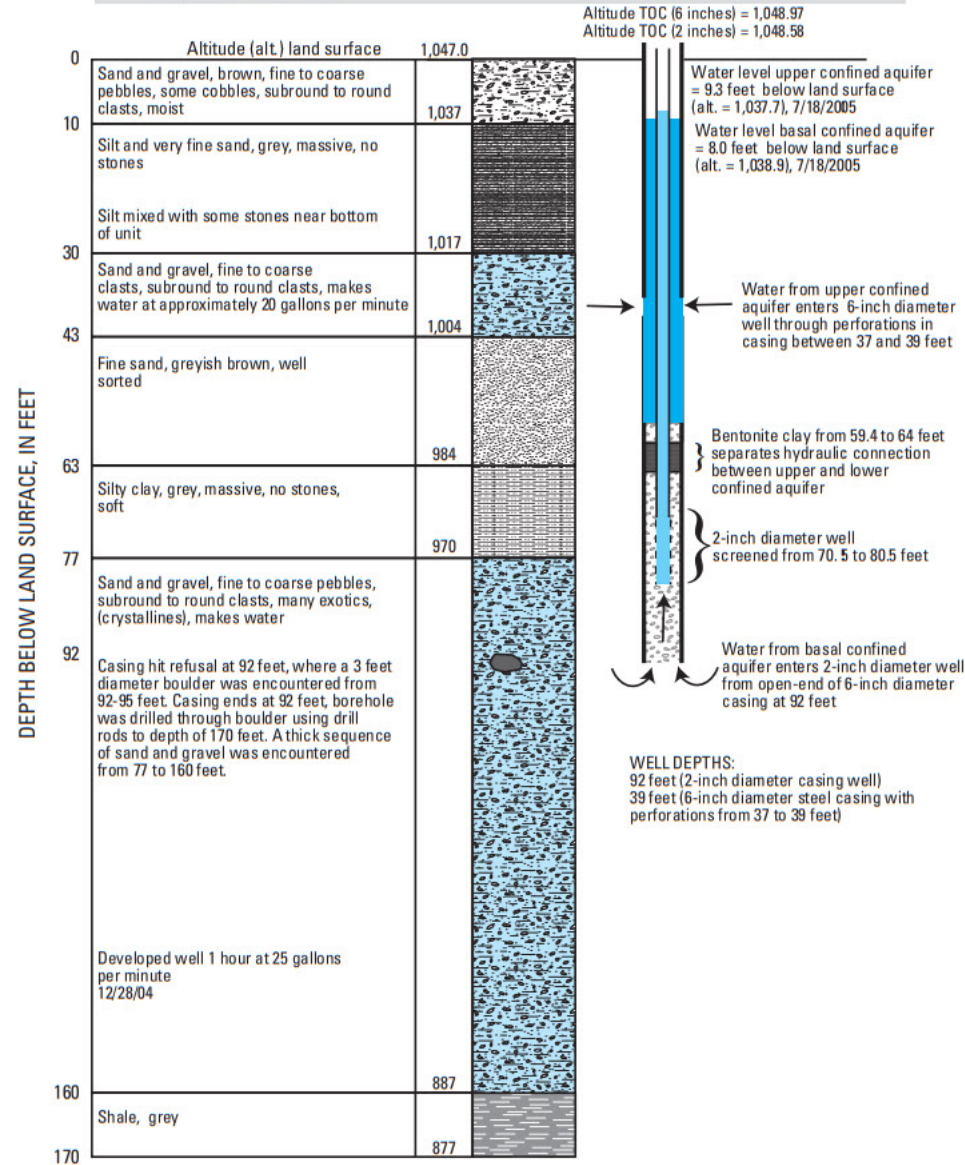


U.S. Geological Survey Test Wells **TM 994** and **TM1967**

Caroline Elementary School, Slaterville Springs, NY

Well site name: **TM1967**, depth = 92 feet
 Site ID: 422336076221301
 Site name: **TM 994**, depth = 39 feet
 Site ID: 422336076221302
 Latitude: 42° 23' 36.26"
 Longitude: 076° 22' 13.15"

Date completed: 12/28/04
 Drilling contractor: Barber & DeLine, Tully, NY
 Well **TM1967**: 2-inch diameter pvc casing,
 Well **TM 994**: 6-inch diameter steel casing)
 Casing above ground = 2.0 feet



USGS TEST WELLS TM1075 and TM 1076

Town of Enfield Highway Department, Town of Enfield, N.Y.

Site name: TM1075 (hole depth = 142 ft)

Date completed: 11/11&12/2015

Site name: TM1076 (hole depth = 60 ft)

Drilling contractor: Frey Well Drilling, Alden, NY

Site ID: 422504076373001 & 422504076373002

6-inch diameter steel casings

Latitude: 42° 25' 04.28"

Casing above ground = 3.1 ft Casing above ground = 3.7 ft

Longitude: 076° 37' 29.89"

Latitude and longitude measurement made by GPS (NAD83)

Elev. TOC (6 in.) = 1084.1 ft

Elev. TOC (6 in.) = 1084.7 ft

Water level 11-13-2015

Water level 11-13-2015

Altitude relative to NGVD 88

1069.6

1065.1

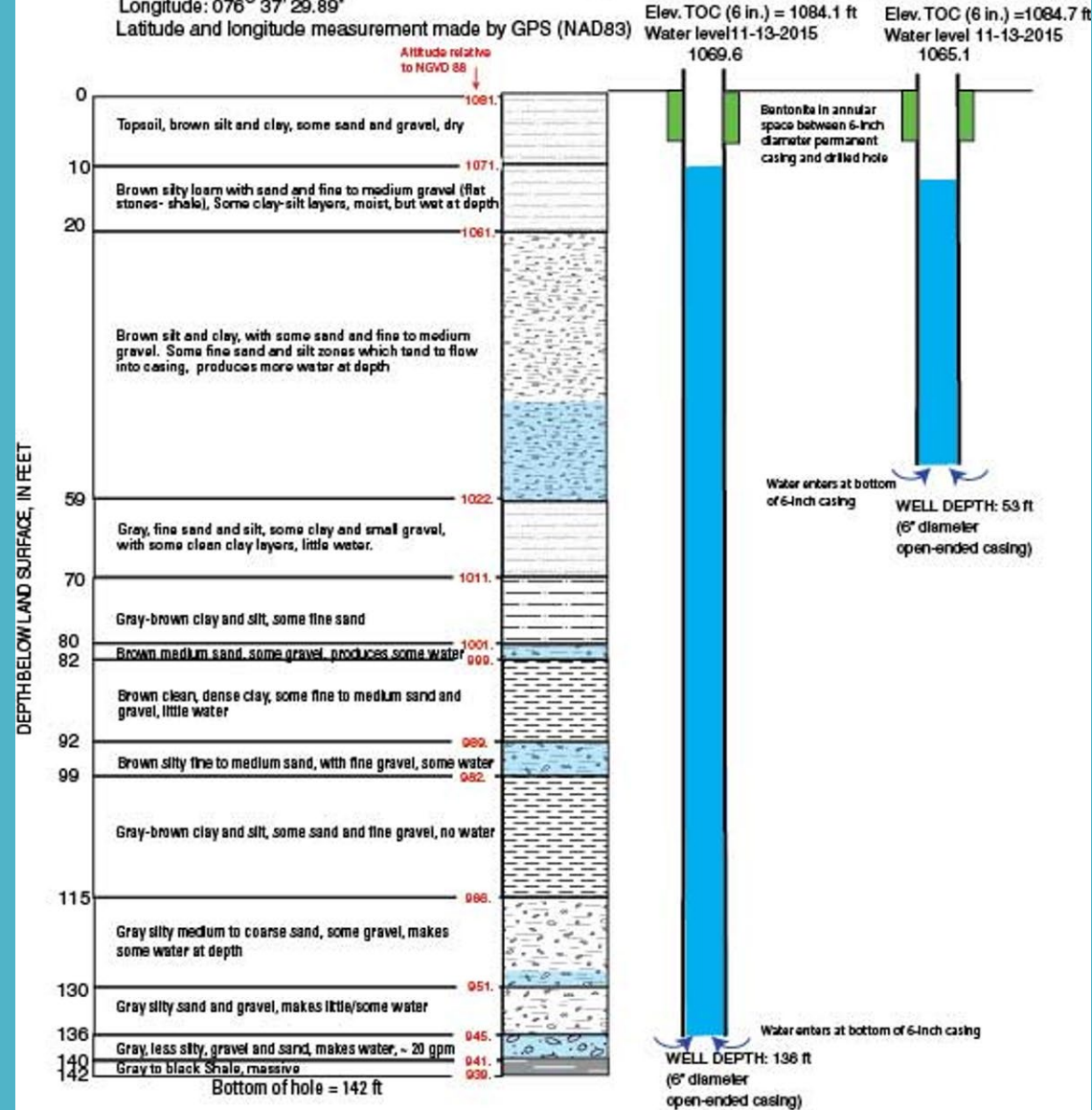


Figure —. Well log and well construction details of U.S. Geological Survey test wells TM1075 and TM1076 Enfield Department of Highway wells, off State Route 327, Town of Enfield, New York. Location of wells shown on figure —.

USGS TEST WELL - TM 418 and TM 923

Trumbulls Corners Road, Town of Newfield, N.Y.

Site name: TM 418/923 (well depth = 101 ft)
 Site ID: 422157076372501 - TM 418 - (78-77 ft)
 Site ID: 422157076372502 - TM 923 - (38-37 ft)
 Latitude: 42° 21' 57.35"
 Longitude: 076° 37' 25.01"

Date completed: 03/20/2015
 K-packer installed 05/21/2015 - separates perforation zones
 Drilling contractor: Frey Well Drilling, Alden, NY
 6 inch diameter steel casing
 Casing above ground = 3.9 ft

Latitude and longitude measurement made by GPS (NAD83)

Elev. TOC (6 in.) = 1193.9 ft

