REGIONAL GROUND-WATER STUDY
TOWN OF MINISINK
ORANGE COUNTY, NEW YORK

Prepared for

Orange County Water Authority

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Virogroup, Inc. - ETE Division

WATER SUPPLY DEMAND

Unionville Water District

With the three existing hand driven wells and one drilled well in service, the Village of Unionville currently cannot meet the daily water demands. As a result the Village is buying water from the Minisink Rubber Mill; based on an emergency approval from the Orange County Health Department.

According to Harry Doty the average daily demand is approximately 60,000 gpd, and summer time peak is 100,000 gpd (Doty, 1993).

Pheasant Hill Subdivision

The present supply meets the estimated average daily demand of 14,800 gpd and estimated maximum daily water demand of 45,200 gpd. The estimated yield capacity of the well at Pheasant Hill is 42 gpm or 60,480 gpm (OCDH, 1992).

Projected Water Demands

The projected water demands for these water systems are expected to remain constant. The Pheasant Hill Subdivision is at its maximum; based on the Orange County Health Department's approvals of 50 dwelling units.

The Village of Unionville currently is operating at a water supply deficit and is undertaking the reconstruction of its distribution system. The Village population fell from 574 to 548 between 1980 and 1990 (US Census, 1990). There is no significant increase in water demand anticipated for Unionville.

GEOLOGY

Sand & Gravel Aquifers

There are two defined sand and gravel aquifers in the Town of Minisink; one is located in the Rutgers Creek Valley and the other is located in the Southern Wallkill River Valley.

Frimpter states the sand and gravel deposits in the Rutgers Creek Valley were deposited into a postglacial lake between Unionville and Johnson. The recharge area of this aquifer is 2.8 square miles and the estimated yield from this aquifer is estimated to be 1.6 mgd. Frimpter notes the sand and gravel aquifer is preferred in this area, because water from the deeper shale bedrock frequently contains hydrogen sulfide (Frimpter, 1972).

The Southern Wallkill River Valley contains a sand and gravel aquifer under organic soil and clay. The clay and silt lake sediments cover most of the aquifer and transmit water very slowly. These sediments limit recharge to the aquifer and ultimately limit the potential yield of the aquifer. Frimpter estimates the annual infiltration to this aquifer is 1 mgd (Frimpter, 1972).

Bedrock Aquifers

The Town of Minisink, and most of the region surrounding the Town, is underlain by layered sedimentary bedrock covered by unconsolidated glacial deposits as mapped by Fisher, et al., 1970. The uppermost formation in the western portion of the Town is mapped as the Austin Glen Formation (graywache and shale) and the eastern portion of the Town as Wappinger Group (limestone and dolostone).

The layered sedimentary bedrock in the region exhibits thin to massive bedding and is considered to be a relatively prolific aquifer. Some beds are highly fractured and weathered. The limestone formation is moderately soluble and fracture openings are commonly enlarged by dissolution of the rock. This results in high secondary permeability, and in some places the rock is an excellent aquifer; producing large quantities of water. Some of the limestone-dolostone and conglomerate units are so highly fractured and weathered that wells developed in these units produce persistently turbid water, presenting well-development problems and potentially permanent water-quality problems.

Several wells in Orange County completed in the Wappinger Group produce in excess of 200 gpm, and offer significant potential for ground-water development in the region. Although the Austin Glen formation is not as prolific, this bedrock unit has the potential for development in high yielding wells.

LAND USE

The majority of the Town consists of vacant land used for agricultural purposes. The majority of the remaining land use is residential. There is one incorporated village, the Village of Unionville, and

two hamlet areas, Westtown and Johnson. The little commercial land use within the Town is located in the Village and hamlet areas (Space Track, 1993).

ALTERNATE COUNTY LANDFILL CANDIDATE AREAS

Orange County has targeted several potential candidate areas for possible landfill development. Candidate area L5 is located in the Town of Minisink and the Town of Greenville. This area is generally wooded and sparsely developed. There are watercourses that cross portions of this area and portions of the site are wet.

No ground-water sources are known to exist in the candidate area. Extensive onsite exploratory testing would be necessary to determine the suitability of this site for use as a waste disposal facility.

WATER QUALITY

Water from both the private supply system located at Pheasant Hill and the Village of Unionville is of good quality. The Pheasant Hill well and at least one well in the Village of Unionville are completed in bedrock. Neither of these supply systems require treatment. However, the Orange County Department of Health has requested the Village to perform tests to determine whether the well water is under the influence of the surface water in the nearby creek (OCDH, 1992).

INVENTORY OF GROUND-WATER CONTAMINATION PROBLEMS

Existing Ground-Water Contamination Problems

The review of existing known ground-water contamination sites included the New York State Department of Environmental Conservation inactive hazardous waste sites, remediation projects (NYSDEC spill response), solid waste sites and RCRA sites for the Town of Minisink and Village of Unionville. This data was gathered for the community consultants by Lawler, Matusky and Skelly Engineers under a contract from the Orange County Water Authority for this project. No confirmed ground-water contamination sites, for this area, were included in the report (LMS, 1993).

Potential Ground-Water Contamination Problems

Information about potential ground-water contamination sites was obtained from:

- FOIL request to NYSDEC (LMS, 1993); and
- Land use data from the Orange County, New York Real Property Tax Assessment data base (Space Track, 1993).

The following summarizes the potential ground-water contamination sites including the New York State Department of Environmental Conservation's potential inactive hazardous waste sites. In addition, a list of possible ground water contamination sites has been developed by ViroGroup after discussions with Town and Village personnel. The following sites were inventoried and are shown on the Minisink Plate.

Minisink Rubber Company

No specific information is available. The site is located on the south side of New York State Route 284 near the New York/New Jersey state line (LMS, 1993).

Carnegie Coating Corporation

No specific information is available. The site is located on the south side of State Line Road near the Wallkill River and the New York/New Jersey state line (LMS, 1993).

Carruso

According to Town officials, the Carruso site was a construction and demolition landfill site with a very short life. When materials were dumped at the site, the NYSDEC was notified. The NYSDEC then ordered their immediate removal. The site is located on the north side of the intersection of New York State Route 284 and Dickerson Road.

Town Salt Storage

Town Highway Department salt storage location. The salt storage area is located on Water Loo Road next to the Town Hall.

Town Landfill

Inactive Town landfill site. The site is located on Ford Lea Road (Lane, 1994).

Each property in Orange County has a land use code number. Properties with land use code numbers associated with potential contamination of ground

water were identified through analysis of the Real Property Tax Assessment data base by Space Track, Inc. The types of land uses in the potential contamination category include:

- industrial facilities;
- gas stations;
- dry cleaners, and
- auto repair facilities.

Where possible, approximate locations of these sites are shown as triangles on the GIM.

Petroleum Bulk Storage Facilities

The FOIL request from NYSDEC inventoried Petroleum Bulk Storage Facilities which are presented on Table 5.

The above sites are listed as potential groundwater contamination sites. Further investigation would be required to determine if contamination exists at the respective locations.

CONCLUSIONS

The Village's present and projected average water demand is about 60,000 gpd, with a summertime peak reaching 100,000 gpd for approximately one month. Until this year, the four existing village wells were marginally capable of meeting average daily demand and were inadequate to meet maximum daily water demands during the summer months. During the summer peaks, water was purchased from The Minisink Rubber Company. This year, in addition to purchasing water during the summer months, the Village continues to purchase water from The Minisink Rubber Company on an emergency basis, with monthly approvals by the Orange County Health Department.

The Village Water Superintendent reported the Village intends to seek a new water source and upgrade their distribution system as funding becomes available (Dondures, 1993).

The Pheasant Hill water supply is a small private water-supply system. The system has one bedrock well with a reported yield of 42 gpm or 60,480 gpd. This well meets the average daily demand of 14,800 gpd and reported maximum of 45,200 gpd.

REFERENCES

Frimpter, Michael H., 1972, "Groundwater Resources of Orange and Ulster Counties", New York, U.S. Geological Survey Water Supply Paper, 1985.

Lawler, Matusky & Skelly Engineers, October 1993, "Environmental Data Gathering for Community Consultants, Town of Minisink, File No. 677-011.

Orange County Department of Health, Short Form Inventory Report, Village of Unionville, 1992.

U.S. Bureau of Census, Municipal Populations, 1990.

Verbal Communication, September 1993, John Dondures, Village of Unionville Water Superintendent.

Verbal Communication, September 1993, Harry Doty, Village of Unionville Department of Public Works.

Verbal Communication, September 1993, Mark Edsall, Village of Unionville Engineer.

Verbal Communication, September 1993, William Hauser, Town Engineer, Town of Minisink.

Verbal Communication, January 1994, Louis Lane, Town Supervisor, Town of Minisink.

Space Track, Inc., 1993, "Orange County Landuse Maps."

TOWN OF MINISINK

Summary of Available Well Data

Well Water District	Tax Map Municipality Section Block Lot	Map Location I.D. #	Well Status	Reported Yield (gpm) Original Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well #1 Unionville Village	Unionville 102 2 4	Minisink MS-1	In service active	Artesian	N/A	2	N/A	N/A	Sand and gravel	N/A	Hand Driven
Well #2 Unionville Village	Unionville 102 2 4	Minisink MS-2	In service active	Artesian	N/A	1.5	N/A	N/A	Sand and gravel		Hand Driven
Well #3 Unionville Village	Unionville 102 2 4	Minisink MS-3	In service active	Artesian	N/A	1.5	N/A	N/A	Sand and gravel		Hand Driven

TABLE 1
(continued)

TOWN OF MINISINK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality Section --- Block --- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comment.
Well #4 --- Unionville Village	Unionville 102 --- 2 --- 4	Minisink --- MS-4	In service --- active	10 gpm ---	450	8	43		Bedrock	1981	
Well #5 --- Minisink Rubber Mill	Unionville 101 --- 2 --- 36	Minisink --- MS-5	In service --- active	100 (per Frimpter)	N/A	N/A	N/A	N/A	N/A	N/A	Well Data Requested by OCHD
Well #4 --- Pheasant Hill	Minisink 5 --- 1 --- 10.1	Minisink --- MS-6	In service --- active	42 --- N/A	185	6	105		Bedrock	N/A	14,800 GPD 45,200 MAX GPD

gpm - Gallons per minute.
NA - Not available.

Well Status: In service - active; In service - stand by; Inactive - equipped; Inactive - not equipped; Abandoned

mstbl1/orange

TABLE 2A

REGIONAL GROUND-WATER STUDY
TOWN OF MINISINK

PHEASANT HILL SUBDIVISION

Summary of Well Yield Capacities

Well ----- Water District	WSA No. ----- Permitted Yield (gpm)	Average Yield Capacity (gpm) ----- (gpd)	Maximum Yield Caacity (gpm) ----- (gpd)	Comments
Well 4 --------- Pheasant Hill	------- 42 gpm	10 gpm ------- 14,800	31 gpm ------- 45,200	
TOTALS	(Total Permitted Yield) 42 gpm	(Total Yield Capacity) 10 gpm -------- 14,800	(Total Maximum Yield Capacity) 31 gpm -------- 45,200	

gpm - Gallons per minute.
gpd - Gallons per day.
WSA No. - Water Supply Application Number.

TABLE 2B

REGIONAL GROUND-WATER STUDY
TOWN OF MINISINK

VILLAGE OF UNIONVILLE

Summary of Well Yield Capacities

Well --- Water District	WSA No. --- Permitted Yield (gpm)	Average Yield Capacity (gpm) --- (gpd)	Maximum Yield Caacity (gpm) --- (gpd)	Comments
Wells 1-4 --- #1	------	N/A --- 60,000	N/A --- 60,000	
TOTALS		(Total Yield Capacity) N/A --- 60,000	(Total Maximum Yield Capacity) N/A --- 60,000	

gpm - Gallons per minute.
gpd - Gallons per day.

WSA No. - Water Supply Application Number.

TAB_ _3

REGIONAL GROUND-WATER STUDY
VILLAGE OF UNIONVILLE
ORANGE COUNTY, NEW YORK

Summary of Water-Supply Sources

The Village of Unionville utilizes three existing hand driven wells and one low yielding driven well. In addition, the Village buys water from the Minisink Rubber Company on an emergency basis.

Existing Source

	Water District	Ground Water (mgd)
Current Average Daily Water Demand	Village of Unionville	.06
Current Maximum Daily Water Demand	Village of Unionville	.1
Maximum Yield Capacity	Village of Unionville	.06
Average Yield Capacity	Village of Unionville	.06
Proposed Sources (Average Day)		
TOTAL MAXIMUM YIELD CAPACITY (MGD) = **CURRENT MAXIMUM DAILY USE (MGD) =**		.06 .1

mgd - Million gallons per day.

COMMENTS

- Does not include emergency use of Minisink Rubber Company well

TABLE 4

REGIONAL GROUND-WATER STUDY
VILLAGE OF UNIONVILLE

Projected Water Demand
1993 - 2020
(gpd)

Water District	Current Maximum Yield Capacity (gpd)	Current and Proposed* Maximum Yield Capacity (gpd)	1993 Projected Water Demand --- Water-Supply Adequacy**	2000 Projected Water Demand --- Water-Supply Adequacy** or ***	2010 Projected Water Demand --- Water-Supply Adequacy** or ***	2020 Projected Water Demand --- Water-Supply Adequacy** or ***
#1	0.06	0.06	0.10 --- -0.04**	0.10 --- -0.04**	0.10 --- -0.04**	0.10 --- -0.04**
TOTAL	0.06(1)	0.06(1)	0.10 --- -0.04**	0.10 --- -0.04**	0.10 --- -0.04**	0.10 --- -0.04**

gpd - gallons per day.
* Combined yield capacity of both current and proposed water supply(s).
** Calculated by current maximum yield capacity minus projected water demands.
*** Calculated by current and proposed maximum yield capacity minus projected water demands.
\+ Surplus water supply, mgd.
\- Water supply deficiency (mgd).

COMMENTS

- 1) Does not include Minisink Rubber Co. Well
- 2) Not adequate for summer peak estimated at 100,000 gpd

TABLE 5

REGIONAL GROUND-WATER STUDY
TOWN OF MINISINK
ORANGE COUNTY, NEW YORK

Petroleum Bulk Storage Facilities

Facility Name	Location	Municipality
ASL Industries, Inc.	First Avenue	Unionville
Honeywells Farm	RD 1 Box 402	Westtown