GORICK CONSTRUCTION AND DEMOLITION LANDFILL
TOWN OF KIRKWOOD, BROOME COUNTY
(ID 704019)

INTERIM REMEDIAL MEASURES

(Recommended Alternatives)

PROGRAM REVIEW
01/31/90

Central Remedial Projects Section
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation

Raymond E. Lupe, P.E., Chief
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Consultant: URS Consultants, Inc.

MAY 23 1989

GORICK DUMP

CHRONOLOGY

1959	- Gorick Dump begins operation.
1976	- Town of Kirkwood installs Water Supply Wells #1 and #2.
1981	- Contamination of Well #1 with low ppb Volatile Organic Contaminants noted. Within 50 ppb State guidance.
1986	- Town installs Well #3.
1986	- USGS Study Report issued. Wells installed by Gorick Dump in 1983-84.
October 1986	- NYSDEC samples USGS wells at Gorick Dump in cooperation with Town Engineer.
February 1986	- USGS Well GS-12 sampled. TCE 45 ppb and 48 ppb trans-1,2-dichloroethene.
October 27, 1987	- Matter referred from Region 7 to DEE, Site classified as a "2a".
December 1, 1987	- Meeting with Gorick (PRP) regarding its conduct of a site investigation (Phase II-Plus) and interim site clean-up measures. Kirkwood officials in attendance.
December 11, 1987	- DEE letter outlines objectives of investigation and of IRMs which should be conducted on-site. Kirkwood officials copied on letter.
April 9, 1988	- Kirkwood municipal well #3 shut down. Contaminated with 10 ppb TCE. Kirkwood Town Board decides to purchase stripper as interim measure.
April 1988	- DEC water engineer assists Town of Kirkwood in applying for emergency SPEDES permit to pump dirty well #3 to waste. This acts as an IRM and protects remaining drinking water well.
April 29, 1988	- DEE letter insists that PRP pay for installation of seven monitoring wells at toe of landfill and around municipal well.
May - June, 1988	- Town installs additional monitoring wells because of delays from Gorick in negotiations.

June 14, 1988 - Meeting with Gorick to discuss expanded investigation and work plan in light of the more significant off-site impacts, i.e. municipal well contamination. New work plan requirements outlined in 6/17/89 letter.

August 9, 1988 - DEE letter to PRP outlining major deficiencies in revised work plan including failure to evaluate impact of site on Kirkwood well field and demanding information on hazardous waste disposal on-site.

August 23, 1988 - DEC samples new wells installed at toe of dump to evaluate source of plume and extent of contamination. Gorick provides inadequate response to request for information on disposal activities.

October 1988 - DEE forwards results from August sampling to DOH, PRP and Town. DOH asked to ensure that drinking water supply and quality is preserved. Total VOCs 600 ppb with TCE at 430 ppb. Monitoring well by #3 also contaminated. Results indicate Gorick likely source of contamination.

November 3, 1988 - Cease & Desist Order served on Gorick - landfill operation ceased immediately thereafter. DEE letter informs Gorick that site will probably be upgraded to a class "2" and a full RI/FS work plan and Consent Order would be required.

November 15, 1988 - DEE serves Gorick with Subpoena to appear for deposition. DEE requests BECI initiate investigation to identify other PRPs at this site.

November 16, 1988 - DEE, regional staff and DOH meet with Town of Kirkwood officials to discuss continued DEC enforcement at site. Region initiates paperwork for reclassification of site to a "2".

December 22, 1988 - Gorick deposed by DEE attorney regarding past disposal practices and to identify other PRPs. Subpoena Duces Tecum served on Gorick.

January 20, 1989 - DEE letter informs Gorick that reclassification is imminent and that RI/FS Order will be required.

February 3, 1989 - Gorick served with notice that site has been classified as a "2".

February 1989 - Town given conditional approval by NYSDOH to operate air stripper.

March 1, 1989	- DEE notices Gorick to sign an Order or submit approvable work plan within 30 days or case will be referred to Superfund.
March 9, 1989	- DEE sends second notice letter to Gorick. DEE receives no reply.
March 18, 1989	- DEE sends third notice letter to Gorick. DEE receives no reply.
April 7, 1989	- DEE refers site to DHWR for State Superfund RI/FS.
May 3, 1989	- DHWR accepts site for state-funded RI/FS.

GORICK C & D LANDFILL
IRM
PROGRAM REVIEW

RAW WATER SUPPLY:

1977 Town developed two-1,000 gpm wells between Gorick Landfill and Susquehanna R.

1,000 gpm WTP installed to treat groundwater for iron and manganese (greensand filters with post-chlorination)

1985 Town developed additional 2,000 gpm well
Analytical results indicated that the well was impacted by the landfill

1988 3rd well removed from service due to increased levels of TCE contamination

Well # 1 left as sole source of water supply

1989 8 foot diameter, 40 foot high air stripper designed for a flow of 1000 gpm and 100 ppm TCE was installed by the Town.

Well # 3 placed back into service. Well # 1 to be used as a backup source of water supply.

*** ANALYTICAL RESULTS OF WELLS ARE PRESENTED IN ATTACHED TABLE ***

TRANSMISSION SYSTEM:

Prior to 1985	Well # 1 and # 2 supplied water directly to the water treatment plant and then to the distribution system.
1985 thru '88	Well # 1 and # 2 supplied water directly to the water treatment plant and then to the distribution system. Well # 3 supplied water directly to the distribution system after chlorination.
1988	(same as prior to 1985)
1989 thru present	Well # 3 supplied to 1000 gpm water treatment plant and air stripper. Well # 1 used as backup.

GOAL OF INTERIM REMEDIAL MEASURE:

To supply the needs of the community in the interim until a RI/FS can be conducted at the GORICK LANDFILL and long-term remedial measures can be identified, investigated, and properly evaluated. The goals of the RI/FS should be taken into account in designing the IRM in order not to increase the final costs of the project.

NEEDS OF THE COMMUNITY:

URS Consultants has evaluated the needs of the community. Monthly average pumping rates and water billings for the Kirkwood public water supply are tabulated an attached table.

Average daily pumping rate (1989) 1.26 mgd (875gpm/24 hr period)
Industrial demand (approximately 3/4 of the usage)
Average flow rates on weekdays is approx. 1,100 gpm per 20 hrs pumping or/ 1,300 gpm with the pumping duration averaging 16 hrs/day
4 reservoirs in distribution system (total combined capacity 2.55 million gallons)
Required industrial fire flow storage capacity (1.8 million gallons)

URS Consultants recommends that a 2000 gpm peak demand rate be used in the IRM design. The design of the IRM will be designed to meet a 2000 gpm demand rate.

IRM RECOMMENDATIONS:

ALTERNATIVE # 1 **ADDITIONAL SOURCES OF WATER**
REJECTED: ALTERNATIVE SOURCE QUANTITY HAS NOT BEEN FOUND

ALTERNATIVE # 2 **EXPAND PUMPING CAPACITY FOR WELLS # 1 AND # 3**
REJECTED: QUANTITY IS NOT A PROBLEM

ALTERNATIVE # 3 **EXPAND CAPACITY OF THE EXISTING WTP**
REJECTED: COST FOR IMPLEMENTATION $3.19M

6 GREENSAND FILTERS	$2,600,000
AIR STRIPPER	470,000
2,500 FEET OF FORCEMAIN	90,000
TWO-1,000 GPM DISTR. PUMPS	30,000
	$3,190,000

ALTERNATIVE # 4 **SEPARATE TREATMENT AT WELL # 3**
RECOMMENDED: $980,000 TOTAL PROJECT COST

ALTERNATIVE # 5 **PURCHASE WATER FROM CITY OF BINGHAMTON**
REJECTED: COST INHIBITED ($1.34/1000 gal)
(Recommended for Contingency)

ALTERNATIVE # 6 **USE EXISTING FILTERS FOR WELL # 1 AND AIR-STRIPPER FOR WELL # 3**
REJECTED: Increased capacity can be only guaranteed if both wells are producing and the WTP is fully operational at all times. Should one of the system components be taken out of service, only 1,000 gpm could be supplied.

ALTERNATIVE # 7 **INDUSTRIAL WATER CONSERVATION AND REUSE**
REJECTED: This alternative should be used in conjunction with another, however, should not be used as a sole solution.

ADDITIONAL INTERIM REMEDIAL ALTERNATIVES SUGGESTED:

1. GRANULAR ACTIVATED CARBON FILTER

2. PUMPING/EXTRACTION WELL

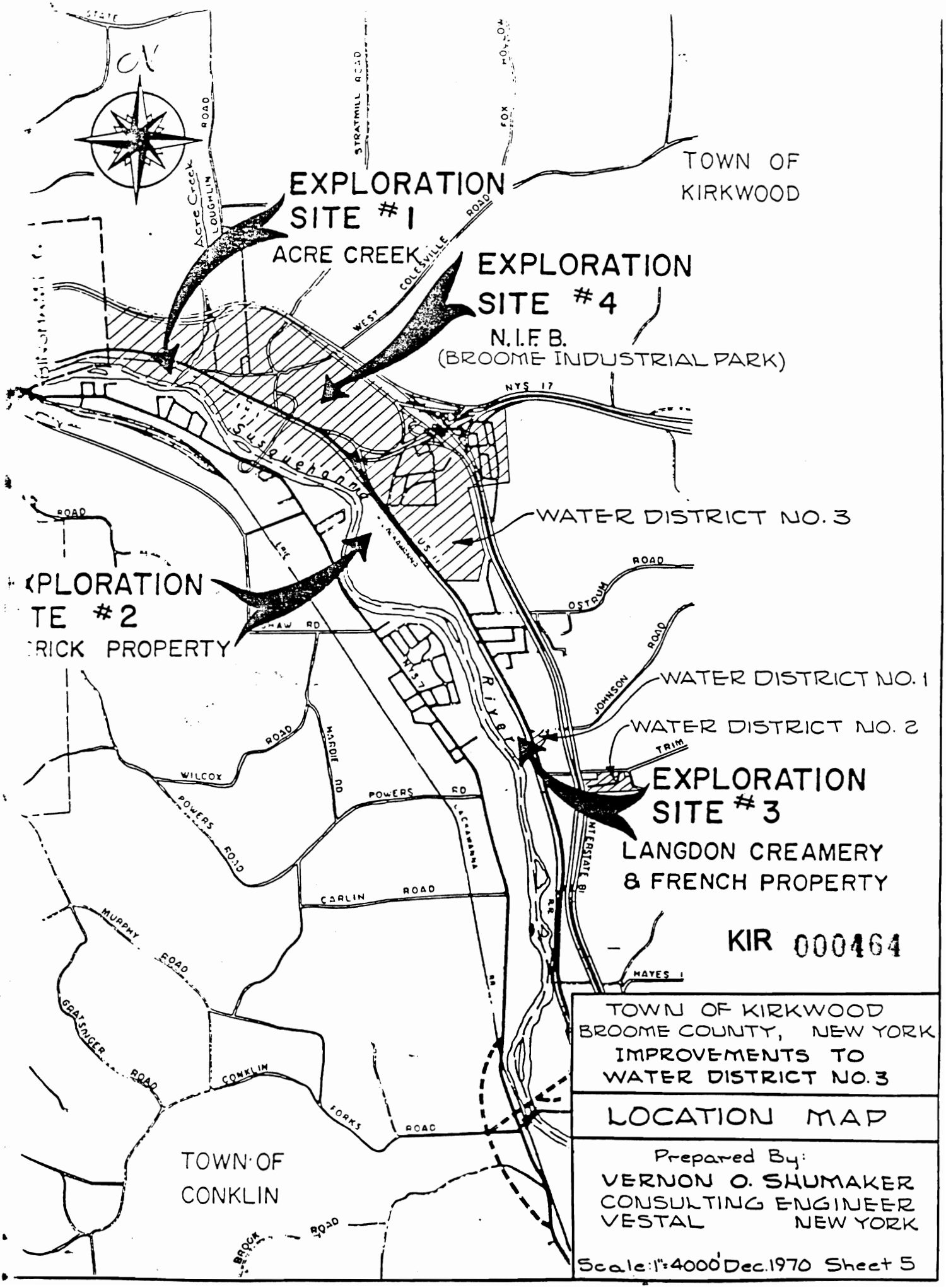
3. 2,000 GPM AIR STRIPPER UNIT INSTALLED AT THE WTP FOR TREATMENT OF WELL # 3.

GREENSAND FILTERS REMAIN THE SAME.

CONTINGENCY PLAN

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

CITIZEN PARTICIPATION

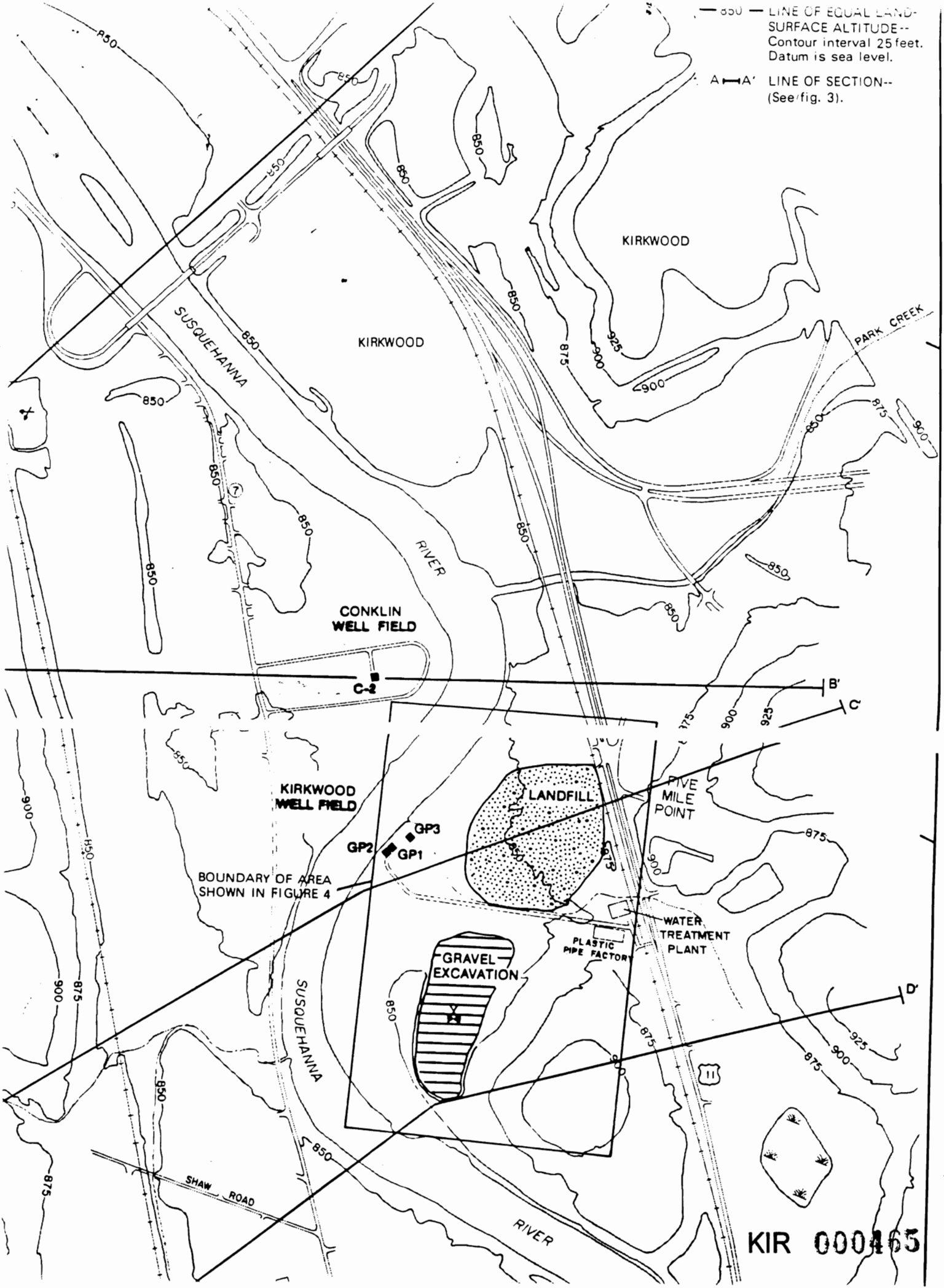


TOWN OF KIRKWOOD
BROOME COUNTY, NEW YORK
IMPROVEMENTS TO WATER DISTRICT NO. 3

LOCATION MAP

Prepared By:
VERNON O. SHUMAKER
CONSULTING ENGINEER
VESTAL NEW YORK

Scale: 1"=4000' Dec. 1970 Sheet 5


850 — LINE OF EQUAL LAND-SURFACE ALTITUDE-- Contour interval 25 feet. Datum is sea level.
A — A' LINE OF SECTION-- (See fig. 3).
KIRKWOOD
KIRKWOOD
SUSQUEHANNA
RIVER
PARK CREEK
CONKLIN WELL FIELD
C-2
B'
C'
KIRKWOOD WELL FIELD
GP3
GP2
GP1
BOUNDARY OF AREA SHOWN IN FIGURE 4
LANDFILL
FIVE MILE POINT
WATER TREATMENT PLANT
PLASTIC PIPE FACTORY
GRAVEL EXCAVATION
D'
SUSQUEHANNA
SHAW ROAD
RIVER
11
850
875
900
925

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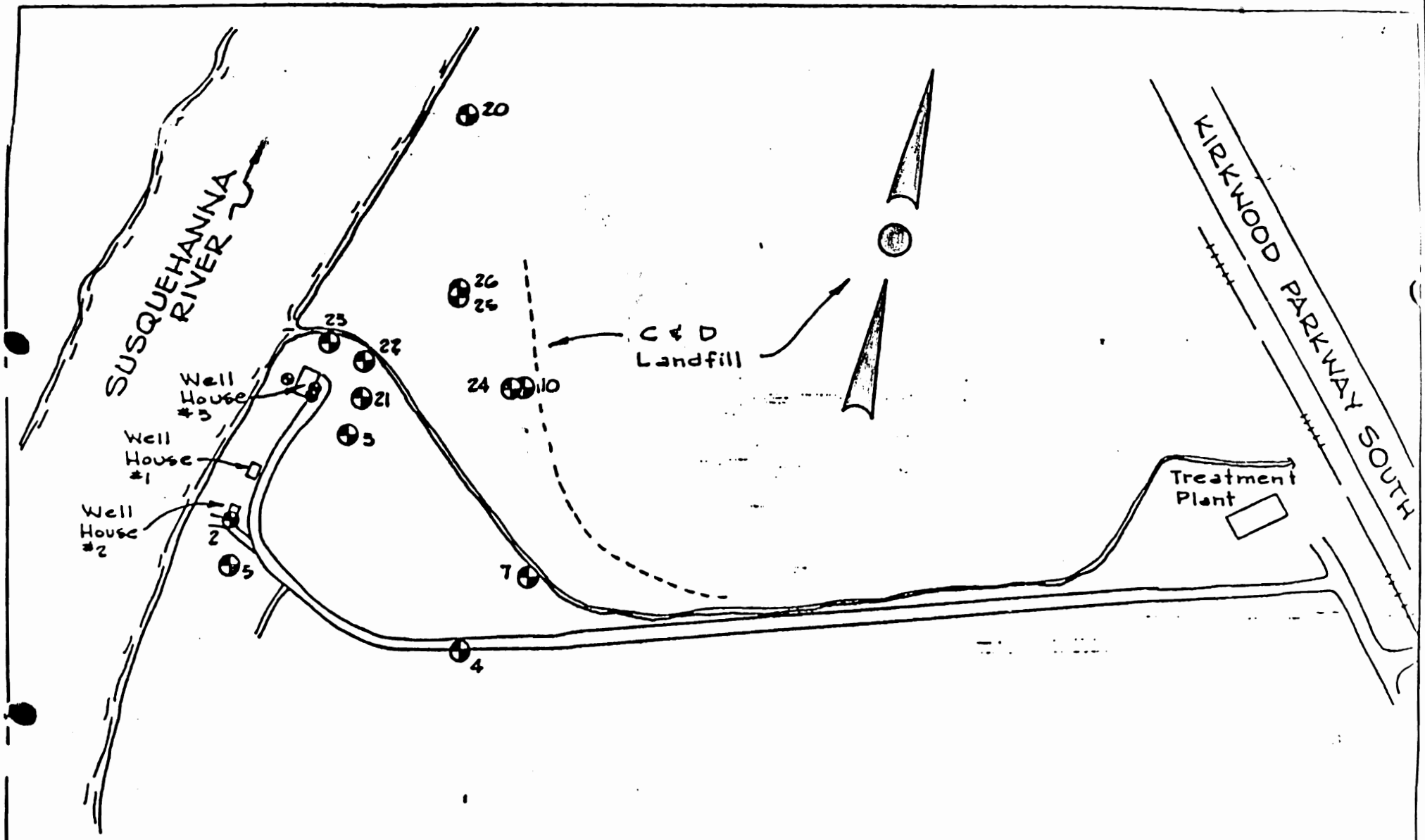


KIR 000466

LAKE ENGINEERING

Engineering Consultant

607 • 724 • 5228

87 ROBINSON STREET BINGHAMTON, N.Y. 13904

TOWN OF KIRKWOOD

TEST WELL LOCATIONS

SCALE: 1" = 200'

JULY 1988

TABLE 1

SUMMARY OF WATER QUALITY DATA

DATE	CONCENTRATION WELL 1				CONCENTRATION WELL 3			
	TCE	1,2-DCE	MANGANESE	IRON	TCE	1,2-DCE	MANGANESE	IRON
06/14/8	2							
09/29/8	2							
08/22/8	3							
09/15/8	3							
07/16/87					4,4			
08/31/87					7			
09/17/87					7	5		
10/04/87					4			
01/14/88					4,9			
01/29/88					8			
02/25/88					9			
03/08/88					12,10			
03/16/88					7			
03/23/88					5			
03/30/88					16			
04/07/88					6			
04/12/88					9	14		
04/20/8	3				33,16			
04/21/88		2			15	11		
04/23/88					6			
04/25/8	8,6							
04/27/8	5				5			
04/28/8	2,2,6							
05/03/8	6							
05/05/8	2,4,5,6,7		0.019	0.014	44,23,48		0.01	0.03
05/09/88					30,35,37			
05/13/88					10	6		
05/16/88					9			
05/20/88					18			
05/23/88					6			
05/26/88					6			
05/31/88					8			
06/02/88					7			
06/10/88					10			

NOTE: ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ppb)

TABLE 1

SUMMARY OF WATER QUALITY DATA

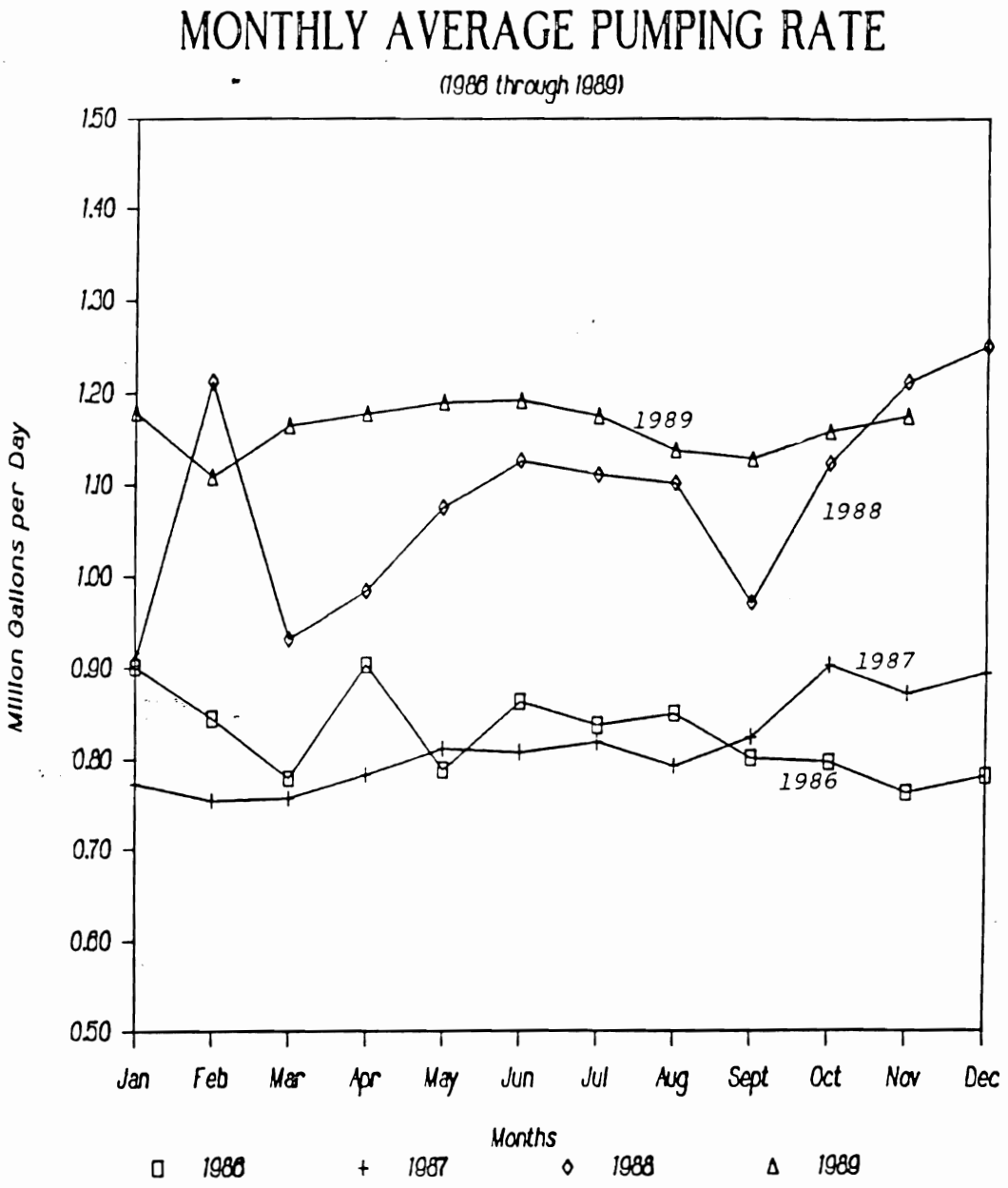
DATE	CONCENTRATION WELL 1				CONCENTRATION WELL 3			
	TCE	1,2-DCE	MANGANESE	IRON	TCE	1,2-DCE	MANGANESE	IRON
06/13/88					11			
06/17/88					6			
06/20/88					8			
06/24/88					4			
06/30/88					11			
07/25/88					6			
08/08/88					8			
08/22/88					5			
09/06/88					5			
09/21/88					14			
10/04/88					4.9			
10/14/88					4.9			
10/17/88					12			
10/31/88					11			
11/28/88					6.4			
12/12/88					8			
01/10/89					5			
01/23/89					6			
02/20/89					8			
02/25/89					10			
02/28/89					7			
03/16/89					8			
03/30/89					3.5,6.1	0.8		
04/07/89					8.7	2.4		
04/14/89					7.3			
04/21/89					6.5,8.1	2.1		
05/19/89					7.9,7.9	4		

NOTE: ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ppb)

TABLE 2
WATER PUMPING DATA
KIRKWOOD, NEW YORK

YEAR	MONTH	OPERATING WELL NUMBER	WATER PUMPED		WATER BILLED	
			MONTHLY (MIL OF GAL)	DAILY (MIL OF GAL)	VOLUME (MIL OF GAL)	% OF PUMPAGE
	January	1 & 3	27.92	0.90		
	February	1 & 3	23.62	0.84		
1	March	1 & 3	24.15	0.78		
	April	1 & 3	27.12	0.90		
9	May	1 & 3	24.47	0.79		
	June	1 & 3	25.89	0.86	–	–
8	July	1 & 3	25.94	0.84		
	August	1 & 3	26.36	0.85		
6	September	1 & 3	24.07	0.80		
	October	1 & 3	24.75	0.80		
	November	1 & 3	22.90	0.76		
	December	1 & 3	24.24	0.78	–	–
	January	1 & 3	23.95	0.77		
	February	1 & 3	21.10	0.75		
1	March	1 & 3	23.48	0.76		
	April	1 & 3	23.48	0.78		
9	May	1 & 3	25.18	0.81		
	June	1 & 3	24.25	0.81	–	–
8	July	1 & 3	25.37	0.82		
	August	1 & 3	24.57	0.79		
7	September	1 & 3	24.74	0.83		
	October	1 & 3	27.99	0.90		
	November	1 & 3	26.15	0.87		
	December	1 & 3	27.72	0.89	170.99	98.3
	January	1 & 3	28.12	0.91		
	February	1 & 3	35.14	1.21		
1	March	1 & 3	28.89	0.93		
	April	1 & 3	29.55	0.99		
9	May	1	33.35	1.08		
	June	1	33.80	1.13	188.46	96.9
8	July	3	34.45	1.11		
	August	1	34.18	1.10		
8	September	1	29.17	0.97		
	October	1	34.85	1.12		
	November	1	36.35	1.21		
	December	1	38.76	1.25	174.68	81.8
	January	1	36.54	1.18		
	February	1	31.04	1.11		
1	March	1	36.12	1.17		
	April	1	35.35	1.18		
9	May	3	36.90	1.19		
	June	3	35.75	1.19	178.66	83.6
8	July	3	36.47	1.18		
	August	3	35.28	1.14		
9	September	3	33.86	1.13		
	October	3	35.92	1.16		
	November	3	35.27	1.18		

FIGURE 1


MONTHLY AVERAGE PUMPING RATE
(1986 through 1989)
Million Gallons per Day
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
1989
1988
1987
1986
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
Months
1986
1987
1988
1989