

HYDROGEOLOGIC CORRELATIONS FOR SELECTED WELLS ON
LONG ISLAND, NEW YORK--

A data base with retrieval program

by H. T. Buxton, D. A. Smolensky, and P. K. Shernoff

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CONVERSION FACTORS AND ABBREVIATIONS

For the convenience of readers who prefer metric (International System) units to the inch-pound units in this report, the following conversion factors may be used:

<u>Multiply inch-pound units</u>	<u>by</u>	<u>To obtain metric units</u>
	<u>Length</u>	
inch (in)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	<u>Flow</u>	
gallon per minute (gal/min)	0.06308	liter per second (L/s)

National Geodetic Vertical Datum of 1929 (NGVD of 1929)

A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "mean sea level."

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ABSTRACT

Accurate delineation of Long Island's internal hydrogeologic structure is integral to the understanding and management of the ground-water system. The irregular extent and surface configuration of Long Island's seven major hydrogeologic units give the ground-water system a complex internal structure. This report presents a computerized data base of hydrogeologic correlations for 3,146 wells on Long Island and adjacent parts of New York City. The data base includes the well-identification number, the latitude and longitude of the well location, the altitude of land surface at the well, the altitude of the bottom of the drilled hole, and the altitude of the upper surface of the major hydrogeologic units penetrated by the well. A computer program is included that allows retrievals of selected types of data for all or any local area of Long Island. These data retrievals are a valuable aid to the construction of hydrogeologic-surface maps.

INTRODUCTION

Long Island extends approximately 120 mi eastward from the East River and New York Harbor to Montauk Point (fig. 1). It contains the densely populated boroughs of New York City (Kings and Queens Counties) in the west, suburban Nassau and western Suffolk Counties in the central part, and areas of farmlands and pine barrens in the east.

Ground water is the sole source of freshwater supply for the 2.6 million inhabitants of Nassau and Suffolk Counties. About 500 Mgal/d was pumped from the Island's ground-water reservoir in 1981 for public supply, commercial, and agricultural needs. This demand is expected to increase in coming years, which will make proper resource management imperative.

Long Island's geologic history has consisted of alternating periods of erosion and deposition. The result is a sequence of aquifers and confining units of irregular extent and surface configuration that give the ground-water system a complex internal structure. This irregular internal geometry has a large influence on the patterns and rates of ground-water flow. Ground-water flow is retarded where the aquifers are separated by a confining unit but is unimpeded where the intervening confining unit has been eroded or where cut-and-fill deposition makes two aquifers laterally contiguous.

Knowledge of the internal hydrogeologic structure is necessary for efficient resource management, which includes (1) designing future water-development plans; (2) selecting sites for waste disposal; (3) locating and tracking the movement of contaminants within the ground-water system; and (4) mitigating other undesirable effects of man's influence on the system, such as streamflow depletion and saltwater intrusion.

Purpose and Scope

This report presents a computerized data base of hydrogeologic-unit correlations for 3,146 wells on Long Island and adjacent parts of New York City. The data base (at end of report) gives the altitude at which the upper surface of each of seven major hydrogeologic units was penetrated and also includes the location, land-surface altitude, and depth of each well.

The following sections discuss the hydrogeologic units and the well data used to correlate surface altitudes for each unit; they also describe the format of the data base and explain each element. Also included is a description of a simple system of data retrieval that facilitates construction of hydrogeologic maps with a computer program.

A report by Smolensky and others (in press) presents a set of maps showing the configuration of the upper surface of these hydrogeologic units. The correlations presented herein were developed during construction of those maps and are consistent with their representation of the system geometry. The data-retrieval methods described in this report were used during map construction.

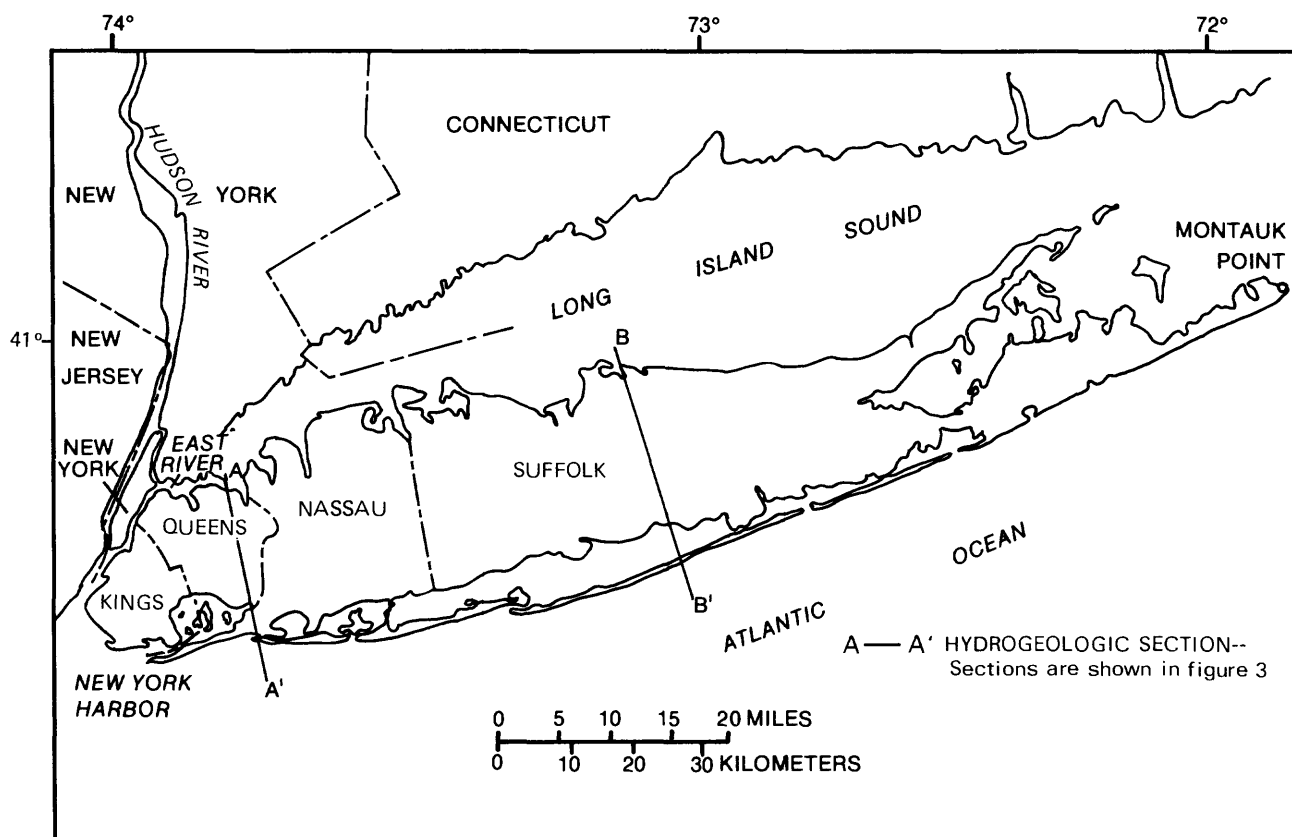


Figure 1.--Location of Long Island, N.Y., and of hydrogeologic sections depicted in figure 3.

Previous Investigations

Some previous hydrogeologic investigations that were completed on a local scale were used as a starting point for this study. Krulik (1981) and Jensen and Soren (1971) evaluated the hydrogeology of Suffolk County, Kilburn (1980) and Kilburn and Krulik (1986) evaluated the hydrogeology of parts of Nassau County, and Buxton and others (1981) evaluated the hydrogeology of Kings and Queens Counties.

Acknowledgments

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HYDROGEOLOGIC FRAMEWORK

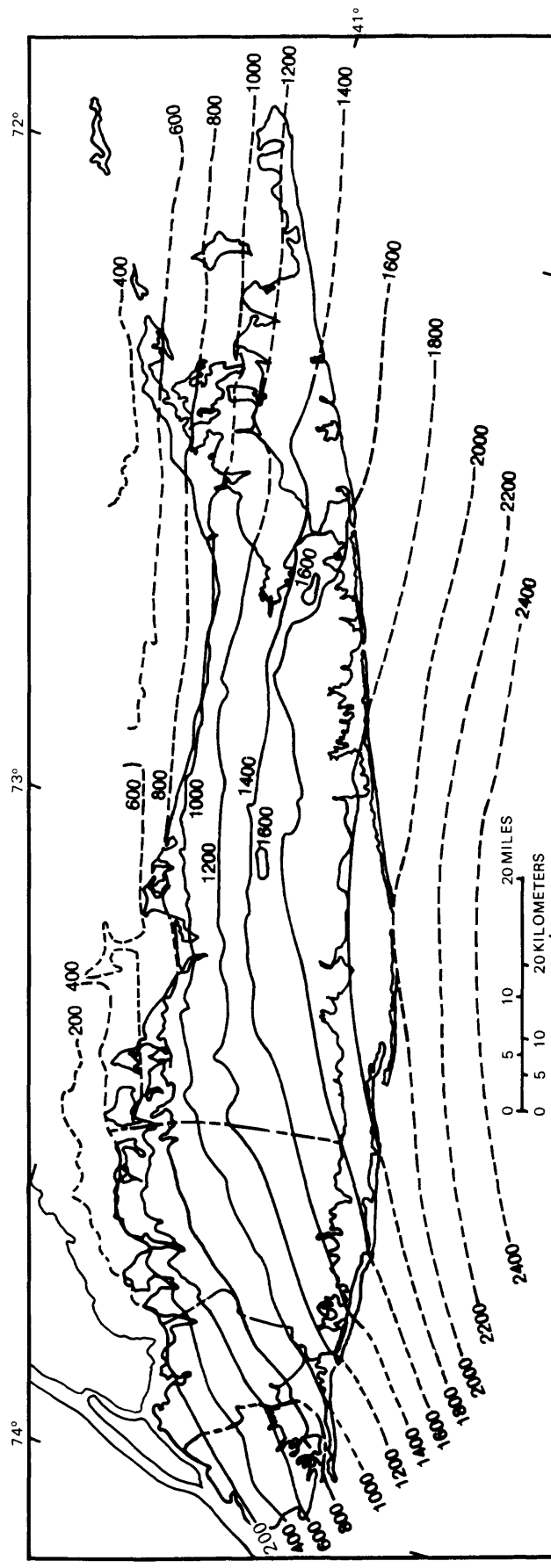
Long Island is underlain by unconsolidated deposits of clay, silt, sand, and gravel that overlie southward-dipping consolidated bedrock (fig. 2). The unconsolidated deposits are thinnest in northern Queens County (northwestern Long Island) and thicken to the south and east to a maximum thickness of 2,000 ft at the south shore. These deposits contain several distinct geologic units ranging in age from Late Cretaceous through Pleistocene, with some recent deposits near shores and along streams. These units are differentiated by age, method of deposition, and lithology in table 1.

In studies of ground-water availability and flow patterns, correlations that are based strictly on geologic factors may not adequately describe the internal structure of the hydrologic system; generally an interpretation in which the units are differentiated on the basis of water-transmitting properties is more useful. Thus, table 1 gives both the geologic units and the corresponding hydrogeologic units and shows their stratigraphic relationships. Eight major hydrogeologic units are indicated; these are, in order of deposition, consolidated bedrock, the Lloyd aquifer, the Raritan confining unit, the Magothy aquifer, the Monmouth greensand, the Jameco aquifer, the Gardiners Clay, and the upper glacial aquifer. The two hydrogeologic vertical sections shown in figure 3 depict the relative position of these units in western and eastern Long Island, respectively. The Jameco aquifer is present only in western Long Island (fig. 3A), and the Monmouth greensand is present only in eastern Long Island (fig. 3B). A map showing the extent and configuration of all units below the upper glacial aquifer is given in Smolensky and others (in press). Other local hydrogeologic units have been identified within the upper glacial deposits but are not discussed herein.

Table 1.--Hydrogeologic units of Long Island and their water-bearing properties.

System	Series	Geologic unit	Hydro-geologic unit	Approximate maximum thickness (ft)	Character of deposits	Water-bearing properties
Quaternary	Holocene	Recent deposits: Salt marsh deposits, stream alluvium, shoreline deposits, and fill.	Recent deposits	50	Sand, gravel, clay, silt, organic mud, peat, loam, and shells. Colors are gray, brown, green, black, and yellow.	Beach deposits are highly permeable; marsh deposits poorly permeable. Locally hydraulically connected to underlying aquifers.
		Upper Pleistocene deposits	Upper glacial aquifer	700	Till composed of clay, sand, gravel, and boulders, forms Harbor Hill and Ronkonkoma terminal moraines. Outwash deposits consist of quartzose sand, fine to very coarse, and gravel, pebble to boulder sized. Also contains lacustrine, marine, and reworked deposits. Local units are Port Washington aquifer and confining unit, "20-foot clay," and clay at Smithtown.	Till is poorly permeable. Outwash deposits are moderately to highly permeable. Glaciolacustrine and marine clay deposits are mostly poorly permeable but locally have thin, moderately permeable layers of sand and gravel. Average horizontal hydraulic conductivity is approximately 270 ft/d; is approximately 50 percent of outwash deposits; anisotropy is approximately 10:1.
	Pleistocene	unconformity?	Gardiners Clay	150	Clay, silt, and few layers of sand. Colors are grayish green and brown. Contains marine shells and glauconite.	Poorly permeable; constitutes a confining layer for underlying aquifer. Some sand lenses may be permeable. Average vertical hydraulic conductivity is approximately 0.001 ft/d.
		unconformity?	Jameco Gravel	200	Sand, fine to very coarse, and gravel to large-pebble size; few layers of clay and silt. Gravel is composed of crystalline and sedimentary rocks. Color is mostly brown.	Moderately to highly permeable. Confining overlying Gardiners Clay. Average horizontal hydraulic conductivity is 200 to 300 ft/d; anisotropy is approximately 10:1.
		unconformity?				

Cretaceous	Upper Cretaceous	unconformity	Monmouth Group	200	Interbedded marine deposits of clay, silt, and sand, dark-greenish gray, greenish-black, greenish, dark-gray, and black, containing much glauconite.	Poorly permeable; primarily a confining unit for underlying Magothy aquifer. Average vertical hydraulic conductivity is approximately 0.001 ft/d.
		unconformity	Matawan Group-Magothy Formation, undifferentiated	1,100	Sand, fine to medium, clayey in part; interbedded with lenses and layers of coarse sand and sandy and solid clay. Gravel is common in basal zone. Sand and gravel are quartzose. Lignite, pyrite, and iron oxide concretions are common. Colors are gray, white, red, brown, and yellow.	Most layers are poorly to moderately permeable; some are highly permeable locally. Water is unconfined in uppermost parts, elsewhere is confined. Constitutes principal aquifer for public supply. Average horizontal hydraulic conductivity is 50 ft/d; anisotropy is approximately 100:1.
		unconformity	Unnamed clay member	200	Clay, solid and silty; few lenses and layers of sand. Lignite and pyrite are common. Colors are gray, red, and white, commonly variegated.	Poorly to very poorly permeable; constitutes confining layer for underlying Lloyd aquifer. Average vertical hydraulic conductivity is approximately 0.001 ft/d.
		Raritan Formation	Lloyd Sand Member	500	Sand, fine to coarse, and gravel, commonly with clayey matrix; some lenses and layers of solid and silty clay; locally contains thin lignite layers. Sand and most of gravel are quartzose. Colors are yellow, gray, and white; clay is red locally.	Poorly to moderately permeable. Water is confined by overlying Raritan clay. Average horizontal hydraulic conductivity is 40 ft/d; anisotropy is approximately 10:1.
		unconformity	Bedrock	--	Crystalline metamorphic and igneous rocks; muscovite-biotite schist, gneiss, and granite. A soft, clayey zone of weathered bedrock locally is more than 70 ft thick.	Poorly permeable to virtually impermeable; constitutes lower boundary of ground-water reservoir. Some hard fresh water is contained in joints and fractures but is impractical to develop at most places.
		Bedrock	Bedrock	--		



Base from U.S. Geological Survey
State base map, 1:500,000, 1974

EXPLANATION

- 1000 ——— LINE OF EQUAL THICKNESS OF UNCONSOLIDATED DEPOSITS--
- Dashed where approximately located. Contour interval 200 feet

Figure 2. ---Thickness of unconsolidated deposits on Long Island.

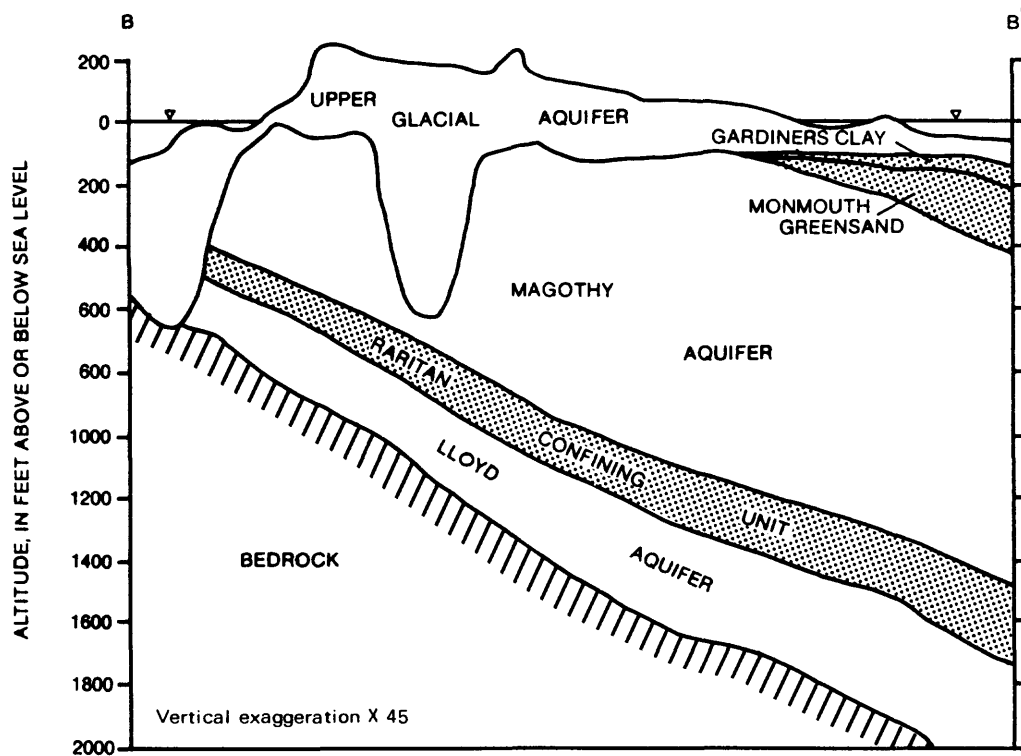
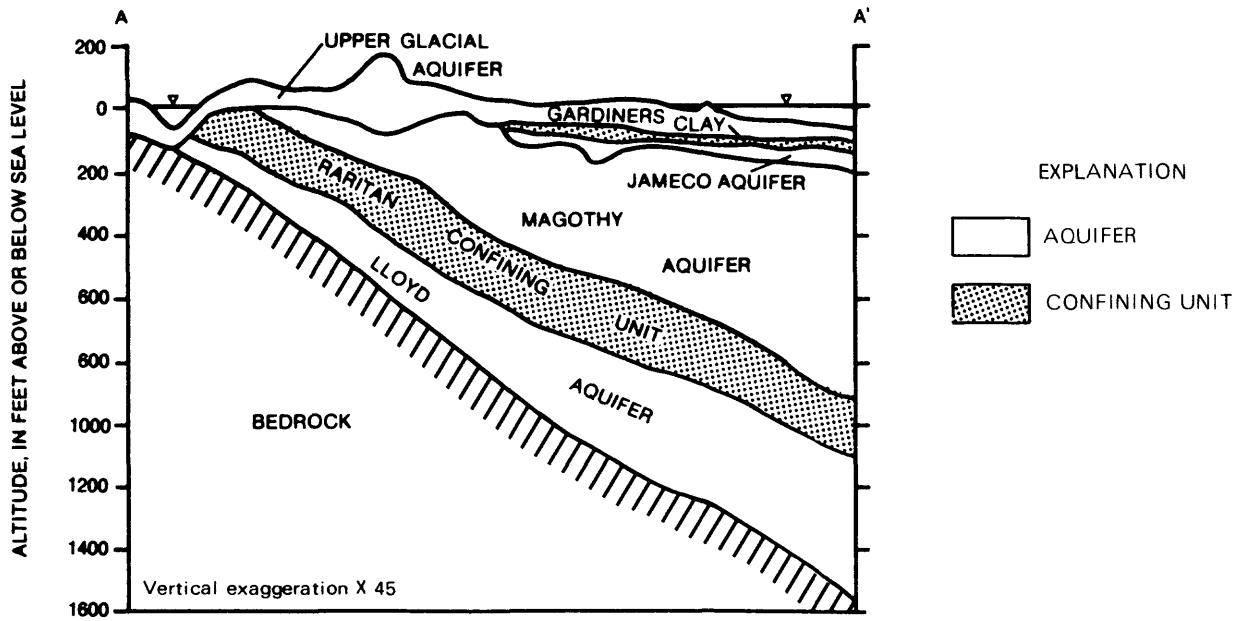


Figure 3.--Generalized vertical sections showing major hydrogeologic units:
 A. On western Long Island. B. On eastern Long Island.
 (Locations are shown in fig. 1.)

CRITERIA FOR HYDROGEOLOGIC INTERPRETATION OF WELL DATA

Hydrogeologic well data included geophysical logs and drillers' and geologists' descriptions of cores and other drilling samples. Lithologic, mineralogic, and paleontologic evidence from these sources was used in conjunction with a conceptual sedimentation model of the succession of physical environments through Long Island's geologic past to define the altitude of the upper surface of each major hydrogeologic unit penetrated by a well. Offshore seismic-reflection data (Grim and others, 1970, and Deborah Hutchinson, U.S. Geological Survey, written commun., 1984) were also considered. The surface altitudes of a unit at all wells were correlated to form a surface consistent with Long Island's geologic history.

ELEMENTS OF DATA BASE

Hydrogeologic well data from 3,146 wells throughout Long Island are given in the data base at the end of this report. These include 1,559 wells in Suffolk County, 830 wells in Nassau County, 462 wells in Queens County, 264 wells in Kings County, and 30 wells in the adjacent parts of New York City. The locations of wells in Kings, Queens, and Nassau Counties and adjacent areas are shown on plate 1; those in western Suffolk County on plate 2; and those in eastern Suffolk County on plate 3. All elements of the data base are explained in the following sections.

Well Identification

The State of New York requires that Long Island wells that pump more than 45 gal/min have a permit from the New York State Department of Environmental Conservation (NYSDEC). In the permit process, the well owner files an installation report with basic well data with NYSDEC, who assigns a well number. Other wells that are installed as geologic test holes or for collection of other forms of hydrologic data are reported voluntarily and filed.

The prefix letter of the well indicates the county in which the well is located, as follows: K, Kings; Q, Queens; R, Richmond (Staten Island); B, Bronx; M, New York (Manhattan); N, Nassau; and S, Suffolk. Wells are assigned numbers chronologically as they are reported.

Well Location

Each well has been plotted on U.S. Geological Survey 24-minute topographic maps, and the latitude and longitude estimated to the nearest second. A 5-second latitude-longitude grid is included on plates 1 through 3 to facilitate well location.

Well Altitudes

The altitude of land surface and of the bottom of the borehole is given in feet above or below (-) sea level. Many boreholes are significantly deeper than the completed well, and commonly the hydrogeologic information from the backfilled part of the hole is of value in that it indicates the presence or absence of a hydrogeologic unit at that depth.

Hydrogeologic Unit Penetrated and Altitude of Upper Surface

The altitude of the upper surface of any of the seven major hydrogeologic units penetrated by a well is given in feet above or below sea level. Altitudes facilitate correlation of these horizons among adjacent wells. In areas where the hydrogeologic unit is believed present but its exact surface altitude is difficult to identify, the term PRES (present) is entered. Where the unit is believed present but no drillers' log or other geologic information is available, the term NOREC (no record) is entered.

Adjacent Wells

Many wells are drilled in or near the same location; they may be clustered for site-specific projects or may be one of several grouped together in a well field. Only the most recent well at a location is labeled on plates 1 through 3; adjacent wells are included in the data base.

SELECTIVE DATA RETRIEVAL

Selective retrieval of information on individual hydrogeologic units is useful in defining the configuration and extent of a unit and its relationship to contiguous units. This section briefly describes a simple algorithm (and FORTRAN program, table 2) that retrieves selected information from the data base and prepares it in a form compatible with software available for plotting maps of Long Island (G. W. Hawkins, U.S. Geological Survey, written commun., 1984).

Program Documentation

A user can select pertinent information from nine fields in the data base. These nine fields along with a blank field are:

<u>Field</u>	<u>Information</u>
1	Well number
2	Altitude of hole bottom
3	Altitude of upper surface of Gardiners Clay
4	Altitude of upper surface of Jameco aquifer
5	Altitude of upper surface of Monmouth Greensand
6	Altitude of upper surface of Magothy aquifer
7	Altitude of upper surface of Raritan confining unit
8	Altitude of upper surface of Lloyd aquifer
9	Altitude of upper surface of consolidated bedrock
10	Blank field

The algorithm retrieves information from the selected field(s) and creates a file of labels. The file includes the latitude and longitude of the well for location, the symbol used for plotting the well on a map of Long Island, and the desired label to be plotted at each symbol (labels are selected from the above fields).

Table 2.--FORTRAN computer program for select

```

CHARACTER*6 NF(10),NA,NB,NC,NL
CHARACTER*1 NS,TEXTIN,NN
PRINT*, '*****'
PRINT*, '*** PROGRAM - HYDROGEOLOGY RETRIEVE(HGR.F77) ***'
PRINT*, '*** GENERATES A LABEL FILE (FOR MLILOT) ***'
PRINT*, '*** FROM THE HYDROGEOLOGY DATA BASE. ***'
PRINT*, '*****'
PRINT*, '***ENTER NAME OF HYDROGEOLOGY FILE'
CALL IFILE(15)
PRINT*, '***ENTER NAME OF LABEL CARDS FILE'
CALL OFILE(4,16)

```

C

```

PRINT*, '*****'
NCHOP=INTIN(' ***ENTER 0 FOR ISLAND-WIDE RETRIEVAL, 1 FOR LOCAL')
IF(NCHOP.EQ.0) GO TO 20
LNLAT=INTIN(' ***ENTER LAT OF NORTHERN EXTENT OF LOCAL AREA***')
LSLAT=INTIN(' ***ENTER LAT OF SOUTHERN EXTENT OF LOCAL AREA***')
LELONG=INTIN(' ***ENTER LONG OF EASTERN EXTENT OF LOCAL AREA***')
LWLONG=INTIN(' ***ENTER LONG OF WESTERN EXTENT OF LOCAL AREA***')

```

20 CONTINUE

C

```

PRINT*, '*****'
PRINT*, '*** THE DATA BASE HAS THE FOLLOWING ***'
PRINT*, '*** INFORMATION IN THE NOTED NUMBERED FIELDS. ***'
PRINT*, '*****'
PRINT*, '*** - 1- WELL NUMBERS ***'
PRINT*, '*** - 2- ALTITUDE OF HOLE BOTTOM ***'
PRINT*, '*** - 3- ALT. OF GARDINERS CLAY ***'
PRINT*, '*** - 4- ALT. OF JAMECO GRAVEL ***'
PRINT*, '*** - 5- ALT. OF MONMOUTH GREENSAND ***'
PRINT*, '*** - 6- ALT. OF MAGOTHY AQUIFER ***'
PRINT*, '*** - 7- ALT. OF RARITAN CONFINING UNIT ***'
PRINT*, '*** - 8- ALT. OF LLOYD AQUIFER ***'
PRINT*, '*** - 9- ALT. OF BEDROCK ***'
PRINT*, '*** -10- BLANK FIELD(NO LABEL IN OPTIONS) ***'
PRINT*, '*****'
NN=TEXTIN('ENTER C TO CONTINUE')
PRINT*, '*****'
PRINT*, '*** THREE OPTIONS ARE AVAILABLE ***'
PRINT*, '*** ----- ***'
PRINT*, '*** 1- LABEL WITH FIELD A IF: ***'
PRINT*, '*** FIELD B IS NOT BLANK. ***'
PRINT*, '*** 2- LABEL WITH FIELD A IF: ***'
PRINT*, '*** FIELD B IS BLANK ***'
PRINT*, '*** 3- LABEL WITH FIELD A IF: ***'
PRINT*, '*** FIELD B IS BLANK, AND ***'
PRINT*, '*** FIELD C IS NOT BLANK. ***'
NN=TEXTIN('ENTER C TO CONTINUE')
PRINT*, '*****'
PRINT*, '*** '
NOP=INTIN(' *** ENTER OPTION( 1,2 OR 3)***')

```

trieval of hydrogeologic data.

```
PRINT*, '*** '  
NS=TEXTIN(' ***ENTER SYMBOL FOR WELL POINT ***')  
PRINT*, '*** '  
C  
NF(10)=' '  
IA=INTIN(' ***ENTER FIELD FOR A ***')  
IB=INTIN(' ***ENTER FIELD FOR B ***')  
IF(NOP.NE.3) GO TO 15  
IC=INTIN(' ***ENTER FIELD FOR C ***')  
C  
15 PRINT*, '*****'  
PRINT*, '*** YOU HAVE THE OPTION TO HAVE THE INFO IN ***'  
PRINT*, '*** ONE OF THE FIELDS ADDED TO THE END OF ***'  
PRINT*, '*** THE LABEL CARDS FOR REFERENCE. ***'  
IL=INTIN(' *** ENTER FIELD # FOR EXTRA LABEL***')  
C  
C READ DATA FOR A WELL  
C  
10 READ(15,8,END=99)NF(1),LAT,LONG,(NF(I),I=2,9)  
8 FORMAT(A6,3X,I6,1X,I6,7X,A6,3X,A6,1X,A6,  
/ 1X,A6,1X,A6,1X,A6,1X,A6,1X,A6)  
C  
IF(NCHOP.EQ.0)GO TO 25  
IF(LAT.GT.LNLAT.OR.LAT.LT.LSLAT) GO TO 10  
IF(LONG.GT.LWLONG.OR.LONG.LT.LELONG) GO TO 10  
25 CONTINUE  
C  
C DEFINE FIELDS A,B,C AND L  
C  
NA=NF(IA)  
NB=NF(IB)  
IF(NOP.NE.3) GO TO 140  
NC=NF(IC)  
C  
140 CONTINUE  
NL=NF(IL)  
C  
GO TO (50,60,70),NOP  
50 IF(NB.NE.' ') GO TO 5  
GO TO 10  
60 IF(NB.EQ.' ') GO TO 5  
GO TO 10  
70 IF(NB.EQ.' '.AND.NC.NE.' ') GO TO 5  
GO TO 10  
C  
5 WRITE(16,9)NS,LAT,LONG,NA,NL  
9 FORMAT('L 0 ',A1,20X,I6,1X,I6,4X,A6,30X,A6)  
GO TO 10  
99 CONTINUE  
STOP  
END
```

One of three options can be selected:

- (1) Label with field A if field B is not blank,
- (2) Label with field A if field B is blank,
- (3) Label with field A if field B is blank, and field C is not blank,

where A, B, and C are defined to be one of the ten fields listed on page 9. Data can be retrieved on an islandwide scale or for a local area by defining limiting latitudes and longitudes.

Sample Retrievals

The options provided by this program enable the user to retrieve selected data and plot maps that are useful in defining hydrogeologic geometry, either on an islandwide or a local scale. Several examples of data retrievals are outlined below; an application to construct a hydrogeologic surface map is presented also.

Example 1.--Select option 1; designate field A equal to 1 (well number) and field B equal to 6 (altitude of the upper surface of the Magothy aquifer).

A file is prepared for use in plotting a map that shows the locations and well numbers of all wells that penetrate the Magothy aquifer. (If field A were designated equal to 6, the map would show the surface altitude of the Magothy aquifer at each well).

Example 2.--Select option 3; designate field A equal to 10, field B equal to 3, and field C equal to 6.

A file is prepared for use in plotting a map that identifies by a symbol each well that does not penetrate the Gardiners Clay but contacts the underlying Magothy aquifer. This indicates that the Gardiners Clay is absent at this site and provides a guide to defining the extent of that unit.

Example 3.--Select option 3; designate field A equal to 2, field B equal to 7, and field C equal to 6.

A file is prepared for use in plotting a map that shows the altitude of the bottom of all wells that penetrate the Magothy aquifer but not the underlying Raritan confining unit. The surface of the confining unit must be below this altitude.

An example of a hydrogeologic-unit map constructed with this data-retrieval system is shown in figure 4 (p. 14). This map shows the upper-surface configuration of the Raritan confining unit. All data on the map were retrieved from the data base through the discussed algorithm and are as follows:

- Upper surface altitude of the Raritan confining unit in wells where it is overlain by the Magothy aquifer, in feet. These values indicate the altitude of the unconformity between these units, a relatively flat surface.
- Upper surface altitude of the Raritan confining unit in wells where the Magothy aquifer is absent. These values indicate the altitude of the Cretaceous surface where it has experienced severe post-Cretaceous erosion, especially during the Pleistocene.
- Bottom altitude of wells that penetrate the Magothy aquifer but not the Raritan confining unit. These values indicate the highest possible surface altitude of the Raritan confining unit and are used to guide contours where wells are not deep enough to penetrate the unit.
- Locations of wells that do not penetrate the Raritan confining unit but do contact older and stratigraphically deeper hydrogeologic units (the Lloyd aquifer or unconsolidated bedrock), indicating that the Raritan confining unit is absent at this location.

When combined, these data are a valuable aid to defining the surface configuration of a hydrogeologic unit; they also facilitate definition of the extent of a hydrogeologic unit and differentiation of the parts of the surface that were shaped by differing geologic events or environments. Use of this data-retrieval method is most advantageous in areas where typically layered strata have been affected by severe erosion.

SUMMARY

The hydrogeologic data base and method of selective retrieval presented in this report offer a method to obtain hydrogeologic data for any local area on Long Island and provide the data in a format suitable for construction of hydrogeologic maps. The data represent the upper surface altitudes of the hydrogeologic units penetrated in 3,146 wells on Long Island and surrounding parts of New York City. The surface altitude of each hydrogeologic unit at a well was inferred through inspection of lithologic, mineralogic, paleontologic, and geophysical data collected from the well and by correlation of surface altitudes in nearby wells. The resulting series of correlated surface altitudes were used to define the surface configuration of the hydrogeologic units on a set of maps by Smolensky and others (in press).

As additional hydrogeologic data become available, reevaluation of correlations with nearby wells and concurrent adjustment of the data would be advisable so that the data base will accurately represent the hydrogeologic structure of Long Island's ground-water reservoir.

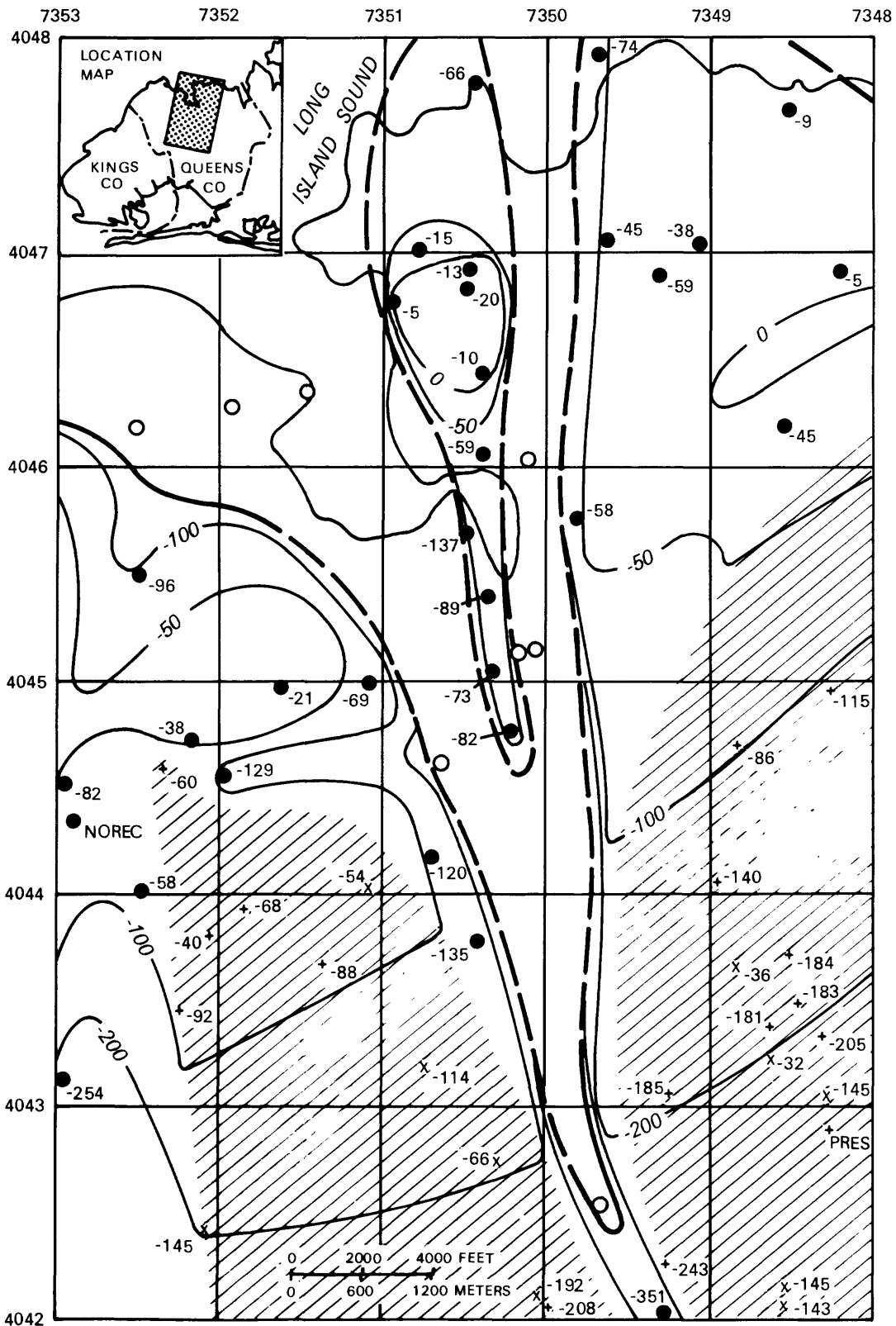



Figure 4.--Selected hydrogeologic data and estimated configuration of the upper surface of the Raritan confining unit in northern Queens County.

EXPLANATION TO FIGURE 4

- + -60 UPPER SURFACE ALTITUDE OF RARITAN CONFINING UNIT--where Magothy aquifer is overlying, in feet below NGVD of 1929.
- -38 UPPER SURFACE ALTITUDE OF RARITAN CONFINING UNIT--where Magothy aquifer was eroded away, in feet below NGVD of 1929.
- x -114 ALTITUDE OF BOTTOM OF WELL THAT CONTACTS MAGOTHY AQUIFER BUT NOT RARITAN CONFINING UNIT--in feet below NGVD of 1929.
- WELL THAT DOES NOT CONTACT RARITAN CONFINING UNIT BUT DOES CONTACT AN UNDERLYING UNIT.
- +PRES UNIT IS BELIEVED PRESENT BUT ITS SURFACE ALTITUDE IS UNDEFINED AT THIS WELL.
- NOREC NO BOREHOLE INFORMATION IS AVAILABLE IN THE INTERVAL WHERE THIS UNIT IS BELIEVED PRESENT.
- EXTENT OF RARITAN CONFINING UNIT.
- 50— LINE OF EQUAL UPPER SURFACE ALTITUDE--contour interval 50 and 100 feet. Datum is NGVD of 1929.
-  AREA WHERE RARITAN CONFINING UNIT IS UNCONFORMABLY OVERLAIN BY MAGOTHY AQUIFER.

4044. 7351 DEGREES AND MINUTES OF LATITUDE AND LONGITUDE, RESPECTIVELY.

REFERENCES CITED

- Buxton, H. T., Soren, Julian, Posner, Alex, and Shernoff, P. K., 1981, Reconnaissance of the ground-water resources of Kings and Queens Counties, New York: U.S. Geological Survey Open-File Report 81-1186, 59 p.
- Grim, M. S., Drake, C. L., and Heirtzler, J. R., 1970, Sub-bottom study of Long Island Sound: Geological Society of America Bulletin 81, p. 649-699.
- Jensen, H. M., and Soren, Julian, 1971, Hydrogeologic data from selected wells and test holes in Suffolk County, Long Island, New York: Long Island Water Resources Bulletin 3, 35 p.
- Kilburn, Chabot, 1980, Hydrogeology of the Town of North Hempstead, Nassau County, Long Island, New York: Long Island Water Resources Bulletin 12, 87 p.
- Kilburn, Chabot, and Krulik, R. K., Hydrogeology and ground-water quality of the northern part of the Town of Oyster Bay, Nassau County, New York, in 1980: U.S. Geological Survey Water-Resources Investigations Report 85-405 (in press).
- Krulik, R. K., 1981, Hydrogeologic data from selected wells and test holes in Suffolk County, Long Island, New York, 1972-80: U.S. Geological Survey Open-File Report 81-500, 27 p.

Smolensky, D. A., Buxton, H. T., and Shernoff, P. K., Hydrogeologic framework of Long Island, New York: U.S. Geological Survey Hydrologic Investigations Atlas HA-709, Scale 1:125,000 (in press).

Veatch, A. C., Slichter, C. S., Bowman, Isaiah, Crosby, W. O., and Horton, R. E., 1906, Underground water resources of Long Island, New York: U.S. Geological Survey Professional Paper 44, 394 p.

DATA BASE

Upper Surface Altitudes of Major Hydrogeologic Units at 3,146 Wells on Long Island, New York

(Locations are shown on plates 1, 2, 3)

NOTES

Well identification

Prefix letter (column 1) indicates county in which well is located:

K = Kings	B = Bronx
Q = Queens	M = New York (Manhattan)
S = Suffolk	N = Nassau
R = Richmond (Staten Island)	

Hydrogeologic unit penetrated

The term PRES (present) is entered for wells where the hydrogeologic unit is believed present but its surface altitude is difficult to identify. Where the unit is believed present but no drillers' log or other geologic information is available, the term NOREC (no record) is entered.

Other abbreviations

Mon. greensand	= Monmouth greensand
Rarit. conf. unit	= Raritan confining unit

Remarks

Veatch 65	- indicates well number used in Veatch (1906).
NR -10 to -30	- indicates no hydrogeologic records are available from 10 to 30 feet below sea level.

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS			
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF	LLOYD SAND	BED-ROCK					
B 1	404826 735000	2										-63		
B 2	404817 734958	0										-98		
B 3	404852 734909	9										-50		
B 4	405130 734616	10										-2		
B 39	404831 735005	2	-90									-63		
B 59	404820 735249	8	-80									-70		
B 69	404845 735210	0	-76									-71		
M 41	404240 740029	30	-46									-46		
M 114	404236 740037	30	-47									-47		
M 160	404705 735635	3	-146									-139		
M 161	404432 735915	30	7									16		
R A	403614 740310	0	-210		-124		-170					-190		BRIDGE BORING
R B	403609 740326	90	-216		-99							-163		BRIDGE BORING
R C	403834 740413											-115		
R D	403831 740440											100		R80
R 7	403753 740437	10	-40											
R 14	403734 740445	25	-18											
R 18	403659 740416	45	-97											
R 22	403700 740358	15	-162											
R 65	403506 740538	10	-77						-75			-162		
R 66	403529 740518	12	-87											
R 73	403730 740449	50	-30						-84			-30		
R 79	403815 740519	120	76									110		
R 80	403830 740441	110	73									106		
R 81	403831 740433	40	-9									6		
R 82	403443 740316	5	-1000							NOREC	NOREC			
R 89	403659 740409	25	-11											
R 91	403652 740404	25	-15											
R 93	403646 740359	25	-27											R94
R 94	403643 740357	25	-34											

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF AQUIFER	RARIT LLOYD AQUIFER	BED-ROCK			
K 465	404411 735706	10	-390	-149	-167		-198		-55			
K 514	403830 735545	26	-534	-146	-180		-197		-441			
K 515	403819 735624	20	-323	-100	-165		PRES					
K 517	403950 735709	78	-225	-157	-184		-215					
K 518	403815 735617	13	-317									
K 519	403936 735613	29	-221	-131	-157		PRES					
K 520	403951 735525	42	-376	-98	-131		-268				K533	
K 521	403849 735547	34	-396	-136	-179		-223					
K 522	403857 735721	50	-250	-91	-145		-240					
K 523	403754 735813	47	-488	-123	-153		-204					
K 524	403920 735551	33	-357	-146	-198		-254					
K 525	403818 735847	47	-353	-173	-217		-260					
K 526	403949 735737	82	-318	-146	-211						K531	
K 528	403921 735708	61	-310	-172	-195		-237					
K 529	403839 735847	62	-158	-151								
K 530	403818 735810	33	-127	-112								
K 531	403950 735740	82	-296	-146	-214							
K 532	403819 735654	11	-454	-146	-178		-199					
K 533	403954 735523	42	-353	-98	-131		-268					
K 534	403819 735644	17	-452	-150	PRES		PRES					
K 537	403851 735452	19	-194	-128	-164							
K 538	404015 735227	10	-162	-60	-112						K1286	
K 543	404107 735259	63	-222	-154	-218							
K 569	404304 735600	15	-175	-33								
K 579	404351 735635	7	-75				PRES					VEATCH 65
K 584	403742 740126	60	-85	-70								
K 611	404215 735805	10	-120	-92								
K 619	403929 735357	25	-426	-101	-120		-206					VEATCH 55
K 637	404226 735641	35	-177	-55			-114					
K 638	404022 735937	9	-166	-135	-136							K2533 K1332

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF UNIT	LLOYD AQUIFER	BED-ROCK			
K 1275	404202 735655	10	-165	PRES	-129		PRES				K3133	VEATCH 38
K 1283	404239 735632	45	-195									VEATCH 62
K 1286	404012 735229	10	-154	-60	-108						K1641	VEATCH 135
K 1287	403903 735734	50	-111								K1548	
K 1288	404143 735809	30	-78	-78								
K 1303	404258 735734	16	-74	-40							K2282	
K 1305	404200 735701	10	-156	-82	-112						K3133	
K 1309	403940 735458	30	-201	-124	-133							
K 1313	404148 735758	31	-130	-72					-129		K1340	
K 1319	404145 735757	31	-114	-72							K1340	
K 1322	403423 735954	5	-180	-119	-150				-180			
K 1332	404022 735937	10	-168	-121	-158							
K 1336	404204 735602	50	-113	-52							K2136	
K 1339	403941 735641	40	-129	-119								
K 1340	404145 735757	25	-120	-82					-120			
K 1343	403934 735539	39	-129	-123								
K 1344	404200 735701	10	-161	-85	-101						K1346	
K 1346	404232 735532	39	-129	-123							K3133	
K 1354	403911 735832	70	-110	-95								
K 1355	403905 735628	46	-129	-74							K1360	
K 1359	403908 735526	28	-177	-112								
K 1360	403904 735628	45	-90	-70								
K 1363	403923 735527	33	-137	-131								
K 1370	404338 735555	27	-50						-48			
K 1488	404147 735805	25	-83	-75								
K 1490	404229 735623	35	-100	-70								
K 1494	403841 740051	80	-164	-162								
K 1504	403928 735738	64	-116	-114								
K 1508	403912 735545	28	-118	-103								
K 1510	404003 735517	52	-153	-113								

K 1536	404033	735950	14	-142	-109	-122			
K 1548	404145	735804	38	-78	-78				
K 1558	403420	735925	5	-113					
K 1560	404334	735552	30	-71	-71				
K 1561	404111	740020	5	-55	-55				
K 1575	404211	735534	30	-55	-55				
K 1578	404058	735808	74	-129	-129				
K 1600	404202	735657	10	-147	-70	-101			K3133
K 1629	404201	735656	10	-160	-60	-90			K3133
K 1641	403900	735728	50	-154					
K 1662	404205	735740	6	-141	PRES				
K 1713	404046	735644	50	-132	-128				-122
K 1857	404014	735533	100	-118	-108				
K 1900	404028	740049	10	-125	-119				
K 1932	403831	735611	26	-125					
K 1977	404308	735547	15	-148					
K 1990	404234	735536	15	-55					
K 2044	404135	735919	48	-92					
K 2056	404120	740006	10	-75	-52	-61			-92
K 2059	403709	735923	38	-184	-139	-158			
K 2069	404202	735710	10	-167	-75	-123			-165
K 2070	403913	740053	18	-151	PRES	PRES			
K 2136	404204	735610	50	-62	-55				
K 2172	404144	735919	50	-66					
K 2173	404215	735816	5	-110					-110
K 2204	403634	735729	19	-171	-148	-154			
K 2227	404413	735726	10	-40					-40
K 2262	404257	735737	8	-53	-53				
K 2286	404158	735653	15	-175	-68	-98			
K 2326	403630	735519	15	-185	-181				
K 2342	403641	735510	5	-149	-149				
K 2434	404200	735659	10	-186	-72	-102			
K 2450	404033	735730	10	-91					
K 2488	403421	735826	10	-214	-148	-176			
K 2512	404009	735953	10	-142	-120	-129			
K 2513	404009	735953	10	-120	-109				
K 2533	404228	735639	30	-62	-49				
K 2556	404047	735716	65	-100					
K 2568	404223	735527	20	-80	-77				
K 2582	403732	735737	10	-186		-140			

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF LLOYD AQUIFER UNIT	RARIT SAND	BED-ROCK			
K 2859	403451 735856	10	-490	-160	-198	-292	-360	-458				
K 2860	403822 735255	10	-206	-163	-183							
K 3129	403748 735721	30	-240	PRES	-204						K3132	
K 3130	403748 735719	30	-258	-172	-206						K3132	
K 3131	403749 735716	30	-261	-160	-200							
K 3132	403750 735717	30	-280	-180	-215							
K 3133	404158 735658	15	-188	-83	-107							
K 3151	403921 735450	29	-232	-66	-103	-170	-220				K3184	
K 3176	403920 735446	29	-146	-47	-136						K3184	
K 3177	403921 735447	29	-146	-46	-131						K3184	
K 3178	403922 735448	29	-146	-43	-131						K3184	
K 3179	403923 735448	29	-146	-43	-136						K3184	
K 3180	403921 735446	29	-173	-56	-133	-143					K3184	
K 3181	403922 735446	29	-146	-54	-133						K3184	
K 3182	403923 735447	29	-146	-57	-138						K3184	
K 3183	403925 735449	29	-173	-56	-133	-143					K3184	
K 3184	403924 735447	29	-174	-42	-134	-142						
Q 13	404506 735554	24	-65									
Q 17	404427 735656	17	-158									
Q 27	404435 735221	57	-244	-10	-60	-190						
Q 29	404229 735202	80	-145	-96								
Q 31	404224 735133	70	-421	-84								
Q 33	404701 735049	27	-183	-120	-200	-360					Q455	
Q 37	404401 734659	72	-71									
Q 52	404207 735341	80	-70	-28								
Q 62	404502 735510	38	-91									
Q 64	404429 735257	35	-264	-80							Q268	
Q 65	404500 735106	20	-72	-69								
Q 95	404526 735611	20	-72									
Q 111	403635 734539	9	-1005	-160	-597	-808					Q1932	

Q 122	404428	735557	42	-83	-197	-242	-348	-455	-751		Q1516
Q 123	403503	734952	8	-952				-50			
Q 127	404539	734954	40	-160							
Q 161	404507	735711	5	-145							
Q 165	404529	735649	5	-200							
Q 171	404442	735618	46	-454							
Q 183	404646	735058	5	-165				5	-131		
Q 184	404414	735452	90	-492				-49			
Q 192	404337	735331	100	-73				0			
Q 206	404443	735409	47	-170				-95			QBWS4
Q 224	403953	734526	15	-473	-109			-423			Q878
Q 237	404113	735109	36	-541		-108		-262	-400		
Q 262	404527	735403	10	-217				-28			
Q 263	404500	735458	38	-87				-47			
Q 268	404421	735255	27	-270				NOREC			
Q 272	404302	734934	13	-482				PRES	-313		Q584
Q 273	404257	734937	26	-462				-131	-282		Q584
Q 274	404447	734759	20	-387				-148	-284		
Q 275	404543	734450	5	-451				-231	-355		Q276
Q 276	404511	734433	25	-506				-191	-371		
Q 278	404524	734438	16	-520				-196	-336		Q1057
Q 282	404448	734743	30	-433				-133	-277		Q283
Q 283	404450	734750	27	-420				-41	-123		
Q 287	403624	734916	5	-712	-150	-230		PRES	-655		
Q 290	403354	735326	5	-723	-195	-215		-280	-680		
Q 301	404214	734935	67	-43	-43						
Q 306	404147	734718	26	-71	-47						
Q 310	404141	734413	47	-64							
Q 311	404107	734805	28	-232	-100	-177					Q1939
Q 312	404044	734552	22	-254	-48	-148					Q2443
Q 314	404049	734752	35	-275	-81	-160					Q3157
Q 317	404154	734937	61	-639	-62	-202					
Q 318	404254	734813	131	-119							
Q 324	404155	734638	32	-91	-33						Q3156
Q 332	403943	734437	8	-367	-111						Q566
Q 333	403958	734502	12	-128	-49	-64					Q2137
Q 334	403952	734535	8	-182	-67						Q571
Q 335	404004	734620	13	-322	-70	-147					Q1197
Q 336	404016	734716	10	-163	-85	-135					Q1305
Q 337	404000	734742	8	-214	-106	-163					Q1876

NR -50 T0 -95

VEATCH 162
VEATCH 99
NR 27 T0 -265

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON SAND	RARIT MAGOTHY CONF AQUIFER UNIT	LLOYD AQUIFER UNIT	BED-ROCK			
Q 338	403957 734805	10	-220	-91	-195							
Q 339	404002 734830	10	-197	-103	-174						Q1175	
Q 340	404026 735135	9	-153	PRES	-71						Q634	
Q 341	404243 735134	70	-176									
Q 344	403959 735005	10	-326									
Q 345	404006 735040	10	-209									
Q 350	404020 735007	33	-622									
Q 364	404449 735333	63	-126									
Q 369	404438 735520	80	-72									
Q 374	404632 735530	33	-31									
Q 375	404633 735558	15	-43									
Q 376	404518 735521	43	-79									
Q 377	404539 735503	64	-23									
Q 378	404549 735455	75	-28									
Q 379	404529 735512	52	-95									
Q 380	404559 735447	78	-30									
Q 381	404647 735354	19	-76									
Q 382	404617 735429	58	-69									
Q 386	404451 735534	75	-147									
Q 387	404425 735539	64	-112									
Q 388	404433 735536	70	-133									
Q 389	404508 735529	35	-49									
Q 390	404351 735605	23	-188									
Q 391	404357 735557	62	-135									
Q 392	404403 735549	65	-101									
Q 393	404345 735557	17	-153									
Q 394	404411 735542	48	-127									
Q 395	404422 735704	7	-67									
Q 398	404437 735642	2	-65									
Q 399	404447 735653	13	-55									
Q 338												
Q 339												
Q 340												
Q 341												
Q 344												
Q 345												
Q 350												
Q 364												
Q 369												
Q 374												
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Q 386												
Q 387												
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Q 389												
Q 390												
Q 391												
Q 392												
Q 393												
Q 394												
Q 395												
Q 398												
Q 399												

Q 403	403352	735440	5	-865	-192	-206	-237	-486	-643	-865	
Q 404	404652	735517	43	-3						8	
Q 405	404702	735347	0	-95						-69	
Q 406	404646	735514	53	-29						-24	
Q 407	404623	735521	22	-28						-23	
Q 408	404610	735608	6	-51						-42	
Q 411	404609	735435	64	-61						-41	
Q 412	404549	735424	66	-62						-42	
Q 413	404612	735510	56	-55						-38	
Q 414	404618	735352	21	-102						-71	
Q 415	404629	735342	8	-102						-82	
Q 416	404646	735325	0	-143						-89	
Q 417	404522	735447	46	-75						-54	
Q 422	404430	735728	7	-59						-49	
Q 423	404435	735706	17	-52						-42	
Q 425	404444	735535	75	-84						-64	Q453
Q 426	404446	435500	63	-84				-32		-64	
Q 427	404436	735502	91	-136				-37		-121	
Q 428	404415	735507	98	-169				-86		-149	
Q 429	404407	735529	64	-170				-31		-150	
Q 431	404409	735503	104	-139				-71		-118	
Q 432	404401	735509	115	-187				-68		-167	
Q 434	404353	735508	89	-174				-30		-147	
Q 435	404346	735511	63	-196				-78		-176	
Q 436	404313	735526	8	-209	-57			-155		-187	
Q 437	404320	735501	5	-255	-97			-131		-207	Q1274
Q 438	404325	735514	4	-204	-95			-113		-184	
Q 439	404513	735056	10	-118							Q1028
Q 440	404446	735041	27	-94							Q2420
Q 441	404500	735023	2	-83							
Q 442	404459	734959	10	-84							
Q 443	404439	735049	27	-76							
Q 444	404435	735036	2	-80							Q1028
Q 446	404414	735047	2	-88							Q2400B
Q 447	404402	735039	2	-89							
Q 448	404320	735014	7	-53							
Q 449	404337	735017	1	-90							
Q 450	404545	735022	10	-72							
Q 451	404518	735038	17	-142							Q1730
Q 452	404504	735037	4	-87							

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF	RARIT LLOYD	BED-ROCK				
Q 453	404446 735535	68	-79									Q1098	
Q 455	404701 735048	37	-63									Q484	
Q 460	404541 734529	11	-446									Q484	
Q 461	404541 734529	11	-366									Q484	
Q 462	404541 734529	7	-398										
Q 464	404541 734529	6	-361									Q484	
Q 466	404541 734529	7	-384									Q484	
Q 468	404541 734529	2	-398									Q484	
Q 480	404541 734529	9	-381									Q484	
Q 484	404541 734529	7	-384										
Q 490	404704 734939	5	-219									Q495	
Q 491	404704 734939	9	-205									Q495	
Q 492	404704 734939	6	-222									Q495	
Q 493	404704 734939	7	-212									Q495	
Q 494	404704 734939	5	-213									Q495	
Q 495	404704 734939	4	-189										
Q 542	403453 734959	6	-391									Q1071	
Q 556	404200 734644	32	-391									Q571	
Q 557	404223 734800	58	-139									Q1507	
Q 558	404054 734917	33	-130										
Q 559	404021 734839	16	-281										
Q 561	404139 734715	25	-65									Q1839	
Q 562	404140 734716	23	-658										
Q 563	404302 734513	70	-68									Q564	
Q 564	404302 734513	70	-229										
Q 565	404202 734916	65	-495										
Q 566	404154 734937	61	-231										
Q 567	404254 734813	131	-504									Q2137	
Q 568	404200 734403	50	-819										
Q 571	404200 734644	30	-602										

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UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARDINERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF AQUIFER	RARIT LLOYD AQUIFER	BED-ROCK			
Q 2138	404208 735002	60	-63	-76	-183							Q2332
Q 2140	404124 734930	48	-274						-253			Q2189
Q 2144	404601 735011	12	-134						-16			Q2592
Q 2148	404452 735337	65	-20									
Q 2149	404126 734646	25	-75	-71								
Q 2188	404332 734429	90	-192	-80			-19					
Q 2189	404124 734930	48	-83									
Q 2195	404546 734949	25	-67						-58			
Q 2202	404312 735424	52	-193						-95		-193	Q2243
Q 2205	404117 734522	45	-351				-26					
Q 2206	404036 734436	25	-108	-48	-89		-105					
Q 2227	404056 734627	20	-399	-59	-208		-232					
Q 2243	404117 734522	45	-62				-3					
Q 2255	404224 734503	63	-290				-62					Q2300
Q 2259	404216 734423	55	-319				-45					Q2276
Q 2261	404404 735103	30	-54				-48					
Q 2266	403626 734457	22	-110									
Q 2272	404241 735359	95	-52									
Q 2273	404434 735156	30	-247						-154	-202	-234	Q2394
Q 2274	404740 734832	20	-148						-9	-109		
Q 2275	404216 734423	55	-50									Q2276
Q 2276	404216 734423	55	-319				-45					
Q 2280	404822 735129	8	-194								-192	
Q 2282	404733 734747	9	-188								-188	
Q 2289	404012 735006	30	-132		-103				-31	-129		Q2384
Q 2299	404224 734503	63	-100				-62					Q2300
Q 2300	404224 734503	63	-220				-62					Q2592
Q 2309	404602 735013	5	-123									Q2343
Q 2321	404245 734406	65	-309				-82					Q2332
Q 2325	404208 735002	60	-180	-76	-149		-180					

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS		
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	MAGOTHY CONF AQUIFER	RARIT UNIT AQUIFER	LLOYD AQUIFER	BED-ROCK				
Q 2435	404352 734449	160	-202											
Q 2437	404329 735214	80	-118											
Q 2443	404135 734402	47	-319											
Q 2445	404500 735606	26	-84											
Q 2468	404627 735024	10	-165											
Q 2588	404512 734456	90	-67											
Q 2592	404603 735008	12	-238											
Q 2600	404506 734613	65	-25											
Q 2685	404412 734538	105	-41											
Q 2706	404245 735017	110	-66											
Q 2712	404450 734402	185	-53											
Q 2721	404507 735620	35	-265											
Q 2765	404038 734450	25	-425											
Q 2791	404624 734835	80	-60											
Q 2837	404237 735136	60	-120		-80									
Q 2955	404040 734451	25	-430											
Q 2987	404515 734231	132	-327											
Q 2988	404402 734858	104	-360											
Q 2990	404129 734849	50	-264											
Q 2991	404310 734700	110	-404											
Q 3000	404413 734701	70	-209											
Q 3002	404610 734621	70	-47											
Q 3003	404515 734231	140	-183											
Q 3012	404310 734359	84	-42											
Q 3014	404310 734700	110	-227											
Q 3020	404340 734231	95	0											
Q 3026	404237 734554	60	-275											
Q 3029	404059 734508	25	-410											
Q 3030	404356 735151	18	-320											
Q 3036	404354 735200	20	-279											
Q 2435														
Q 2437														
Q 2443														
Q 2445														
Q 2468														
Q 2588														
Q 2592														
Q 2600														
Q 2685														
Q 2706														
Q 2712														
Q 2721														
Q 2765														
Q 2791														
Q 2837														
Q 2955														
Q 2987														
Q 2988														
Q 2990														
Q 2991														
Q 3000														
Q 3002														
Q 3003														
Q 3012														
Q 3014														
Q 3020														
Q 3026														
Q 3029														
Q 3030														
Q 3036														

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER	LLOYD AQUIFER	BED-ROCK				
N 31	4048000734429	9	-363					PRES	-355				
N 33	4050110734150	20	-352						-345				
N 36	4051110734302	46	-234						-199		N37		
N 37	4051130734302	52	-88						-166				
N 38	4051320734141	85	-337						-330				
N 41	4035360733936	6	-1251										
N 42	4035370733939	6	-1197										
N 43	4035310734012	6	-1279										
N 44	4035310734023	6	-1276										
N 45	4035360733943	6	-1127										
N 46	4035340733527	8	-1258										
N 47	4037170733916	6	-176										
N 48	4039240733917	17	-506										
N 50	4039230733916	16	-507										
N 52	4039290733826	27	-523										
N 54	4039320733749	28	-73										
N 57	4039130733717	11	-139										
N 62	4039050733615	10	-190										
N 67	4039220733535	24	-1028										
N 68	4039220733532	25	-527										
N 69	4039220733537	21	-484										
N 72	4041040733741	44	-572										
N 73	4040560733553	30	-686										
N 82	4043080733707	61	-481										
N 83	404306 733713	1	-1004										
N 87	4043240733755	1	-793										
N 93	4043520733831	75	-7										
N 97	4044480733812	114	-261										
N 98	4044460733813	114	-255										
N 101	4045210733534	108	-291										
N 31													
N 33													
N 36													
N 37													
N 38													
N 41													
N 42													
N 43													
N 44													
N 45													
N 46													
N 47													
N 48													
N 50													
N 52													
N 54													
N 57													
N 62													
N 67													
N 68													
N 69													
N 72													
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N 82													
N 83													
N 87													
N 93													
N 97													
N 98													
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N 31													
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N 57													
N 62													
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N 69													
N 72													
N 73													
N 82													
N 83													
N 87													
N 93													
N 97													
N 98													
N 101													

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER	LLLOYD AQUIFER	BED-ROCK				
N 1658	4044480732949	115	-185				67						
N 1667	4045240733532	108	-129				33					N7785	
N 1686	4047230734349	95	-255				30	-125				N5576	
N 1687	404723 734349	95	-130				PRES	-113				N5576	
N 1715	4049080734109	101	-419				-118	-165	-264	-397		N2030	
N 1716	4049110734111	101	-412				-115	-158	-254	-408			
N 1742	4039180733504	20	-252				-37						
N 1744	4039220734017	20	-57				-50						20FT -36
N 1771	4047430734034	212	-158				-149						
N 1793	404338 733307	91	-209				38						
N 1802	4045120734210	132	-618				9	-284	-427	-616			
N 1804	404528 734149	119	-137				1	-142	-290			N8373	
N 1805	4054270733112	15	-337				21						
N 1818	404532 734209	141	-94				9						
N 1819	4045140734150	117	-167										
N 1825	4047560733732	200	-167				82						
N 1835	404519 734210	122	-148				1						
N 1841	4045150734159	118	-141				8						
N 1869	4038470733302	10	-122				-42						
N 1877	4048100733912	20	-535				26	-240	-405				20FT -33
N 1917	4051380733824	15	-292					-150	-200				
N 1922	4045230732947	125	-66				63						
N 1926	404841 734533	51	-235										
N 1927	4035210733819	10	-1461			-89	-121	-859	-1051	-1461			
N 1939	4053140733155	5	-374					-169	-332				20FT -20
N 1940	4053000733250	20	-460					-190	-350				
N 1958	404426 734148	116	-641				16	-296	-491	-639			
N 2002	4049380733850	18	-454				-15	-229	-342				
N 2006	4041100734003	45	-18				-14						
N 2017	4053110733200	10	-385					-159	-325				

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER	LLOYD AQUIFER	BED-ROCK			
N 2790	40385050733953	3	-882	-57	-85	-684	-853	N7889		20FT	-37	
N 2921	4038450733850	8	-112	-57	-104							
N 3078	4037050733906	5	-141	-57	-99							
N 3147	4045460732841	121	-129		63							
N 3154	4044430733648	91	19		56							
N 3185	4044160733847	106	-393		-3							
N 3193	4043390733040	85	-235		11							
N 3245	4039140732645	5	-210		-66							
N 3312	4043100733029	70	-237	-55	7							
N 3325	4037420733433	5	-115		-63					20FT	-35	
N 3327	404033 734312	25	-545		-67	-432						
N 3355	4046180732704	183	-1065		17	-604	-775	N5145				
N 3443	404815 734345	124	-347		-32	-136	-256					
N 3444	4048450733441	263	-197		158		-339					
N 3448	403511 734150	7	-1243	-83	-123	-715	-990	N7446		20FT	-47	
N 3456	4043020733325	77	-552		17							
N 3465	4043050733331	80	-482		10							
N 3474	4048470733440	244	-395		107	-325						
N 3475	4048490733445	208	-279		44							
N 3479	4041170732944	30	-42		-31					20FT	-29	
N 3484	4045290733514	106	-59		77							
N 3488	4044450733104	117	-234		29							
N 3494	4044000733147	97	-553		2							
N 3519	4040300734146	19	-600		-33	-519						
N 3520	4041120733932	30	-445		-32							
N 3521	4048230734148	49	-357		-154	-169	-272					
N 3523	4048140734112	201	-383		-138	-199	-336			20FT	-34	
N 3529	4035200733932	10	-96		-94							
N 3569	4047510733045	181	-221		93					20FT	-22	
N 3581	4037410733912	8	-49	-48								

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER UNIT	LLOYD AQUIFER	BED-ROCK			
N 3892	4052330733724	145	-300						-171	-234	N5261	
N 3894	4040590733417	30	-385					-27				20FT -10
N 3895	4041190733231	40	-463					-51				
N 3905	404544 734151	134	-636					41	-254	-431	N8976 N4243	20FT -19
N 3926	4037250734304	14	-101			-55						
N 3937	4039570734017	25	-652					-29	-592			
N 3953	4046280733237	152	-362					23				
N 3982	4053150733342	20	-399						-149	-311		
N 4077	404324 734139	85	-453					PRES	-351			
N 4095	4046380732807	150	-377					76				
N 4097	4046310732939	158	-312					112				
N 4120	4040430734104	35	-423					-40			N6580	20FT -25
N 4128	4047330734146	137	-43					16				
N 4133	4048090733034	192	-253					-2				20FT -33
N 4149	4039050733242	5	-873					-44	-764			
N 4150	4038430733407	7	-819					-44	-745			20FT -29
N 4173	404526 734159	130	-130					12				
N 4208	4045240733632	106	-254					47				
N 4207	4045170734154	120	-125					18				
N 4215	4046330733759	132	28					36				
N 4223	4048550734034	192	-318					-148	-194	-311		
N 4243	404541 734152	132	-128					41				
N 4245	4047460733211	222	-349					72				
N 4246	4048020733128	200	-258					40				
N 4265	4047550733724	215	-275					19				
N 4266	404752 734403	57	-419						-155	-233		-348
N 4327	4046210733923	127	-303					36	-303			
N 4332	4047560733940	189	-21					113				
N 4334	4042110733832	65	-96					-13				
N 4376	4054450733112	58	-309						-110	-242		

N 4382	4045220733437	114	-106			54			N9062
N 4383	4045270733354	124	-12			82			
N 4388	4046460734403	28	-117			-26			N7445
N 4390	4045140734121	124	-177			9			
N 4400	4051540732958	36	-364			-177	-266		
N 4401	4041530732622	37	-684			-57			N9173
N 4405	403515 734305	9	-1108		-84	-141	-709	-865	N6701
N 4411	4039200734049	17	-551		-120	-58			
N 4425	4042590733715	60	-315			0			
N 4432	4051430733821	28	-324				-120	-272	N6549
N 4440	4051350733829	16	-300			-58	-119	-234	
N 4461	4040510732948	25	-617		PRES				N8837
N 4462	4050100733849	69	-202			PRES			
N 4512	4040580734108	35	-487			-28	-470		
N 4623	4047220733948	257	-246			67	-244		
N 4633	4047210733322	176	-132			19			
N 4714	403802 734444		-228		-150				VEATCH 272
N 4756	4042060733452	61	-847			4	-575	-755	
N 4772	4044370733743	109	-129			30			
N 4859	4050100734142	30	-369					-353	
N 4875	4037490734236	25	-123		-57	-112			
N 5007	4045520733420	119	-140			99			N7353
N 5058	4048480733407	238	-17			170			
N 5071	4052130733655	143	-99			48			
N 5074	4047000734350	81	-39			-39			
N 5076	404238 734203	71	-392			-31	-392		
N 5079	4037420734052	15	-138		-97	-122			
N 5099	404647 734235	189	-245			-50	-199		
N 5110	404629 734213	82	-324			-63	-188		
N 5121	4039580734103	26	-521			-62			N8251
N 5129	4036060733030	9	-1094		-52	-90	-990		
N 5135	4047320734304	135	-29			99			
N 5145	4040310734310	30	-474			-57			
N 5149	4045560733045	147	-45			39			
N 5153	4039420733644	25	-330			-25			
N 5167	4040410733438	35	-579			-18			
N 5188	4053500733124	22	-353				-178	-338	
N 5193	4039290733821	27	-528			PRES			N9792
N 5194	4039230733922	16	-504		PRES	PRES			
N 5201	4049250733817	48	-461			-292		-376	

N 5696	4039450733415	20	-545	-35		
N 5705	4045380732652	145	-368	95		
N 5708	4048240733806	211	-32	-3		
N 5710	4045590734155	179	-211	59		
N 5731	403944 734319	15	-87	-58		20FT -34,-48
N 5762	4051290733615	145	-165	-19	-135	
N 5768	4035210733739	5	-845	-127		
N 5777	4039400732930	5	-78	-62		20FT -30
N 5851	4047140733420	218	41	90		
N 5852	4048080733746	235	-282	50	-265	
N 5876	4048580734115	100	-195	-118	-168	
N 5883	4048200733814	208	-7	6		
N 5884	404756 734258	68	-160	36	-95	
N 5901	4047310733105	179	31	103		
N 5906	4038330733555	10	-101	-42		20FT -28
N 5947	4046460733908	129	-375	80	-282	
N 5994	4052110733718	130	-110	25	-102	
N 6034	4047430734022	210	-97	-17		N6395
N 6035	4047450734012	198	-96	81		
N 6046	4044170733551	101	-255	39		
N 6062	4039130732920	6	-82	-58		
N 6073	4045110734128	120	14	14		
N 6076	4046500732911	158	-536	86	-512	
N 6077	4046490732910	158	-534	86	-515	
N 6092	4049120732751	241	-396	191		
N 6093	4049080732751	240	-366	141		
N 6119	4046090733929	123	-58	41		
N 6148	4042160732733	50	-516	-40		
N 6149	4042120732621	47	-670	-48		
N 6150	4042450732903	59	-645	-20		20FT -23
N 6190	4047070733053	177	-465	-41	-456	
N 6191	4047070733049	180	-496	-1	-482	
N 6192	4045160733100	127	-530	25		N6191
N 6193	4045170733105	130	-607	26	-574	N9180
N 6202	4045490733305	132	-132	37		N9180
N 6205	4044250733813	107	-161	4		N7849
N 6224	4054390733048	30	-322		-115	N9464
N 6282	4051250734207	102	-340		-278	
N 6289	4051220733517	162	-223		-318	
N 6312	4054360733120	38	-302		-220	N6578
					-256	

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF	LLOYD AQUIFER	BED-ROCK				
N 5227	4035320733533	10	-1278	-39				-87	-899	-1089		N6850	20FT -39
N 5228	4048290733951	158	-176					-35					20FT -28
N 5233	4035220733621	12	-537	-49				-78					20FT -27
N 5260	4041330733834	55	-463					-41					
N 5261	4052330733722	145	-157						-105				
N 5292	4038050733453	5	-87					-46					20FT -39
N 5301	4044280733152	107	-397					27					
N 5302	4042460733143	65	-425					-49					
N 5303	4042530733006	60	-455					-7					
N 5304	4042250733043	55	-448					-35					
N 5308	4035190733628	8	-1240	-102				-142	-840	-1020			
N 5335	4047130733145	170	26					112					
N 5336	4044410733207	114	-556					21	-542		-263		
N 5357	4049370734420	20	-263										
N 5368	4045260733015	130	-20					44					
N 5484	4044190733644	90	-489					30	-460				
N 5485	4044230733655	92	-465					21	-459				
N 5486	4044150733655	89	-934					39	-470	-630			
N 5524	4038260734429	5	-139	-92			-126						
N 5528	4047280734005	257	-258					62	-238				
N 5530	4049420734144	65	-371							-255	-365		
N 5535	4046180734141	250	-185					49					
N 5576	404722 734348	95	-171					29	-110				
N 5596	4044530733725	106	-362					20					
N 5603	4045170734023	114	-338					55	-303				
N 5621	4048570734115	100	-180					-117	-169			N5876	
N 5654	4044510733526	102	-233					54					
N 5655	4045410733335	130	-130					44					
N 5677	4046410733047	218	-211					139					
N 5695	4039220733543	24	-505					-34					

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON SAND	GREEN SAND	MAGOTHY CONF AQUIFER	LLOYD AQUIFER	BED-ROCK			
N 6315	4045260733626	104	-251					41					
N 6334	4044540734104	128	-80					24					
N 6354	4037120733008	10	-104	-57		-68		-94					
N 6355	4036440733305	5	-125	-52				-65					
N 6376	4046330732706	200	-47					72					
N 6383	4041230732852	31	-653					-31				N6442	
N 6394	4047460734010	190	-27					116				N6395	
N 6395	4047470734010	190	-18					115					
N 6416	4051330733818	15	-280					-150	-236				
N 6435	4053280733126	58	-380					-154	-307				
N 6437	4042090733821	65	-226					-14					
N 6442	4041230732853	31	-581					-42					
N 6444	4050310733535	170	-87					80					
N 6450	4035330734011	10	-1321					-97	-815	-950			
N 6455	4039420734245	15	-69					-46					
N 6467	403810 734331	4	-694	-55	-132			-191	-571				20FT -21, -36
N 6468	403840 734330	5	-699	-52	-134			-230	-530				20FT -29, -33
N 6469	403810 734313	6	-597	-66	-131			-150	-569				20FT -7, -26
N 6510	403642 734333	10	-453	-88	-155			-154			N6610		
N 6549	4051440733824	32	-409					-177	-223	-404			
N 6578	4054330733122	20	-311						-156	-260			
N 6580	4046300732937	160	-542					100	-524				
N 6581	403827 734250	8	-612	-61	-131			-207	-579				
N 6610	403641 734331	9	-235	-79	-100			-121					20FT -24, -40
N 6623	4039070733532	20	-118					-52					
N 6631	4043440732841	87	-500					23			N8004		
N 6636	4043190732656	60	-140					-30					
N 6644	4044100732710	90	-148					14					
N 6651	4047540733157	225	-395					62	-385				
N 6655	4045340733244	122	-114					57			N8880		

N 6657	4036310732552	5	-406	-53	-84	-179				20FT	-46
N 6660	4039180733639	15	-73			-25				20FT	-22
N 6675	4053330733032	7	-453					-431			
N 6691	4046460733657	145	42			42					
N 6701	403517 734306	11	-846	-77	-133	-149	-716				
N 6706	403713 734159	6	-737	-68	-125	-155	-628			20FT	-19,-33
N 6721	4046570733819	148	29			30					
N 6741	4047510733045	180	-243			67					
N 6757	4038550733248	5	-66	-46		-51				20FT	-21
N 6791	4037280733930	5	-73	-50							
N 6806	4050260733616	154	-169			69					
N 6813	4039360734309	10	-228			-69					
N 6817	4039300733817	28	-550	-36		-64			N9792		
N 6819	4045370733335	130	-132			34					
N 6834	4040390732836	25	-678			-48			N6866	20FT	-28
N 6842	404420733610	104	-54			40					
N 6848	4044450733326	110	-2			2					
N 6850	4035330733532	7	-1043	-46		-87	-908				
N 6865	4044330734025	87	-214			11			N6918		
N 6866	4040390732835	26	-600			PRES					
N 6873	4053310733114	30	-360				-176	-339			
N 6893	4040490733543	40	-524			-15					
N 6904	404390733040	91	-602			18			N7076		
N 6907	4046360733641	138	4			55			N7936		
N 6915	4044010732832	90	-496			36			N6916		
N 6916	4043580732831	91	-522			48					
N 6918	4044330734027	87	-216			2					
N 6925	404750 734446	11	-274								
N 6928	4038050733953	6	-852	?		-85	-159	-190			
N 6945	4045470734011	154	-360			81	-685	-841	N7889		
N 6956	4045570732705	170	-484			38			N8595	20FT	-29
N 6965	4037570734039	5	-132	-86	-103						
N 6972	4047060734400	78	-48			-26					
N 6992	4040510732721	24	-87	-44		-69					
N 6996	4045280733040	132	12			21				20FT	-35
N 7022	4042000733500	60	-4			-4					
N 7030	4046370733305	160	-378			-3					
N 7045	4047290733423	241	90			91					
N 7047	4051530733326	223	-41			83					
N 7053	4046280734058	209	-77			72					
N 7076	4043390733040	91	-583			20					
N 7087	4047060734337	98	-105			-13					
N 7104	4046320733722	158	-314			68		-272			
N 7114	4037530733736	9	-193			-39				20FT	-31
N 7115	4050290733317	205	-69			-10					

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS		
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER UNIT	LLLOYD AQUIFER	BED-ROCK					
N 7773	4050100733059	230	-335						-136					
N 7776	4035370733940	5	-1233						-123		-817	-980		
N 7781	4047510733220	217	-333						91					
N 7782	4051420733714	95	-133						24		-133			
N 7785	4045260733534	108	-296						54					
N 7795	4040230733709	40	-720						-23		-665			
N 7796	4039490733417	11	-689						-51					
N 7830	4051110733258	118	-79						83					
N 7849	4044230733806	106	-145						23					
N 7852	4044110732616	75	-540						-23					
N 7854	4040350734035	35	-637						-18		-587			
N 7855	4040400734036	37	-568						-16					
N 7857	4050590733841	195	-432								-171	-275	-432	
N 7858	4048110733321	218	-157						33					
N 7873	4048110733633	253	-282						135					
N 7884	4038030733953	7	-736								-685			N7889
N 7885	4038030733954	7	-725						-40					N7889
N 7886	4038030733954	7	-595						-47					N7889
N 7887	4038030733954	7	-638						-41					N7889
N 7889	4038020733954	7	-595						-43					N7889
N 7892	4046510734009	200	-255						-45					
N 7936	4046360733641	138	-5						101		-252			
N 7957	4044190733531	98	-527						70					
N 7980	4047160733711	161	6						30		-488			
N 8004	4043450732840	85	-663						60					
N 8007	4045430733549	120	-458						30		-654			
N 8008	4039130733211	10	-383						64		-450			
N 8010	4047390733921	225	-228						-51					
N 8031	4040390733115	25	-498						131		-224			
N 8037	4043590733146	97	-587						-39					
									1					N8321
														20FT -30

N 8038	4045450734255	210	-85			104						
N 8043	4047540732831	222	-499			132	-484					
N 8048	4051520733819	60	-310				-184	-240				
N 8095	4049140733924	35	-365				-258	-331	N8608			
N 8096	4049170733924	27	-383					-347	N8608			
N 8109	4038440734233	5	-148	-52		-147				20FT	-28	
N 8123	4050490733035	263	-63			41						
N 8162	4039040733134	10	-144	-42		-51				20FT	-35	
N 8163	4046050734001	156	5			81						
N 8171	4038560733338	10	-373			-40						
N 8181	4046160733545	141	-99			12						
N 8188	4037180733343	12	-150	-58		-63				20FT	-33	
N 8195	4039340734107	20	-683			-52				20FT	-31	
N 8196	4039520733616	24	-682			-30	-585					
N 8211	4045280734129	120	-105			29	-636					
N 8214	4041560732620	37	-663			-30			N8568			
N 8216	4040000733710	30	-635			-11			N9173			
N 8217	4040040733710	36	-669			-17	-646					
N 8221	404922 734500	75	-215			-146		-155				
N 8233	4035180733820	8	-1223	PRES			-893	-1042				
N 8248	4045250733825	120	-398			15						
N 8249	4046320733111	163	-332			-27	-398					
N 8250	4041090733716	50	-643			-20	-551					
N 8251	4039590734104	25	-660			-49	-530			20FT	-35	
N 8253	4040030733334	25	-675			-40				20FT	-23	
N 8255	4046560734224	105	-195			-59			N8456			
N 8267	4045050734205	125	-160			30	-185					
N 8277	4044190733830	103	-258			7						
N 8319	4039490734325	15	-165			-35						
N 8321	4044000733147	97	-577			PRES						
N 8326	4051160733729	53	-454									
N 8327	4051130733726	53	-309						N8327			
N 8342	404642 734405	18	-425			-81	-179	-277	N9110			
N 8343	4052160733723	138	-282			-4	-96	-239	N8394			
N 8344	4039310734310	10	-50	-48								
N 8354	4035220733700	5	-1270	-61		-87						
N 8355	4048290733159	258	-337			136	-866	-1095				
N 8358	4045300734144	119	-336			23			N8373			
N 8363	4042170732904	56	-544			-30	-252		N8665			
N 8369	4046320733011	160	-35			71						

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,148 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF LLOYD AQUIFER UNIT	BED-ROCK	LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM							
N 8372	4045290734146	119	-229				6		N8373	
N 8373	4045290734146	119	-231				16			
N 8375	404654734223	110	-454				-66	-174	N8456	
N 8390	4040520734216	45	-38				-25			
N 8394	4052170733721	138	-455				11	-105		-444
N 8409	4044200733939	96	-309				-8			
N 8413	4047500734253	39	-96				-24	-96		
N 8414	4035580733027	7	-1073	-56	-85		-113	-993		
N 8415	4042280732933	58	-660				-32		N9338	
N 8423	4043150733436	76	-16				58			
N 8431	4046540734357	68	-28				-26			
N 8432	4048570733521	165	-85				102			
N 8455	4049400734446	55	-224							-205
N 8456	404656734226	105	-519				-73	-182		-510
N 8457	4044560733607	105	-335				35			
N 8466	4038030734142	11	-463	-69			-129			20FT -20
N 8472	4045310733332	126	-70				36			
N 8477	4047520733953	188	-565				112	-252		
N 8480	4042290732934	58	-661				-32	-398	N9338	
N 8481	4037570733817	8	-72				-47			
N 8482	4038420733808	16	-66				-52			20FT -17
N 8487	4041260733052	35	-35				-17			
N 8497	4045190733429	115	-489				66	-445		
N 8499	4045380734127	140	-130				23			
N 8514	4039000732929	5	-245	-45			-61			
N 8516	4045310734126	130	-125				38		N8568	
N 8520	4040510732603	21	-913				-64	-906	N8603	
N 8543	4045280733514	106	-54				66			
N 8557	4035220734108	9	-1286	-71			-127	-772		-971
N 8558	4046310733832	142	-373				7	-351		

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	MAGOTHY CONF AQUIFER	RARIT LLOYD AQUIFER	BED-ROCK				
N 8840	404532 734151	122	-118					22					
N 8842	4044380732953	111	-543					5					
N 8858	4035590734341	10	-94	-88				-74					
N 8873	4039150732708	7	-200	-54				52					
N 8880	4045340733244	122	-125										
N 8881	4040240733742	40	-31					-5					
N 8885	4047400733608	196	-102					106					
N 8896	4040360734309	30	-67					-58					
N 8898	4049410733845	18	-205					-134	-200				
N 8935	4039450734258	15	-351					-52					
N 8941	4043530732910	91	-720					19	-682				
N 8956	4045080733336	115	-477					20					
N 8962	4054210733548	6	-422						-368	-422			
N 8964	404635 734356	47	-188					-143	-173				
N 8976	4041190733231	38	-735					-48	-664				
N 8988	4039280733841	26	-84	-38				-65					
N 8994	4051530734206	21	-287										
N 8995	4053570733109	41	-364						-140	-346			
N 9019	4048530733959	46	-365					-156	-223	-326			
N 9024	4044440733712	94	24					40				N9027	
N 9025	4044440733712	94	32					32				N9027	
N 9026	4044450733712	94	24					31				N9027	
N 9027	4044450733712	94	34					36					
N 9062	4045270733354	124	-19					79					
N 9066	4052040733634	143	-508					5	-121	-282	-461		N9211
N 9084	404357 733317	96	-47					16					N9202
N 9085	404415 733308	102	8					44					N9206
N 9110	404640 734410	15	-371					-90	-174	-281			
N 9151	404224 734238	50	-386					-24	-383				
N 9170	4047540733039	184	-369					40					

20FT -29

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL										REMARKS					
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF SAND	RARIT LLOYD UNIT	BED-ROCK	LOCATED NEAR WELL									
N 9539	4037420733635	6	-54														20FT	-30	
N 9541	4041380733439	28	-77															20FT	-25
N 9550	4039300733409	15	-110															20FT	-38
N 9551	4038080733343	10	-85															20FT	-35
N 9552	4040110733057	15	-80			-49													
N 9553	4038280733032	5	-80			-39													
N 9554	4041050732742	20	-80			-42													
N 9556	4040300732933	20	-135																
N 9565	4041240732915	40	-60																
N 9567	4038460734029	25	-115			-43													
N 9576	4040510732633	15	-60			-45													
N 9577	4041590732707	25	-55																
N 9579	4042180734019	55	-130																
N 9591	4045240732826	121	-579																
N 9593	4054100733120	5	-365																
N 9595	4053000733250	20	-447																
N 9683	4039560733517	25	-40																
N 9684	4040010733306	20	-50																
N 9685	4039590733132	15	-65																
N 9696	4048150732946	194	106																
N 9697	4047130732730	180	51																
N 9699	4051240732926	67	20																
N 9708	4054260733119	12	-375																
N 9792	4039300733829	31	-531			-37													
N 9809	4048380734042	115	-488																
N 9846	404412 733510	85	-530																
N 9965	4044130733707	92	37																
N 9977		173	-43																
N 9978		173	-73																
N10019	404407 733704	87	-213																

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF LLOYD BED-AQUIFER UNIT	ROCK				
S 681	405506 723618	10	-245									
S 716	405612 723856	10	-213									
S 731	4044550732348	85	-44									
S 759	404953 732624	140	6									
S 777	405049 730210	240	5									
S 796	405751 724745	105	-55									
S 848	405714 732349	59	-21								S3554	
S 852	405157 731123	135	-8									
S 853	405736 725943	130	-15									
S 911	404904 724945	45	-19									
S 912	405308 731231	90	-326									
S 919	405553 730332	220	-86									
S 927	404858 732559	350	-169									
S 933	404943 725513	55	-51									
S 939	405117 725750	180	14									S28383
S 970	405752 725832	85	-163									
S 1052	4039310732444	5	-92									
S 1081	405530 732330	59	-50									
S 1101	405718 721250	40	-23									
S 1102	410311 722827	10	-64									
S 1215	405743 724259	95	-19									
S 1250	410605 722142	9	-61									
S 1264	404457 724836	5	-296									
S 1296	4049070732035	240	24									
S 1318	405127 723017	15	-35									S7569
S 1331	404551 725617	30	-30									S67974
S 1341	405412 722328	38	-61									S31037
S 1370	4037560731313	10	-365									
S 1399	405943 720243	20	-319									
S 1407	404941 724706	85	3									

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UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG		ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
	TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF	LLOYD AQUIFER	BED-ROCK					
S 2653	404955	732156	180	66									
S 2654	405759	724205	98	-42									
S 2676	405940	723330	12	-47									
S 2712	410449	722650	53	-15									
S 2730	404757	732155	200	-135									
S 2747	405641	725804	140	50									
S 2752	405417	731215	50	-163									
S 2978	405322	732114	15	-256									
S 3012	405322	732114	15	-166									S44378
S 3045	410251	722625	20	-35									S44378
S 3087	404924	732523	220	35									S4163
S 3123	405919	722609	8	-451									
S 3184	404856	732641	240	-34									
S 3243	405116	730520	100	25									
S 3354	405357	731708	125	-108									
S 3369	405142	731302	85	-33									
S 3438	404908	730705	100	-1									
S 3462	405259	730928	165	24									
S 3468	405008	723822	45	-8									
S 3487	405841	723845	130	39									
S 3488	410122	723236	60	-30									
S 3495	404931	723202	6	-354									
S 3504	404423	732534	80	5									
S 3506	404946	723856	40	-62									
S 3513	405146	730318	101	36									
S 3537	405004	724238	43										
S 3539	405121	724156	79	-9									
S 3554	405714	732347	71	-35									
S 3570	405700	724207	80	-80									
S 3585	410619	720614	80	-10									

S 5670	4048380732037	230	47	184			
S 5696	405556 721648	20	-22				
S 5700	405502 724119	25	-98				
S 5716	4046300732150	200	41	51			
S 5719	404949 732310	200	46				
S 5755	404450 725104	5	-301	-245	-125		
S 5834	404802 730638	98	-36				
S 5869	4046130732336	200	9	156			
S 5901	405701 730443	15	-876	-25	-498	-595	-813
S 5902	405657 730427	120	-410	-36			
S 5915	410156 721016	40	-36				
S 6100	405544 732331	30	-28				
S 6111	410543 720630	60	-43				
S 6187	4043490730209	5	-305	-276	-148		
S 6193	410347 722720	15	-60				
S 6409	405132 725355	117	-1474	-178	-987	-1128	-1448
S 6410	405517 725408	109	22				
S 6411	405650 725418	138	-11				
S 6413	405308 725531	94	-14				
S 6420	405017 725033	65	-24				
S 6421	405025 724951	90	-1				
S 6422	405451 725005	73	-78				
S 6423	405532 725014	100	9				
S 6425	405136 725227	70	-16				
S 6426	405128 725158	69	-17				
S 6434	405223 725234	85	-1515	-157	-952	-1101	-1391
S 6456	405218 725311	91	-126	-119			
S 6457	404803 725214	53	-161	-146			
S 6458	405326 725058	61	-201	-159			
S 6459	405122 725101	45	-120	-100			
S 6513	410038 723338	70	-40				
S 6678	4040220731625	1	-123	-120			
S 6771	410418 722200	100	19		-88		
S 6773	405734 724151	85	-9				
S 6949	405541 731940	8	-93				
S 7016	405628 732402	40	-39				
S 7123	410436 722556	40	-44				
S 7148	4048040732037	170	26	127			
S 7211	410215 723036	67	-69				
S 7218	405632 721214	20	-22				
							S45638

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER	LLOYD AQUIFER	BED-ROCK			
S 7267	410150 723005	18	-25									
S 7271	404602 732415	100	-306							26		
S 7281	410919 721447	13	-9									
S 7285	405831 724138	120	-52									
S 7287	405751 720922	34	-20									
S 7314	404911 732144	215	45							96		
S 7350	403850 730934	10	-412			-120				-300		
S 7352	405747 724027	75	-46									
S 7367	405005 732134	220	57									
S 7499	405620 722037	55	-53									
S 7519	404636 725936	20	-274									
S 7569	405127 723017	15	-16									
S 7570	405840 721145	70	-92									
S 7650	405741 721903	120	33									
S 7688	410241 722855	45	-46									
S 7701	405322 722518	22	-38									
S 7878	410024 723147	25	-32									
S 7881	405603 724804	92	-31									
S 7882	405748 723451	37	-89									
S 7908	405740 723959	68	-44									
S 7935	404853 731654	175	29									
S 8025	405712 724231	85	-45									
S 8077	405639 724220	70	-130									
S 8117	404914 731940	260	10							42		
S 8120	405138 732106	220	-155									
S 8121	405134 731858	180	-147									
S 8128	4048330732430	144	-241									
S 8133	410225 722921	57	-71							82		
S 8205	4048480732033	235	32									
S 8220	410058 720752	50	-14							70		

S31653
S48426

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER UNIT	LLOYD BED-ROCK				
S13568	405605 721906	40	-33									
S13579	404937 732626	175	49					142				
S13591	404600 732624	170	-139					73				
S13620	404937 730603	135	-25									
S13640	405922 723626	85	-34									
S13642	404821 731715	90	-5									
S13712	405244 732414	190	-46									
S13854	403800 732034	10	-309	-80	-100		-180			S30114		
S13876	405013 732638	120	-178				67					
S13886	404404 730506	20	-17									
S14150	404352 731343	11	-60									
S14250	404835 730634	110	-27									
S14326	404920 731427	70	-155									
S14521	405143 732019	200	-352									
S14559	405320 725831	85	4									
S14560	404733 730440	88	27									
S14579	404954 731839	157	-397									
S14588	404928 730534	132	-8									
S14612	405746 725635	100	-40									
S14623	410903 721520	12	-30									
S14675	405113 732606	230	-365									
S14678	404628 724308	10	-366	-100	-180		-210					S43001 S47024 S67974
S14710	404553 725618	30	-86									
S14750	405559 732324	100	-35									
S14759	404816 732150	200	-211									
S14767	405452 724001	20	-195									
S14776	405459 731634	60	-36									
S14792	405454 730258	165	-288									
S14825	404538 732622	140	-53									
S14828	405113 732606	227	-279									

S65321

S16714 405242 724117 260 -44

S16756 405843 723529 60 -6

S16757 405801 723454 40 -11

S16760 410045 723237 67 -15

S16761 405935 723058 27 -24

S16763 410104 723143 57 -14

S16764 410102 723031 38 -25

S16777 410225 722837 37 -29

S16787 410858 721715 43 -1

S16892 404947 724056 45 -31

S16893 404945 724142 45 -24

S16936 4043540732525 75 -136

S17037 404952 725836 90 -65

S17128 411043 721210 16 -45

S17131 411111 721119 65 -31

S17135 411053 721140 36 -20

S17137 411038 721149 16 -26

S17181 4043400730834 1 -313

S17215 405020 723715 25 -30

S17438 405221 730329 90 -155

S17553 405023 723715 25 -36

S17630 404933 730603 135 -43

S17631 403806 732019 12 -314

S17668 404937 725500 50 -19

S17689 405454 730300 165 -375

S17705 404856 724341 10 -375

S17835 410035 723335 60 -41

S17963 405753 730145 10 -510

S18003 4042320732041 26 -645

S18058 404952 732115 265 -441

S18075 4047070731905 110 -517

S18075 404707 731905 110 -517

S18129 404843 725506 40 -40

S18261 404707 731904 110 -278

S18473 4050000730723 65 -595

S18480 404653 725118 32 -361

S18528 404355 725202 15 -412

S18566 404528 731505 52 -601

S18621 404707 731904 110 -91

S18729 404600 725210 23 -332

-38

S19408

PRES -129

-108

PRES -80

-68

-51

S46928

-132

-104

-50

S40498

30

-155

S18621

-155

-156

S18621

-490

-188

S71083

-237

-51

-123

S52943

-133

-115

-217

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF LLOYD SAND	RARIT UNIT	BED-ROCK				
S18795	405931 720623	10	-45										
S18822	404809 724154	15	-30										
S18846	404002 730329	15	-534										
S19048	4043040731617	25	-710										
S19057	405040 731758	150	-531										
S19123	4044430730939	20	-189										
S19198	405356 732758	115	-607										
S19317	4039420730501	3	-481										
S19395	404907 731050	139	-28										
S19408	404953 725836	92	-74										
S19485	410406 715239	50	-113										
S19488	410340 715245	48	-115										
S19490	410338 715205	31	-132										
S19554	404235 732256	41	-64										
S19564	405455 730728	140	-494										
S19565	404551 731043	44	-75										
S19576	404448 731056	25	-65										
S19584	404808 731133	95	-62										
S19767	405506 731801	15	-13										
S19884	405130 730718	80	-223										
S19885	405129 730719	72	-223										
S19961	404932 724835	67	-33										
S19965	404225 731812	25	-21										
S19988	410835 721823	20	-24										
S20008	405506 722359	100	-26										
S20041	404444 732511	80	-188										
S20042	404444 732511	80	-505										
S20057	404520 732241	79	-121										
S20060	405547 723909	25	-325										
S20071	404455 730041	5	-41										

S20300	4045200732241	75	-157	-101	-121	1	S39535
S20305	4038180731117	10	-438	-88	-108	-207	
S20315	404726 725105	38	-222		-158	-158	
S20318	404733 731631	110	-495		-85	-85	
S20369	4049360731525	120	-192		-20	-20	S58708
S20431	410503 722309	10					
S20460	404235 732256	41	-458	-53	-69	-69	
S20479	404547 731042	45	-83	PRES	-72	-72	S27533
S20530	405258 732032	280	-435		-386	-386	S33970
S20560	410110 720953	28	-23				
S20566	4043400731541	26	-749		-48	-48	
S20591	405257 730459	105	-45				S43117
S20601	404839 732328	155	-309		73	73	
S20633	405212 724726	50	-10		-49	-49	
S20635	4044020731932	41	-663		-270	-270	S23631
S20689	405047 731204	40	-556				
S20705	404639 725857	42	-58				
S20839	405713 725714	110	-81				
S20900	404837 725952	85	7				
S20908	405553 721535	30	-32				
S20924	4038270731015	10	-475	-106	-126	-221	
S20930	404723 730608	80	-60				
S20955	4041560732123	22	-608		-48	-48	S31038
S21009	4046060731209	45	-387		-80	-80	
S21079	405221 730329	90	-152				
S21080	403727 731547	10	-1105	-86	-92	-214	S21091
S21091	403727 731546	10	-2004	-86	-92	-214	
S21095	410227 722327	25	-23		-1141	-1404	-1980
S21119	405357 732800	115	-658		-258	-349	-607
S21120	405446 730650	120	-383		-19	-19	S36166
S21121	405134 732357	220	-381				S38785
S21134	405108 731742	160	-387		-305	-305	
S21244	404304 731615	23	-679		-60	-60	S42762
S21247	404717 725956	60	-85				S62022
S21362	4047480732255	158	-407		89	89	S74284
S21366	404357 731816	45	-425		-59	-59	
S21375	4042220731904	18	-483	-57	-64	-64	
S21404	405612 730055	133	-111				
S21405	405253 730310	115	17				
S21487	404323 732225	43	-662		-47	-47	S40330

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL								LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	MAGOTHY CONF LLOYD AQUIFER	RARIT UNIT	BED-ROCK					
S21529	405545 724112	42	-193											
S21632	405451 730650	120	-400											S57748
S21734	405519 732939	64	-389											
S21768	405050 724933	90	-43											
S21873	404840 725138	60	-40											
S21906	410419 721917	20	-30											
S21944	405037 731027	55	2											
S21945	405159 730855	123	-627											S37174
S22001	404928 730627	89	-20											
S22015	4047500732455	160	-582							8	-556			
S22048	405257 732034	290	-312											S33970
S22169	4038140731146	5	-428							-120	-203			
S22171	405127 730709	120	-330								-244			
S22278	4043650732300	60	-124								-50			
S22303	403821 731820	10	-275							PRES	-145			
S22351	4040500732324	21	-637								-59			S70458
S22362	404959 731656	155	-160								-159			
S22453	405028 730321	165	-71											S54473
S22471	404922 731629	165	-218								-62			S23832
S22494	4046170731229	50	-70								-62			
S22508	405050 730329	190	-37											
S22547	405159 730448	95	-11											
S22548	404707 731904	114	-301								-151			
S22568	405132 730959	110	-140											
S22577	4049020730940	61	-846								-319	-777		S35679
S22640	405626 730319	225	-425											S24663
S22673	404649 730501	50	-109											
S22683	404836 730346	75	-46											
S22711	404633 730708	70	-70											S67074
S22785	405252 724035	175	-102											

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL SAND	MON GREEN SAND	RARIT MAGOTHY CONF AQUIFER	LLOYD BED-ROCK			
S23827	405245 725850	90	-60								S23828
S23828	405244 725850	90	-60								
S23832	404922 731628	165	-240								
S23848	404430 732113	50	-584								
S23876	404935 724326	30	-70								
S23971	405831 721318	70	-29								
S23997	405050 732145	200	-505								
S23998	405140 732221	220	-446								
S23999	405018 731817	160	-544								
S24047	404801 731004	70	-65								
S24121	405316 725545	85	-9								
S24545	405251 731427	160	-352								
S24552	403810 731220	5	-666								
S24663	405626 730318	230	-230								
S24769	404819 731603	139	-719								
S24772	404813 731356	120	-846								
S24775	405240 730705	130	-5								
S24846	404639 731514	90	-427								
S24848	405231 723129	50	-73								
S24875	405700 721704	55	-23								
S25036	405707 721945	91	-39								
S25257	405959 720807	40	-18								
S25260	405354 725353	90	-20								
S25399	405859 722241	70	-50								
S25511	404407 731547	40	-40								
S25617	404458 731823	64	-377								
S25674	404431 732115	50	-575								
S25709	410442 722203	5	-5								
S25776	405307 731752	200	-386								
S26059	404521 730637	43	-32								

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD- INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT CONF UNIT	LLOYD AQUIFER	BED- ROCK				
S29296	405311 722156	20	-30										
S29411	405448 730651	111	-442									S36166	
S29491	4041200732245	25	-474										
S29492	404912 730332	116	-139									S68666	
S29501	405420 724755	45	-16										
S29663	405647 725706	135	-36										
S29704	405458 730729	140	-158										
S29732	405337 730736	145	-420									S35446	
S29743	405856 720639	50	-258										
S29751	405442 725420	75	-33										
S29776	4047100732640	195	-640										
S29823	404521 732252	76	-546										
S29852	405042 731955	190	-500										
S29896	405457 730712	120	-340										
S29897	405450 730734	140	-134										
S29962	4048320732207	208	-467										
S29981	405051 724513	90	-35										
S30007	4046070732530	101	-491										
S30008	405058 732338	185	-303										
S30088	405655 725902	165	-118										
S30114	403800 732034	10	-317										
S30118	404913 730965	58	-139										
S30193	404524 731606	65	-15										
S30207	410321 715645	125	-52										
S30208	410327 715652	135	-40										
S30230	405124 723537	40	-1584										
S30234	404755 731312	112	-78									S53593	
S30235	4048060732613	280	-60									S37141	
S30271	405548 724126	26	-1260										
S30296	405806 730723	25	-55										

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON SAND	RARIT MAGOTHY CONF AQUIFER	LLLOYD AQUIFER	BED-ROCK			
S34022	404657 732104	220	-340									
S34032	404808 731912	150	-291									
S34058	405208 722355	10	-27									
S34063	4046350732140	200	-536					58			S34064	
S34064	404635 732140	200	-432					39				
S34100	4043500732202	53	-658			-39		-72			S65505	
S34156	404953 724608	80	-20									
S34215	404913 730829	95	-3									
S34272	405713 724713	130	-871					-150	-660		S51580	
S34293	410056 721227	50	-38									
S34300	405015 730516	72	-378					-74				
S34301	405612 730516	96	-439					-82			S57979	
S34354	405425 724433	30	-110									
S34390	410003 721117	5	-45									
S34460	405253 731427	153	-446					-75				
S34477	405039 725954	150	-30									
S34629	404901 725015	17	-133									
S34632	405440 721908	17	-31									
S34651	405147 730740	94	-323									
S34652	405148 730755	94	-8								S39187	
S34653	405149 730801	100	-600								S39187	
S34655	405624 723908	25	-240									
S34674	405415 722639	15	-45									
S34733	405144 731057	126	-295					-164			S47673	
S34743	405040 724148	65	-1161			-105		-137	-985			
S34839	405009 724507	120										
S34851	405054 731002	70	-14									
S34892	405519 725749	122	-16								S34894	
S34893	40551725749	125	-719					-555	-719			
S34894	405518 725749	123	-622					-547				

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WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF	LLOYD AQUIFER	BED-ROCK				
S36965	405639 721811	52	-110										
S37140	404510 731123	35	-295	-69				-86				S42827	
S37141	404755 731314	112	-316					-66					
S37144	4047530730244	76	-126	-104				-114					
S37145	4048040730512	98	-112	-96				-102				S54305	
S37174	405159 730856	123	-186					-118					
S37276	404918 731330	40	-360					-98					
S37301	405409 730611	148	-167					-37					
S37351	405141 731908	171	-492					-293	-461			S53747	
S37494	404717 725956	60	-562					-100				S62022	
S37681	4042320732256	42	-541	-52				-68					
S37847	404932 730603	136	-318					-308				S64609	
S37991	405456 725327	102	-39										
S38035	4047230732453	132	-318					82					
S38192	4045270731503	66	-539	-60				-74				S71083	
S38194	405654 725902	157	-618					-600					
S38320	404756 730255	75	-98									S42761	
S38321	404756 730255	63	-240					-133				S42761	
S38491	404922 731227	61	-342					-209					
S38595	405257 730501	100	-500					-305				S43117	
S38784	405256 730456	105	-498					-300				S43117	
S38785	405136 732357	202	-499										
S38916	405418 730649	227	-618					-27	-563			S40980	
S39184	405147 730804	93	-607									S39187	
S39185	405147 730805	93	-526									S39187	
S39186	405147 730803	93	-590										
S39187	405147 730804	95	-603										
S39333	405208 731314	64	-594					-422				S40711	
S39347	405054 730509	128	-48									S42760	
S39518	4051180731238	76	-649					PRES	-594			S42473	

UPPER SURFACE ALTITUDE OF MAJOR HYDROGEOLOGIC UNITS AT 3,146 WELLS ON LONG ISLAND, NEW YORK

WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL							LOCATED NEAR WELL	REMARKS
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	MAGOTHY CONF UNIT	RARIT LLOYD AQUIFER	BED-ROCK			
S42270	405119 731237	76	-573					PRES			S42473	
S42473	405119 731237	76	-573					PRES				
S42504	405215 730115	110	-113									
S42505	405213 720113	110	-113									
S42760	405054 730509	130	-43									
S42761	4047560730255	75	-258					-115				
S42762	4043050731614	26	-688					-64				
S42827	404511 731123	35	-628	-62				-92				
S43001	405113 732609	230	-360						-318			
S43010	404804 724838	20	-680	-76		-94		-144			S46712	
S43088	4046400731521	90	-812					-66		-772		
S43101	4051400730240	40	-663					-116				
S43117	405256 730456	102	-450					-305				
S43516	4046180730356	55	-748					-101				
S43808	404323 732534	66	7									
S43810	404124 732416	30	-46								S66135	
S43811	404530 732411	102	12									
S43813	404158 732258	35	-43									
S43814	404455 732150	60	10									
S43816	404237 732206	40	-40									
S43817	404618 732050	70	14									
S43819	404250 732023	30	-48									
S43820	404649 731840	110	12									
S43822	404302 731855	20	-54									
S44032	4051470730649	118	-635							-136	S62240	
S44137	4044320731513	39	-681								S50546	
S44186	4050040730227	165	-508	-46				-54			S53291	
S44378	405322 732114	27	-440					-103				
S44467	405122 725407	105	-608								S47438	
S44640	405710 725713	155	-50							-107		

S47310	405407	730011	135	-9			S52451
S47428	405704	721659	63	-8			S47438
S47436	405124	725408	105	-91			S47438
S47437	405124	725408	105	-74			
S47438	405124	725408	105	-164		-103	
S47439	404739	725627	71	-636		-114	S49018
S47453	404804	730513	100	-343		-102	S54305
S47672	4048100731132	100	-634	-86		-150	S51519
S47673	405142	731058	109	-170			
S47675	405111	730658	80	-10			
S47698	405307	730609	133	29			
S47711	4041190732219	25	-196	-47		-68	
S47718	404941	730654	68	17			
S47741	405211	732507	70	-489			
S47743	404642	730058	35	-65			
S47745	405417	725727	62	30			
S47746	404847	725713	90	6			
S47747	404740	725452	31	-4			
S47748	405638	725147	110	74			
S47750	405004	725154	95				
S47752	404607	725947	23	-77			
S47755	405136	724645	63	5			
S47756	404922	725950	89	20			
S47757	405008	730255	160	22			
S47758	404852	730504	121	19			
S47886	404204	732420	43	-468	PRES	-47	
S47887	404046	732521	26	-622	-56	-64	
S47945	405648	725551	143	1			
S47973	405604	730843	94	4			
S47974	405532	730257	149	-1			
S47975	405050	725953	153	24			
S47976	405605	725915	150	12			
S47977	404711	725150	38	-17			
S48014	405203	730855	124	-219		-109	
S48193	404515	732255	80	-454		1	
S48422	4049480730848	95	-640	-165			S51953
S48423	405609	730213	133	-554			S52944
S48424	404904	725700	102	-708		-180	
S48425	405606	722027	35	-9			
S48426	405740	721900	117	-4			

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WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF	LLOYD AQUIFER	BED-ROCK			
S48427	405618 721805	38	-14									
S48429	405807 721210	50	-16									
S48430	405501 722155	22	-21									
S48432	405606 722357	52	-11									
S48433	405644 722201	78	-57									
S48434	405227 723523	170	-17									
S48435	405051 723531	170	111									
S48436	405229 724156	112	7									
S48437	405831 721712	65	-7									
S48438	405844 721916	114	32									
S48439	405325 722627	31	-20									
S48441	405349 722348	47	-14									
S48442	404941 724148	44	-11									
S48517	405838 721540	36	-35									
S48518	405650 721452	37	-34									
S48519	410243 715601	80	-2									
S48520	405918 721321	50	-12									
S48521	405940 721647	48	-27									
S48522	405858 720624	20	-72									
S48577	410149 715832	180	71									
S48578	405928 721104	90	58									
S48579	410316 715355	28	-38									
S48580	410124 721032	40	-6									
S48581	405808 723222	60	-16									
S48582	405225 723701	80	-25									
S48583	405139 723850	87	-52									
S48661	405316 730416	100	36									
S48719	405319 732336	101	-248									
S48759	404641 730054	28	-7									
S48946	405121 724906	40	-5									

S52434	405426	731216	15	-58				
S52449	405512	723952	58	17				
S52451	405407	730011	133	-50				
S52490	405354	730212	137	-417				
S52886	405513	725054	45	-12				
S52943	404558	725210	23	-287	-89	-115	-217	
S52944	404905	725655	102	-102				S65766
S53274	4047580	731227	109	-691			-97	
S53291	405002	730226	180	-85				
S53322	410057	723155	53	-47				
S53323	410702	722216	30	-22				
S53324	410104	723033	42	-20				
S53325	410007	723319	41	-27				
S53326	410229	722957	60	-32				
S53327	410022	722936	24	-20				
S53328	410234	722436	20	-21				
S53329	410140	722816	30	-41				
S53330	410706	722032	15	-37				
S53331	410753	722055	47	-23				
S53332	405843	723243	25	-20				
S53333	405924	723423	51	-23				
S53334	405959	723039	32	-21				
S53335	410304	722627	16	-21				
S53336	410017	723155	18	-24				
S53337	410906	721713	20	-32				
S53338	410412	722613	39	-26				
S53339	4047220	730305	50	-748	-122		-140	S66183
S53360	405032	731628	141	-562			-88	
S53361	405133	731559	148	-373			-75	
S53497	404950	730850	90	-83				S63498
S53498	404950	730850	90	-631			-180	
S53522	405230	724300	167	-121			-81	S63851
S53593	405124	723536	47	-114				
S53747	405140	731910	171	-282			-117	
S53851	405230	724300	167	-124			-81	
S54099	4050290	730321	170	-533			-130	S64473
S54155	4043260	731735	38	-683			-97	
S54162	405359	731828	151	-392				
S54305	404805	730515	100	-213			-96	
S54308	404759	731225	109	-688	-78		-106	S65766

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WELL IDENTIFICATION NUMBER	LAT-LONG	ALTITUDE OF WELL, IN FEET ABOVE OR BELOW SEA LEVEL		HYDROGEOLOGIC UNIT PENETRATED AND ALTITUDE OF UNIT SURFACE, IN FEET ABOVE OR BELOW SEA LEVEL						LOCATED NEAR WELL	REMARKS	
		TOP	BOTTOM	GARD-INERS CLAY	JAMECO GRAVEL	MON GREEN SAND	RARIT MAGOTHY CONF LLOYD SAND	BED-ROCK				
S54377	403936 730525	5	-625			PRES						
S54473	405030 730321	170	-142									
S54478	405906 723528	65	-502									
S54479	405857 723538	65	-402									
S54568	404210 732502	45	-378			-38						S55076
S54731	403822 731550	8	-742	PRES								
S54957	4046180731233	50	-328									
S55028	405332 722420	50	-165									S66825
S55076	405856 723540	68	-275									
S55094	405122 732327	185	5									
S55502	405624 730221	115	-508									
S55733	404326 731741	38	-195									
S56133	405434 731942	70	-263									
S56423	4044180731718	50	-750									
S56508	4045420730133	6	-703			-116						S72917 S60486
S56674	404950 730015	107	-72									S63256
S56980	405935 723548	35	-1069									
S57008	4046580731642	111	-524									
S57354	405126 732737	50	-207									
S57357	410249 715545	32	-111									
S57486	405548 730053	131	44									
S57686	404604 732458	105	-165									
S57691	405231 730113	81	34									
S57723	404522 730450	38	-769									
S57748	405520 732939	82	-336			PRES						S60812
S57979	405614 730515	100	-482									
S57980	405510 730452	187	-575									
S58708	4049360731525	132	-291									
S58755	405052 730205	240	-12									
S58761	405342 730307	130	-593									

S65505	404352	732158	54	-596	PRES	-132
S65681	405549	725936	144	34		-110
S65766	404759	731228	100	-696		
S65855	405351	725351	78	46		
S65856	405424	725456	80	17		
S65857	405429	725548	79	-2		
S65859	405453	725801	92	31		
S65860	405503	725928	135	28		
S66132	404605	732417	100	-40		40
S66133	404330	732441	63	-98		-33
S66134	404235	732411	50	-100		-44
S66135	404124	732415	30	-138	-60	-63
S66136	403935	732350	5	-139	-63	-118
S66137	404653	732121	160	17	-70	63
S66138	404430	732156	60	-90	-30	-44
S66139	404332	732122	45	-107		-41
S66140	404205	732100	24	-88		-51
S66141	404058	732025	5	-128	-54	-59
S66142	404815	731632	150	-53		-21
S66143	404540	731754	70	-115	-36	-45
S66144	404448	731641	55	-88	-55	-63
S66145	404335	731712	40	-135		-60
S66146	404201	731638	10	-133		-65
S66147	404251	730959	10	-174	-89	-145
S66148	404614	731336	66	-87	-106	-53
S66149	404524	731234	40	-143		-74
S66150	404430	731233	25	-138	-59	-78
S66151	404308	731318	5	-145	-70	-100
S66152	404806	731219	115	-78		-48
S66153	404645	731053	50	-113		-68
S66154	404548	731010	30	-123	-79	-92
S66155	404447	731041	20	-135	-81	-98
S66156	404334	730955	15	-158	-95	-125
S66183	404722	730305	71	-472	-139	-159
S66366	405158	732548	170	-309		
S66496	405058	730509	127	-666		-78
S66506	405245	725737	83	20		
S66507	405345	725911	100	24		
S66510	405350	730316	138	31		
S66511	405644	730512	105	-17		

S68654

S71891	405500	723345	150	-421	-164
S72580	404801	732431	150	-505	90
S72812	404804	725540	35	-175	-120
S72813	404732	725543	65	-183	-122
S72814	404653	725522	55	-166	-117
			-109		
S72917	404419	731716	50	-462	-70
S73063	404637	731409	60	-845	-80
S73270	405641	724310	70	-235	-133
S73341	404814	730956	65	-751	-295
S73357	405559	724252	60	-275	
S73370	405412	722520	64	-376	-186
S73432	405650	724306	65	-240	-117
S73508	405627	724240	60	-365	-345
S73990	405616	721823	34	-511	-176
S73993	405642	722400	24	-214	
S73994	405600	721500	12	-291	-153
S73998	405858	722136	99	-704	-276
S74284	404750	732253	155	-651	74285,74286
S74573	405102	732524	251	-401	107
S74585	404849	732612	365	-488	95
S75034	404433	732449	80	-750	74586,74587
S75454	404859	731940	225	-630	75455,75456
S76016	404530	731811	65	-792	76017,76018
S76673	404942	731755	128	-614	-249
S77010	404749	730845	55	-804	-513
S77379	405845	720824	43	-311	-167
S77436	405317	723317	20	-1127	-120
S77700	404351	730541	20	-389	-220
S77842	404640	730800	60	-449	-402
			-105	-148	
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