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CONTAMINANT SOURCE INVESTIGATION

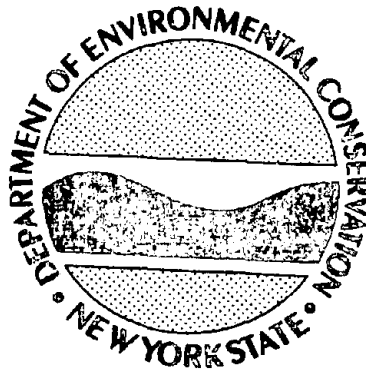
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ADDENDUM NO. 1

JOHNSON CITY WELLFIELD

JOHNSON CITY WELLFIELD
JOHNSON CITY (C)

BROOME (C)



Prepared for:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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DIVISION OF HAZARDOUS WASTE REMEDIATION

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**CONTAMINANT SOURCE INVESTIGATION
ADDENDUM NO. 1
JOHNSON CITY WELLFIELD**

1.0 INTRODUCTION

URS Consultants, Inc., presented initial findings of the Contaminant Source Investigation at the Johnson City Wellfield to the New York State Department of Environmental Conservation (NYSDEC) on May 22, 1992. A site location map is presented as Figure 1-1. This work was conducted under an immediate engineering services contract requested by the NYSDEC to address organic pollutants found in two of the municipal groundwater wells. As a result of the initial study, additional investigations were recommended to further define the extent of chemical contamination and other potential sources.

On October 22, 1992, the NYSDEC approved additional hydrogeological and analytical investigations. This report, Addendum No. 1, presents the findings, conclusions, and recommendations of the additional characterization.

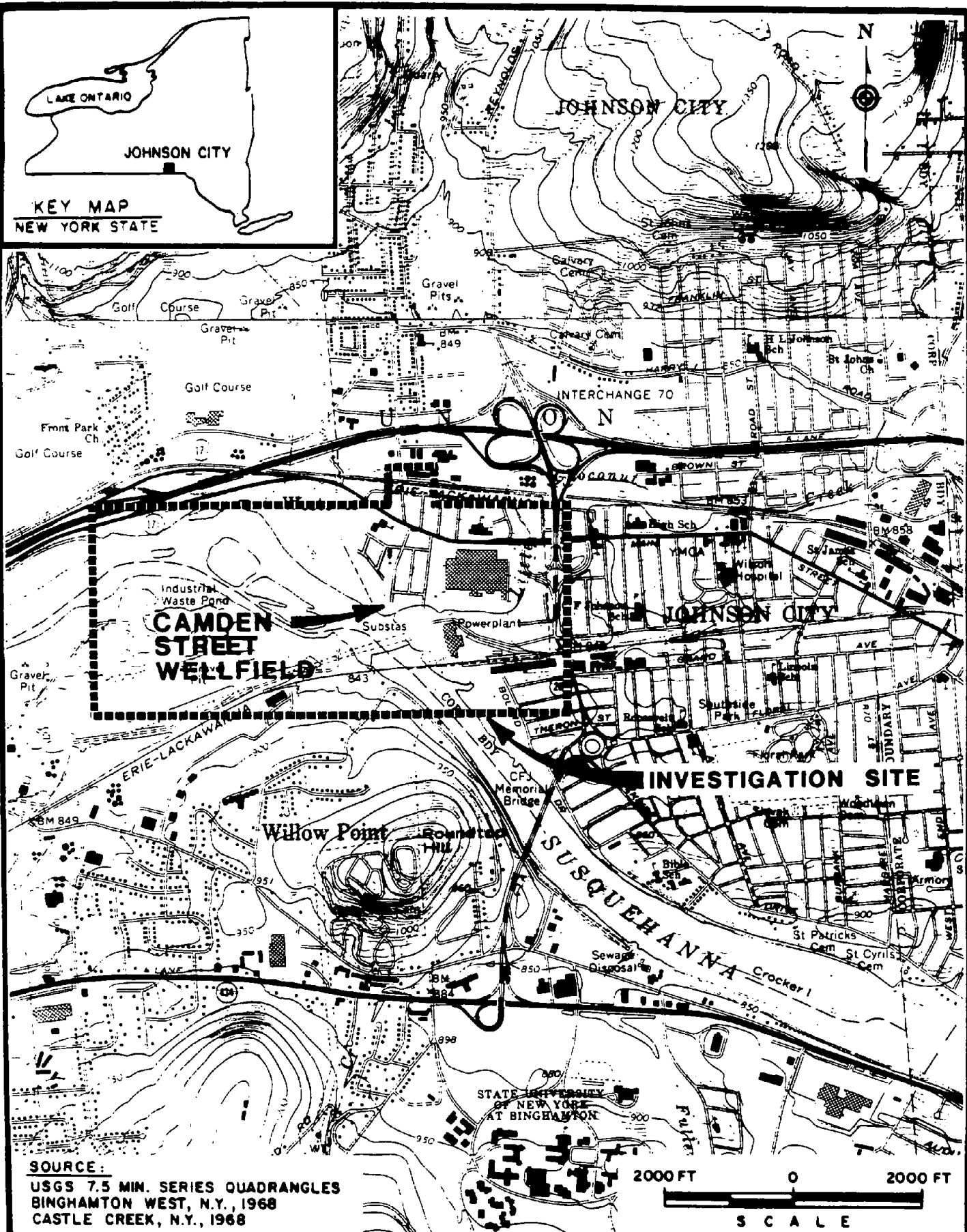
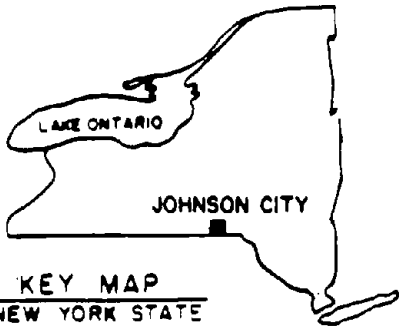
2.0 PURPOSE AND SCOPE

The purpose of additional investigation near the Johnson City Wellfield is to provide data and information defining the source(s) of volatile organic and metals concentrations within groundwater found to exceed New York State Ambient Water Quality Standards and Guidelines 1990. The initial investigation established increased concentrations of organic contaminants north of the Camden Street Wellfield. For this investigation, an additional four monitoring wells were installed at four different sites to intercept potential contaminant plumes (Fig. 2-1).

Prior to monitoring well placement, sites selected by NYSDEC were screened for volatile organic contaminants using a portable gas chromatograph (GC). Seven sites were selected to assess potential nearby or upgradient sources of contaminant migration. Sampling economies realized during field activity allowed additional water table samples to be collected at an eighth site.

The scope of work for Addendum No. 1 is composed of four tasks as outlined below:

1. Field gas chromatograph (GC) analysis of water table samples collected at selected sites near the wellfield.
2. Installation and surveying of three (3) additional shallow groundwater monitoring wells and one (1) intermediate depth monitoring well.
3. Sampling and analyses of all monitoring wells installed under URS supervision during the wellfield investigations; and
4. Collection of a set of nearly contemporaneous groundwater level measurements in the monitoring wells which were sampled, for the purpose of preparing potentiometric maps.



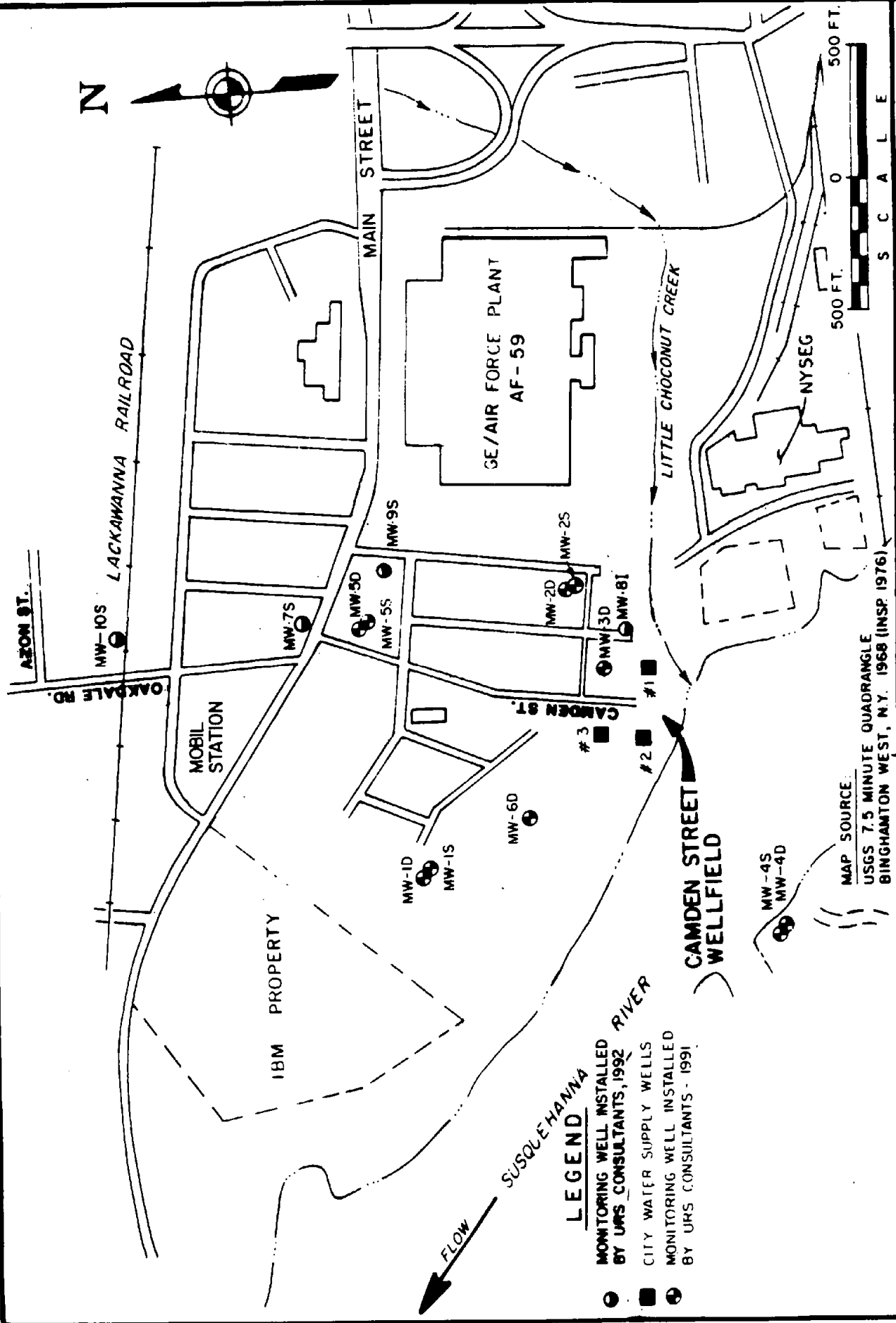
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JOHNSON CITY-CAMDEN ST. WELLFIELD
SITE LOCATION MAP

FIGURE 1-1

A-474I



- LEGEND**
- MONITORING WELL INSTALLED BY URS CONSULTANTS, 1992
 - CITY WATER SUPPLY WELLS
 - MONITORING WELL INSTALLED BY URS CONSULTANTS - 1991

MAP SOURCE:
 USGS 7.5 MINUTE QUADRANGLE
 BINGHAMTON WEST, N.Y. 1968 (INSP. 1976)



**JOHNSON CITY
 CONTAMINANT SOURCE INVESTIGATION WELL LOCATIONS**

FIGURE 2-1

3.0 ADDITIONAL SITE CHARACTERIZATION

3.1 Geoprobe Water Table Sampling

Water table samples were collected using a Geoprobe sampling system. The Geoprobe equipment consisted of a 12-inch slotted rod equipped with a solid cone tip and three foot hollow steel rods. The rods were advanced using a hydraulic press mounted on a utility van. Samples were then collected from the water table surface using 1/4 inch polyethylene tubing. A total of 58 water table samples were collected from eight locations and analyzed, in the field, for 1,1,1-Trichloroethane (TCA) (Figure 3-1). Two samples were sent to the laboratory by the NYSDEC to confirm the field analysis.

3.2 Field Gas Chromatograph Analyses

Field analyses for all samples utilized a Photovac 10S55 gas chromatograph (GC) configured with a temperature programmable isothermal oven and CP-SIL 5 capillary column. The carrier gas is ultra zero air, and the detector is a photoionization detector with a 11.7 eV lamp. During field analysis the isothermal oven was calibrated at 30 degrees Centigrade (°C) and the flow rate at 10 ml/minute. The gain was set at 1,000, chart speed 0.5 cm/min, minimum area at 200 mV sec, analysis time was 300 seconds, and 100 µl injection volume.

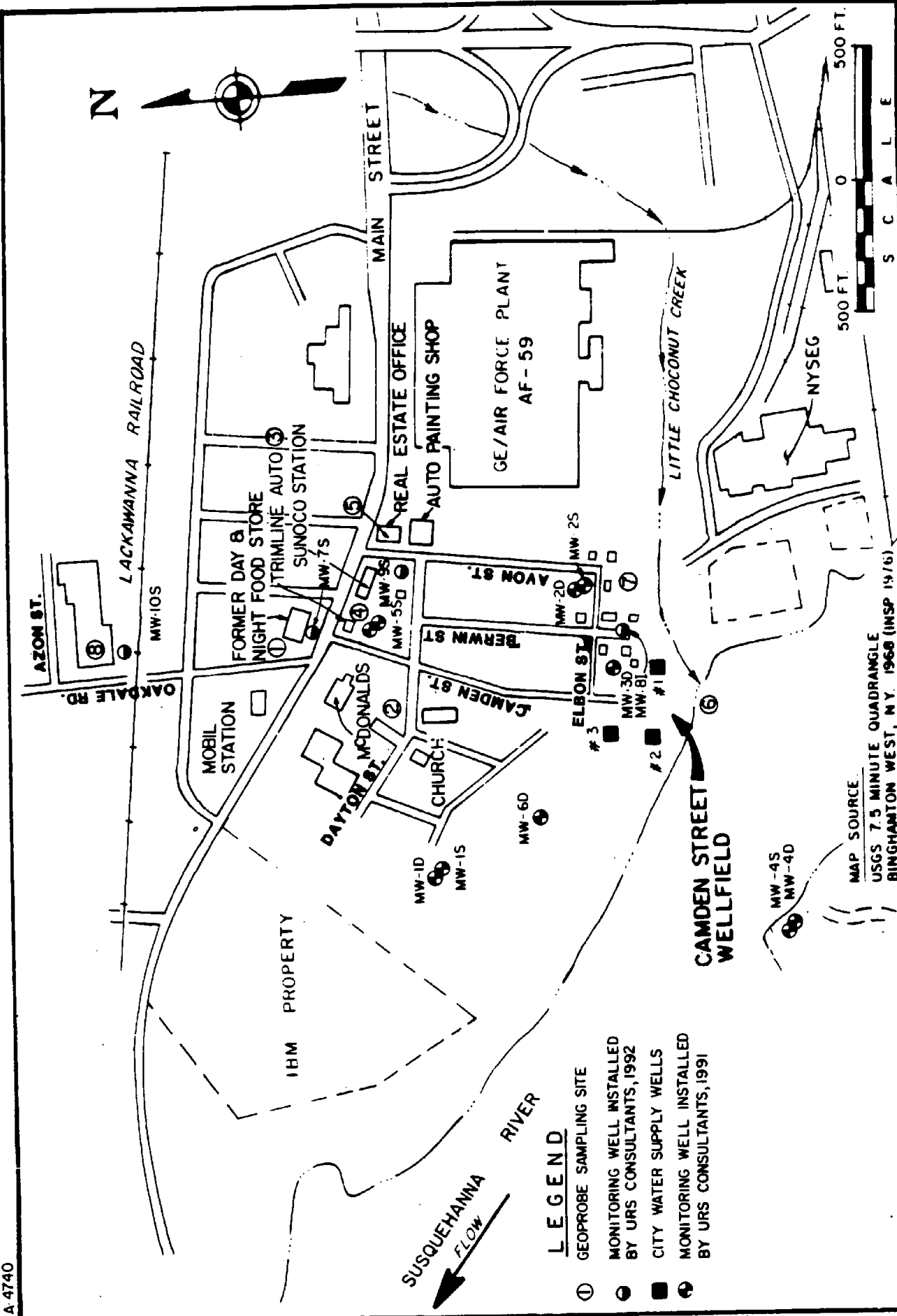
3.2.1 Standard Preparation

A water standard was prepared by dilution of the stock standard (99.9 percent pure) to a 1,000 mg/L intermediate standard in methanol using the following equation:

$$1000 \text{ mg/L of 1,1,1-trichloroethane (TCA)} = \frac{1000\mu\text{l}}{1 \text{ ml}} \times \frac{1\text{ml}}{1.3376} \times \frac{1\text{g}}{1000\text{mg}} \times \frac{1\text{mg}}{1000\mu\text{g}} \times \frac{0.791}{1 \text{ ml}} \times 10\text{ml} \times 1000 \text{ ppm} = 5.913$$

5.9 µl of TCA QS 10 ml of methanol - 1000 µg/L TCA

A-4740



- LEGEND**
- ① GEOPROBE SAMPLING SITE
 - MONITORING WELL INSTALLED BY URS CONSULTANTS, 1992
 - CITY WATER SUPPLY WELLS
 - ⊙ MONITORING WELL INSTALLED BY URS CONSULTANTS, 1991

MAP SOURCE:
 USGS 7.5 MINUTE QUADRANGLE
 BINGHAMTON WEST, NY, 1968 (INSP 1976)

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GEOPROBE SAMPLING SITES FOR GC ANALYSIS

FIGURE 3-1

The intermediate standard was further diluted in water to prepare the daily calibration standard as follows:

20 μ l of 1000 mg/L TCA QS 20 ml in water = 1000 μ g/L

2 μ l of 1000 μ g/L TCA QS 20 ml in water = 100 μ g/L

1 μ l of 1000 μ g/L TCA QS 20 ml in water = 50 μ g/L

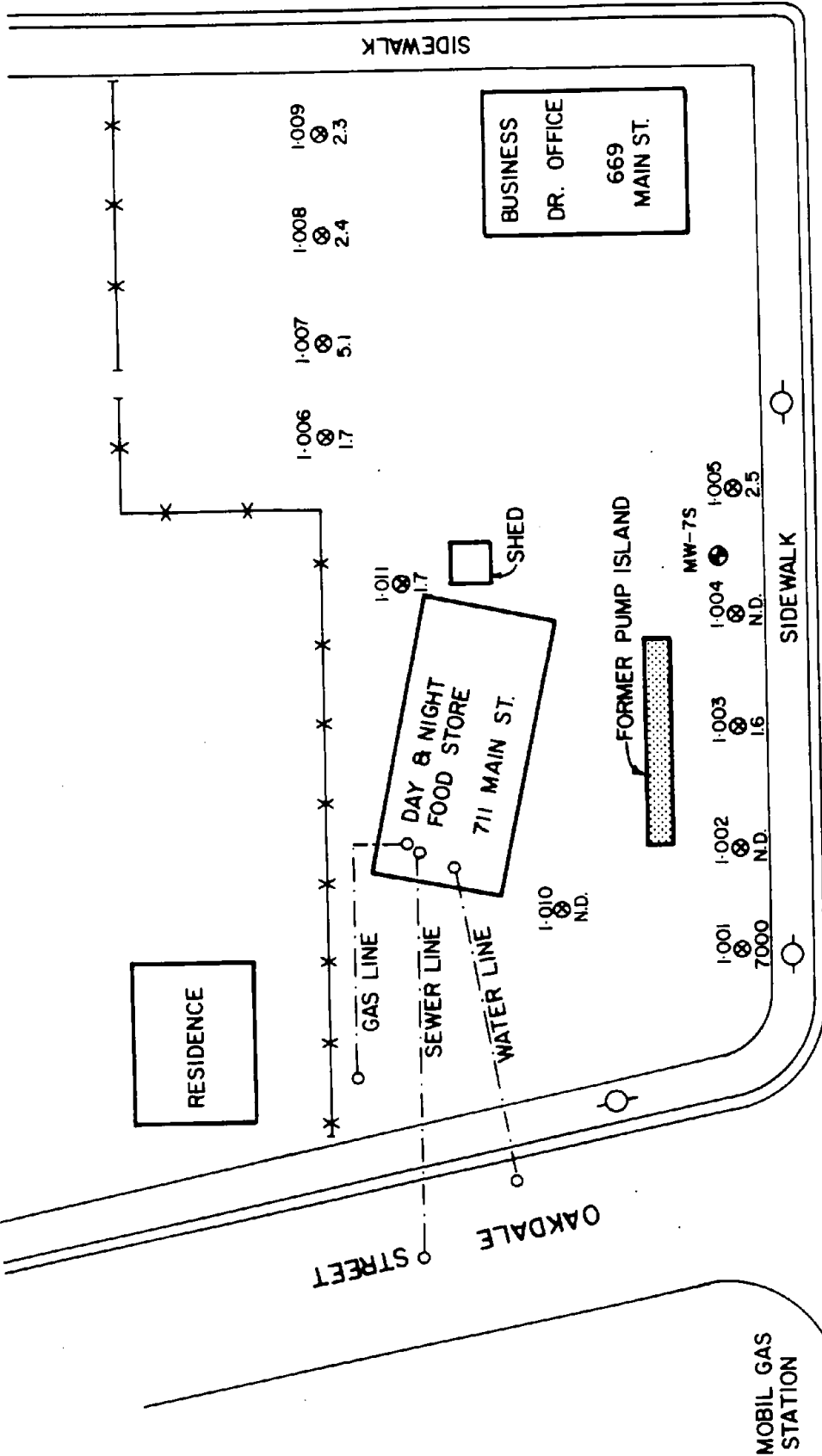
200 μ l of 100 μ g/L TCA QS 20 ml in water = 10.0 μ g/L

3.2.2 Sample Analyses

The Geoprobe water table samples were collected into 40 ml VOA vials (with no head space) and kept inverted on ice prior to analysis. Immediately before analysis the samples were well mixed, then the cap of sample vial was removed and 20 ml of sample was discarded. The sample was then placed into an ultrasonic water bath set at 40°C for five minutes before injecting 100 μ l of head space onto the GC column. All samples were consistently handled in this manner throughout the field program. A blank (20 ml of H₂O in a 40 ml VOA vial) and 10.0 μ g/L calibration standard was analyzed every tenth sample or two hours. The calibration standard was reprepared approximately every four hours or when degradation exceeded 20 percent of the true value. Spike and duplicate analyses were also performed as part of the daily QC program.

3.2.3 Geoprobe Sampling Results

Results of the Geoprobe sampling and analysis indicated two areas of elevated TCA concentrations ($> 5 \mu$ g/L). Area 1, the Day and Night Food Store, was sampled at 11 locations around the property (Figure 3-2). Sample ID 1-001 showed a concentration of TCA at 7,000 ppb. This sample chromatogram also had several other peaks (16) which could not be quantified. A sample was sent to the laboratory for confirmation of the field work by the NYSDEC. The laboratory reported values of 10,500 ppb for benzene, 9,310 ppb toluene, 4,400 ppb of total xylenes, and $< 1,000$ ppb of TCA. Laboratory results are presented in Appendix E. The difference between the laboratory results and the field results (< 1000 ppb laboratory vs 7,000 ppb field for TCA) are probably due to the 16 unidentified compounds in the sample. The chromatogram had several peaks which were very close to each other and the sample had to be



LEGEND

- ⊗ GEOPROBE SAMPLE LOCATIONS
- ✕ FENCE LINE
- UTILITY POLES
- N.D. NOT DETECTABLE
- 1-001 GEOPROBE SAMPLE LOCATIONS MCDONALDS WITH I.D. CODE SHOWN ABOVE AND VALUE OF TCA IN PPB BELOW.
- ⊕ URS MONITORING WELL

TRIMLINE AUTOMOTIVE

NOTE: NOT TO SCALE



GEOPROBE SAMPLING SITE 1

FIGURE 3-2

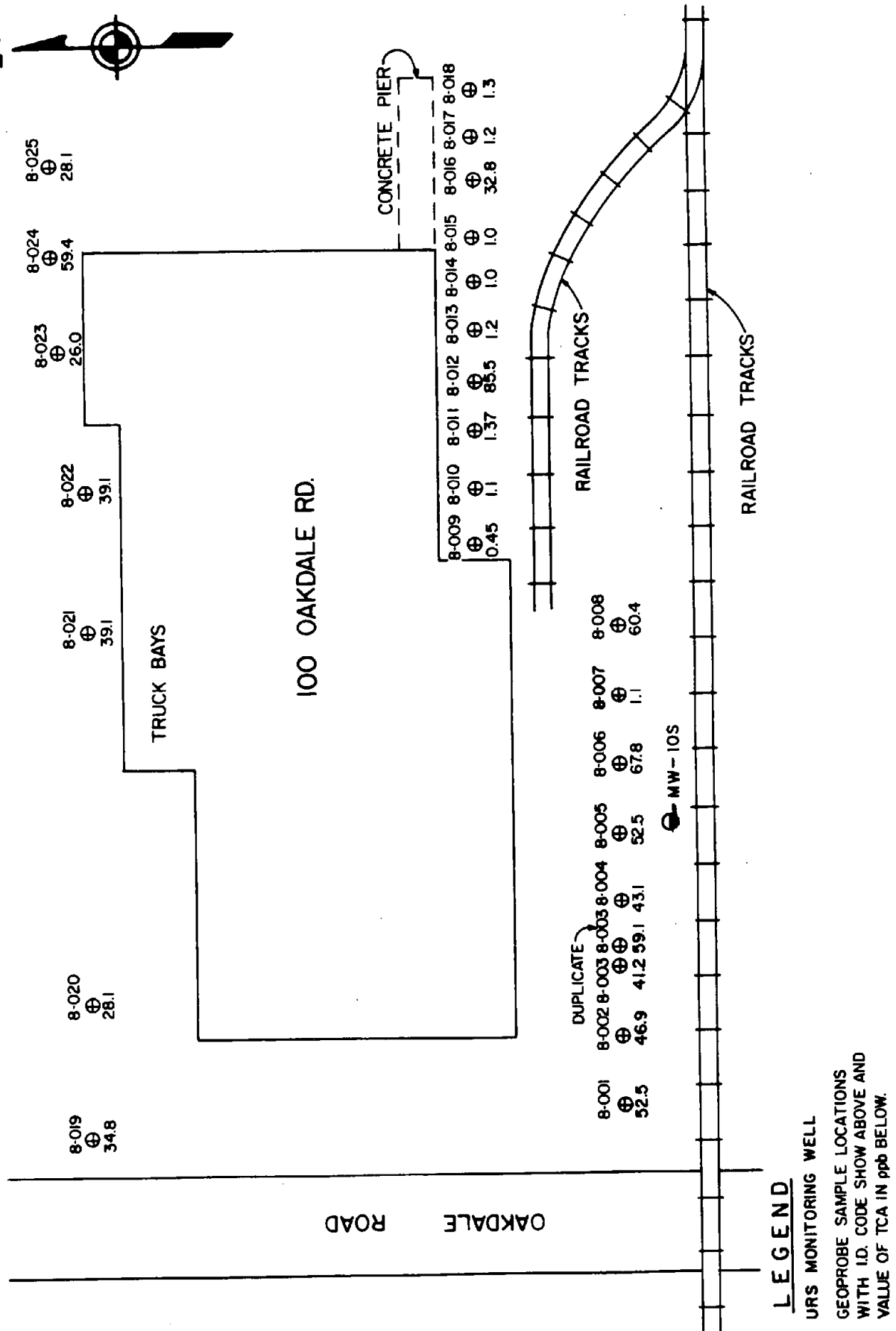
diluted 100 times to keep the peaks on scale. The integrator on the field GC identified two peaks as TCA that were in the same retention time window as TCA. For reporting purposes, the peak that was closest to the actual retention time was chosen for quantitation purposes. It is possible that there were other compounds conducted with the TCA which would elevate the reported quantity of TCA. However, without further study, only assumptions can be made.

The other area which showed elevated levels of TCA was area 8, located at 100 Oakdale Avenue, Figure 3-3. At this location, 25 sample points were tested around the north and south side of the building. Both sample lines showed elevated levels of TCA. At this site, sample ID 8-003D was sent to the laboratory by the NYSDEC for confirmation analysis. The laboratory reported a value of 41 ppb TCA and the field analysis showed 59 ppb of TCA. The laboratory results vs. field results confirms the presence of TCA.

3.3 Additional Monitoring Well Installation

Four additional wells were installed for the Johnson City Wellfield contaminant source investigation between November 17 and 25, 1992. Monitoring well MW-7S was located in the southeast corner of the parking lot of the former Day and Night Convenience Store on Main Street and Oakdale. Well MW-8I was installed at the south end of Berwin Street where the street terminates at an embankment to Little Choconut Creek, a tributary of the Susquehanna River. Well MW-9S was located in the yard of a private residence near the corner of Dayton and Azon Street. This location also lies directly behind the Sunoco Gas Station, which is on Main Street and Azon Street. The last well, MW-10S, was installed between the 100 Oakdale office building and the railroad tracks which travel east-west (Figure 2-2).

All wells were installed using 4-1/4-inch I.D. hollow-stem augers driven by a truck-mounted Mobile B-52 drilling rig. Schedule 40 PVC screens (10 slot) and riser were installed with a gravity-placed sand pack consisting of 4-Q ROK silica sand for each monitoring well. A two foot seal composed of hydrated bentonite pellets was placed above each sand pack and Portland cement mixed with gravel was used to grout to the ground surface in each well. The top of the riser in each well was secured with a locking cap and enclosed with a surface mount curb box which was set in concrete.



NOTE: NOT TO SCALE

LEGEND

- URS MONITORING WELL
- ⊕ GEOPROBE SAMPLE LOCATIONS WITH I.D. CODE SHOW ABOVE AND VALUE OF TCA IN ppb BELOW.

GEOPROBE SAMPLING SITE 8

FIGURE 3-3

At the three shallow locations, MW-7S, MW-9S, and MW-10S, screens were placed from two to three feet above the saturated zone encountered and extended between 10 to 20 feet below. At MW-9S, the screen was shortened to 10 feet due to the presence of clayey silt at a depth of approximately 30 feet. Twenty feet of screen was used at MW-10S to intercept a broader zone within the silty, sandy, gravel. For MW-7S, it was determined that 15 feet of screen was appropriate to monitor the shallow aquifer. Test boring logs and monitoring well construction details are presented in Appendix A.

Monitoring well MW-8I was designed as an intermediate-depth well to monitor the zone of saturation directly above the first confining unit encountered. A very tight, moist to dry, coarse, sandy clayey silt was encountered at about 60 feet underlying 30-35 feet of saturated silty sandy gravels and gravelly sands. A 25 foot screen was placed above the confining unit from 34.5 to 59.5 feet.

Upon completion, the monitoring wells were developed using a Waterra Hydrolift inertial pump which agitates the well column by surging water through the well screen and surrounding sand pack. The wells were initially developed on November 25, 1992, however, additional development was necessary during the week of December 1. Turbidity was reduced to less than 50 NTU in two of the wells (MW-9S and MW-8I). Additional well development did benefit MW-7S and MW-10S, however, the turbidity could not be lowered below the 50 NTU goal. Appendix B presents Development Logs.

3.4 Monitoring Well Sampling and Analysis

Fourteen monitoring wells installed for the contaminant source investigation to date were purged and sampled between December 14 and 17, 1992. Purging was completed following removal of three well volumes using a stainless steel bailer prior to sampling each well. During purging and sampling, pH, temperature (°C), conductivity (umho), and turbidity (NTU) measurements were recorded. Purging and sampling data are presented on Purging Logs in Appendix C and Well Sampling Field Sheets in Appendix D.

Groundwater samples from the 14 monitoring wells were analyzed for volatiles (EPA Method 524.2) and Target Analyte List (TAL) metals and cyanide by IEA, Inc. of Monroe, Connecticut. The analytical results are listed on Tables 4-1 and 4-3 and discussed in Section 4.0, Contamination Assessment.

3.5 Groundwater Level Measurements

On December 18, 1992, nearly contemporaneous water levels were measured for each of the 14 monitoring wells to provide data for potentiometric maps of the deep and shallow groundwater zones. The measured water levels, surface elevations, and water elevations are listed on Table 3-1.

The potentiometric maps presented on Figures 3-4 and 3-5 were prepared by contouring the water elevations measured in the shallow wells and deep wells, respectively. Groundwater flows at right angles to the potentiometric surface of each hydrogeologic unit. The shallow well potentiometric map (Figure 3-4) relates the character of migration pathways of the unconfined aquifer as they existed on December 18. The deep well potentiometric map (Figure 3-5) characterizes the lower portions of the aquifer below the first clay layer. Both maps show the influence of the Johnson City Wellfield creating a drawdown effect drawing water radially inward toward Well #2 as water is produced for municipal supply. The deep well map displays more pronounced drawdown due to the presence of the clay layer locally separating the upper and lower aquifer zones. The migration pathways of groundwater and associated movement of contaminants is important when comparing the concentrations of compounds found in the groundwater samples (See Section 4.0).

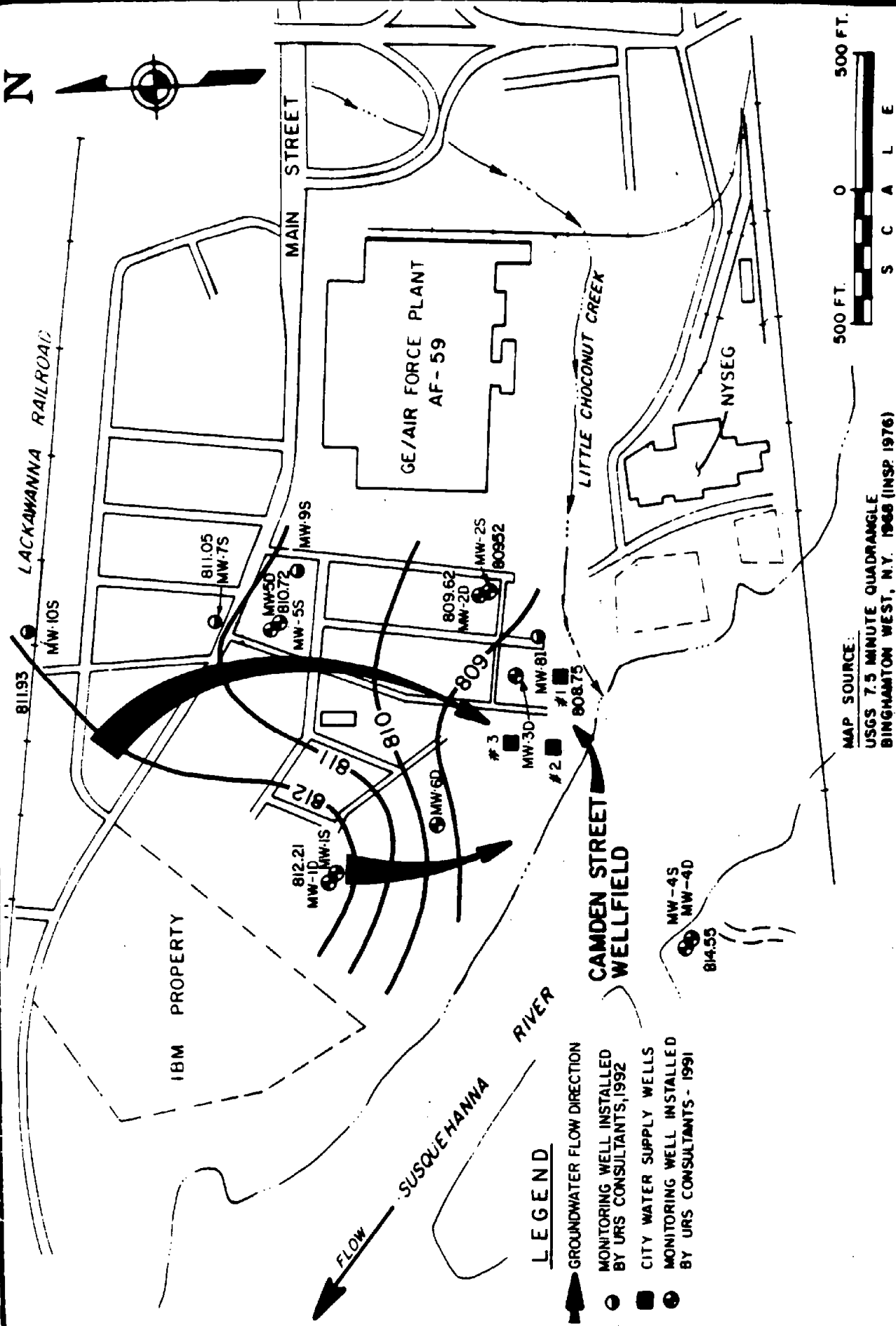
TABLE 3-1

SUMMARY OF WELL DEPTHS, WATER LEVELS (12-18-92) AND ELEVATIONS

WELL ID	WELL DEPTH	ELEV. T. RISER	WATER LEVEL	ELEV. W. LEVEL	ELEV. TOP SCREEN	SCREEN LENGTH
MW-1S	43.4	824.91	12.70	812.21	812.92	30.8
MW-1D	91.2	824.92	14.66	810.26	764.71	30.8
MW-2S	60.2	842.94	33.42	809.52	809.01	25.8
MW-2D	90.3	842.82	33.20	809.62	778.96	25.8
MW-3D	97.5	844.17	37.74	806.43	779.97	30.8
MW-4S	32.2	824.31	9.76	814.55	812.40	20.4
MW-4D	59.5	824.85	11.00	813.85	795.73	30.8
MW-5S	56.7	835.12	24.52	810.60	810.37	30.8
MW-5D	90.0	835.24	15.74	819.38	775.33	30.8
MW-6D	95.9	824.28	15.74	808.54	749.10	20.4
MW-7S	34.9	835.49	24.44	811.05	815.68	15.0
MW-8I	59.3	841.97	33.22	808.75	807.76	25.0
MW-9S	30.0	834.58	23.88	810.70	814.82	10.0
MW-10S	34.0	829.93	18.00	811.93	815.70	20.0

Note: All measurements given in feet.

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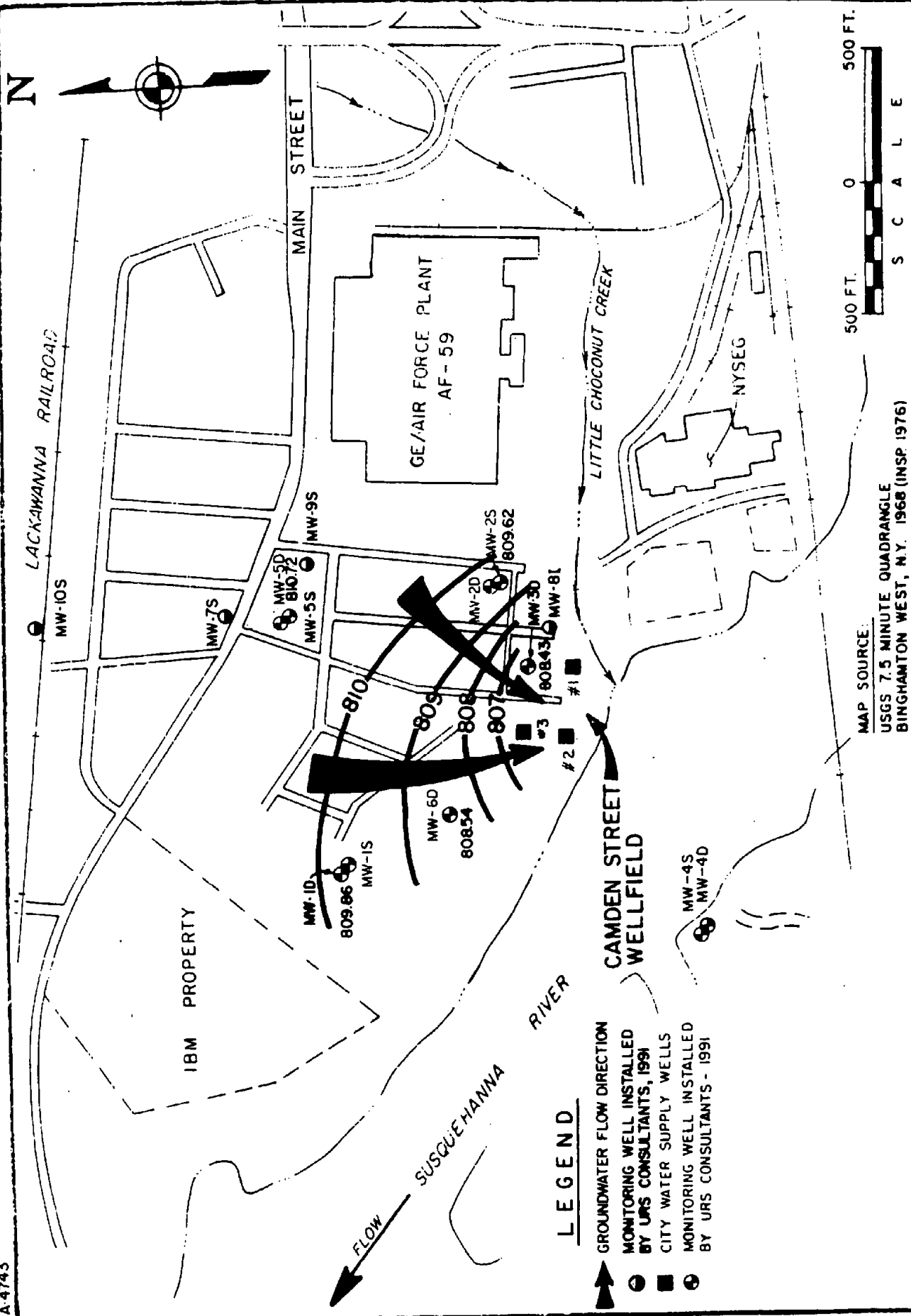
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**JOHNSON CITY
GROUNDWATER ELEVATIONS - SHALLOW WELLS 12-18-92**

FIGURE 3-4

MAP SOURCE:
USGS 7.5 MINUTE QUADRANGLE
BINGHAMTON WEST, N.Y. 1968 (INSP. 1976)

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**JOHNSON CITY
GROUNDWATER ELEVATIONS - DEEP WELLS 12-18-92**

FIGURE 3-5

4.0 CONTAMINATION ASSESSMENT

4.1 Volatile Organic Compounds

Fourteen (14) groundwater monitoring wells were sampled during the additional investigation and samples analyzed for volatile organic compounds (VOCs) per EPA Method 524.2. Results of analyses are presented in Table 4-1. Compounds exceeding New York State Standards Criteria and Guidance (SCG) values are plotted on Figures 4-1 and 4-2. With the exception of MW-4D, one or more VOC was found in each of the wells sampled. Concentrations exceeding SCG values were found in only six (6) wells. Compounds detected above SCG values were limited to cis-1,2-Dichloroethene (DCE) at MW-2D (a dehalogenation product of trichloroethene) at 49 ppb and 1,1,1-Trichloroethane (TCA) at locations MW-3D (6.2 ppb), MW-5D (10.0 ppb), MW-7S (13.0 ppb), MW-9S (6.2 ppb), and MW-10S (28.0 ppb).

As presented on Figures 4-1 and 4-2, concentrations of TCA increase toward the northern limits of the investigation area at MW-10S. A concentration of DCE above the SCG value is found locally at MW-2D, northeast of the Camden Street wellfield.

4.2 Metals and Cyanide

Target Analyte List (TAL) metals in excess of SCG values were detected in all monitoring wells sampled during the additional investigation. Metals exceeding SCG values are plotted on Figures 4-1 and 4-2. Iron exceeded the SCG value in all wells sampled ranging from 654 ppb at location MW-1D to 919,000 ppb at location MW-9S. Manganese exceeded the SCG value at all but one location ranging from 392 ppb at MW-1D to 59,900 ppb at MW-10S. Additional metals found exceeding SCG values within the study area include: barium, beryllium, chromium, copper, lead, magnesium, sodium, and zinc. Results of metals analysis are presented on Table 4-2.

Based on the results of the initial sampling performed in 1991, metals analyses for the 1992 samples are believed to be exceedingly high. These elevated metals concentrations may be due to some combination of an increased contaminant load from upgradient sources, relatively

TABLE 4-1
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
METHOD 524.2 VOLATILES

WELL AND SAMPLE ID NUMB	SCG	JC-MW-IS	JC-MW-ID	JC-MW-2S	JC-MW-2D	JC-MW-3D	JC-MW-4S	JC-MW-4D
COLLECTION DATE	(ppb)	12/14/92	12/14/92	12/16/92	12/16/92	12/15/92	12/15/92	12/15/92
PARAMETER								
Dichlorodifluoromethane	5	ND	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	1.1	ND	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	0.4 J	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	ND	ND	ND	1.3	ND	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	5	ND	ND	ND	2.4 B	ND	ND	ND
Benzene	0.7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND

All results are reported in ug/L (ppb).

J - The sample results are less than the quantitation limit, but greater than zero.

ND - Not Detected

Shading - Concentration exceeds SCG value.

B - Compound also detected in method blank.

E - Estimated concentration exceeding the linear range of calibration.

TABLE 4-1
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
METHOD 524.2 VOLATILES

WELL AND SAMPLE ID NUMB COLLECTION DATE	SCG (ppb)	JC-MW-1S 12/14/92	JC-MW-ID 12/14/92	JC-MW-2S 12/16/92	JC-MW-2D 12/16/92	JC-MW-3D 12/15/92	JC-MW-4S 12/15/92	JC-MW-4D 12/15/92
PARAMETER								
Dibromochloromethane	50	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
meta and/or para-Xylene	5	ND	ND	ND	ND	ND	ND	ND
ortho-Xylene	5	ND	ND	ND	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND	ND	ND	ND
Bromoform	50	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	5	ND	ND	ND	ND	ND	ND	ND
Propylbenzene	5	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	5	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	4.7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	4.7	ND	ND	ND	ND	ND	ND	ND
Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	5	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5	ND	ND	ND	0.84 J	ND	ND	ND
Acetone	50	9.2 B	3.5 JB	6.8	1.1	1.2 JB	19 B	ND
2-Butanone	50	ND	ND	ND	1.3 J	ND	ND	ND

All results are reported in ug/L (ppb).

J - The sample results are less than the quantitation limit, but greater than zero.

ND - Not Detected

B - Compound also detected in method blank.

TABLE 4-1 (Cont'd.)
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
METHOD 524.2 VOLATILES

WELL AND SAMPLE ID NUMB	SCG	JC-MW-5S	JC-MW-5D	JC-MW-6D	JC-MW-7S	JC-MW-8I	JC-MW-9S	JC-MW-10S
COLLECTION DATE	(ppb)	12/16/92	12/16/92	12/15/92	12/15/92	12/17/92	12/17/92	12/17/92
PARAMETER								
Dichlorodifluoromethane	5	ND	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	0.3 J
trans-1,2-Dichloroethene	5	0.2 J	0.7 J	ND	0.7 J	0.3 J	0.3 J	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	2
2,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	ND	ND	ND	ND	0.9 J	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	4.3 B	10 B	ND	13	2.6 B	6.2 B	28 BE
1,1-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	5	ND	ND	ND	ND	ND	ND	ND
Benzene	0.7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	0.6 J	1	ND	2.1	1.7	0.8 J	0.2 J
1,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	50	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND

All results are reported in ug/L (ppb).

J - The sample results are less than the
quantitation limit, but greater than zero.

ND - Not Detected

Shading - Concentration exceeds SCG value.

B - Compound also detected in method blank.

E - Estimated concentration exceeding the linear range of calibration.

TABLE 4-1 (Cont'd.)
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
METHOD 524.2 VOLATILES

WELL AND SAMPLE ID NUMB	SCG	JC-MW-5S	JC-MW-5D	JC-MW-6D	JC-MW-7S	JC-MW-8I	JC-MW-9S	JC-MW-10S
COLLECTION DATE	(ppb)	12/16/92	12/16/92	12/15/92	12/15/92	12/17/92	12/17/92	12/17/92
PARAMETER								
Dibromochloromethane	50	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
meta and/or para-Xylene	5	ND	ND	ND	ND	ND	ND	ND
ortho-Xylene	5	ND	ND	ND	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND	ND	ND	ND
Bromoform	50	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	5	ND	ND	ND	ND	ND	ND	ND
Propylbenzene	5	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	5	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	4.7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	4.7	ND	ND	ND	ND	ND	ND	ND
Butylbenzene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	5	ND	ND	ND	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
Acetone	50	2 J	5.3 B	6.3 B	0.4 J	0.5 J	ND	ND
2-Butanone	50	ND	ND	ND	ND	ND	ND	ND

All results are reported in ug/L (ppb).

J - The sample results are less than the quantitation limit, but greater than zero.

ND - Not Detected

Shading - Concentration exceeds SCG value.

B - Compound also detected in method blank.

A-4757

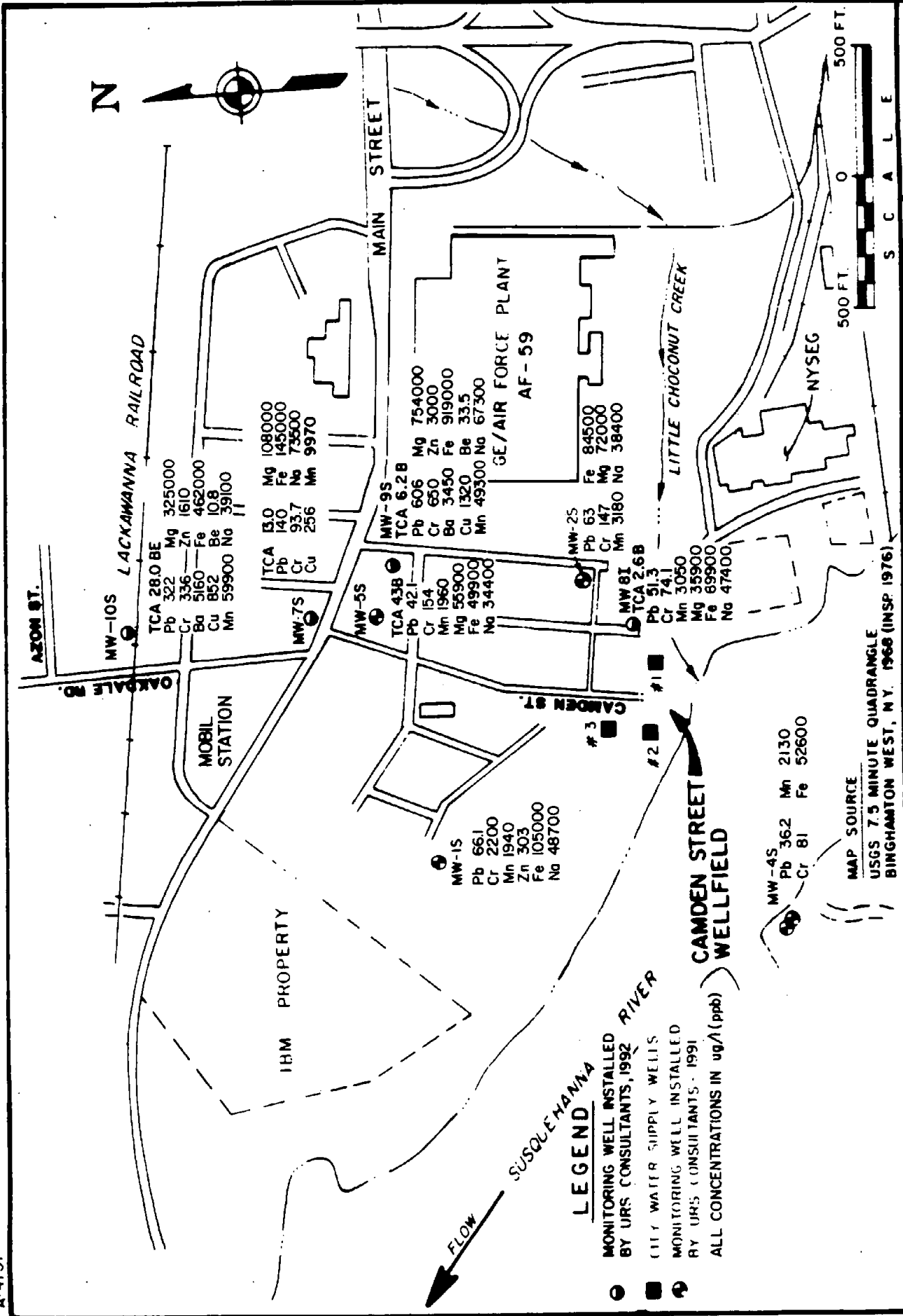


FIGURE 4-1

JOHNSON CITY
CONTAMINANTS EXCEEDING CURRENT GA STANDARDS - SHALLOW WELLS



A-4756

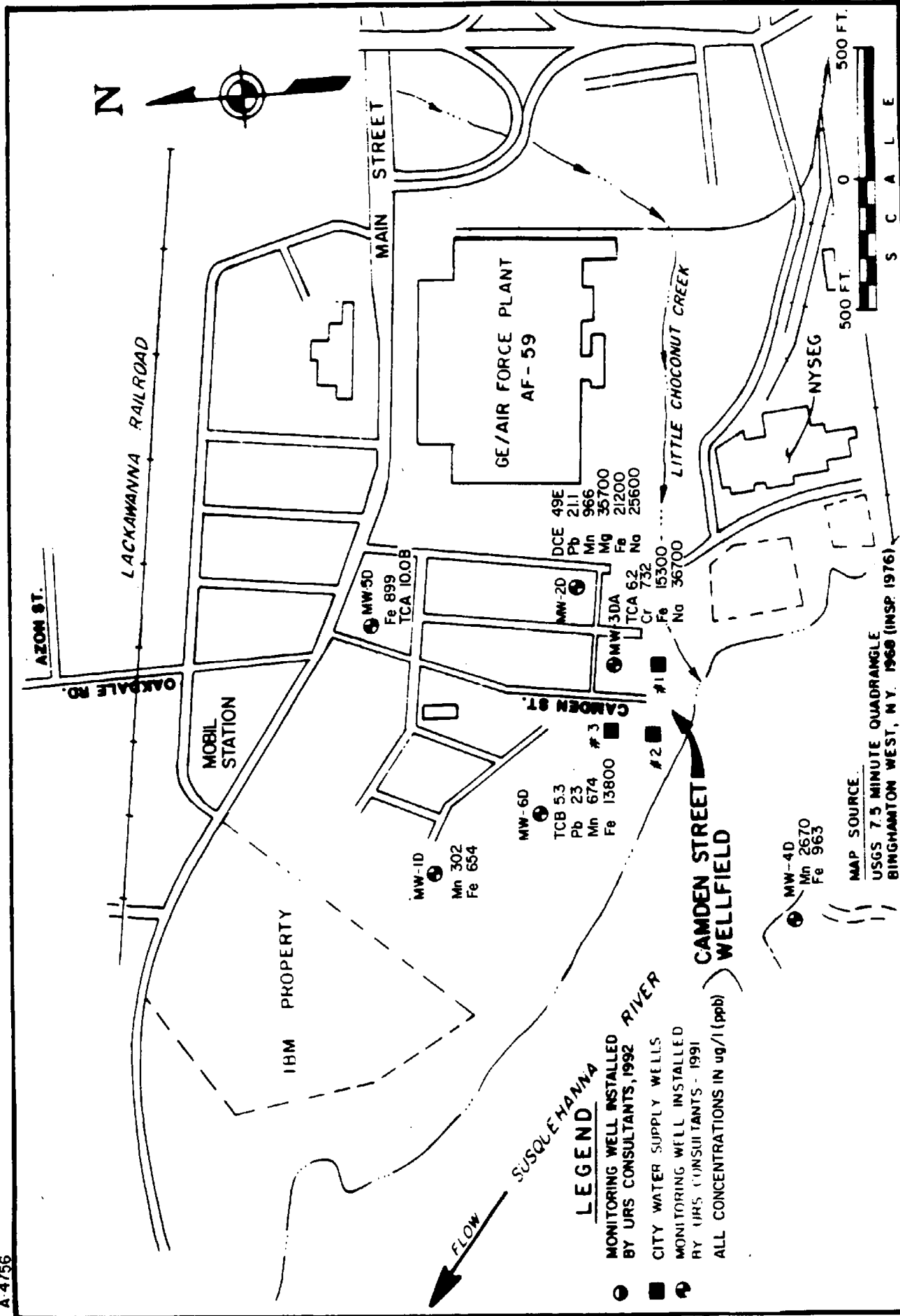


TABLE 4-2
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
TAL METALS, CYANIDE

WELL AND SAMPLE ID NUMBER	SCG	JC-MW-1S	JC-MW-1D	JC-MW-2S	JC-MW-2D	JC-MW-3D	JC-MW-4S	JC-MW-4D
COLLECTION DATE	(ppb)	12/14/92	12/14/92	12/16/92	12/16/92	12/15/92	12/15/92	12/15/92
PARAMETER								
	TYPE							
Aluminum	MET	48100	318	40300	10600	96.2 B	20500	401
Antimony	MET			19.1 BN				
Arsenic	MET	11.7 N		28.8 NS	7.7 BNW	10.4 N	17.9 BNS	
Barium	MET	365	18 B	610	167 B	130 B	238	37.6 B
Beryllium	MET	1.5 B		1.9 B			1.2 B	
Cadmium	MET	2 B		2.8 B	3.3 B	2 B		2.1 B
Calcium	MET	36400	40700	256000	144000	125000	37700	24100
Chromium	MET	2200	20.2	147	31.4	732	81	9.6 B
Cobalt	MET	49.2 B	4 B	37.1 B	7.3 B	5.2 B	17.9 B	
Copper	MET	146	15 B	138	25.1	23.8 B	112	5.5 B
Iron	MET	105000	654	84500	21200	15300	52600	963
Lead	MET	66.1		63	21.1	3.1	36.2	
Magnesium	MET	20100	6510	72000	35700	22800	9670	2960 B
Manganese	MET	1940	302	3180	966	63.7	2130	2670
Mercury	MET			0.42		0.22		
Nickel	MET	275	21.8 B	235	31.6 B	117	81	
Potassium	MET	4810 B	1450 B	9250	3950 B	2530 B	2870 B	1810 B
Selenium	MET			3.1 BNW				
Silver	MET							
Sodium	MET	48700	10900	38400	25600	36700	7490	8270
Thallium	MET							
Vanadium	MET	66.8 E		58.7 E	19.5 BE	14.4 BE	23.2 BE	
Zinc	MET	303	26.1	257	81.6	40.5	157	18.8 B
Cyanide	CN							

B - Result is less than contract required detection limit, but greater than instrument detection limit.
N - Spiked sample recovery not within control limits.
E - Reported value is estimated because of interference.
S - Reported value is determined by the method of standard additions.

All results reported in µg/kg (ppb).

* - Standard for total of iron and manganese is 500.

- New NYSDOH action level for lead is 15 ppb.

TABLE 4-2 (Cont'd.)
JOHNSON CITY WATER SUPPLY
GROUNDWATER MONITORING WELLS
TAL METALS, CYANIDE

WELL AND SAMPLE ID NUMBER	SCG	JC-MW-5S	JC-MW-5D	JC-MW-6D	JC-MW-7S	JC-MW-8I	JC-MW-9S	JC-MW-10S
COLLECTION DATE	(ppb)	12/16/92	12/16/92	12/15/92	12/15/92	12/17/92	12/17/92	12/17/92
PARAMETER	TYPE							
Aluminum	MET	19900	241	6400	50400	31300	444000	213000
Antimony	MET							
Arsenic	MET	13.4 N		4 BN	26.6 NS	12.5 BNS	11.2 N	42.1 NS
Barium	MET	230	96.6 B	135 B	735	400	3450	5160
Beryllium	MET				4.3 B	1.7 B	33.5	10.8
Cadmium	MET		2.4 B		3.7 B	3.2 B		2.5 B
Calcium	MET	177000	110000	38200	414000	167000	2130000	829000
Chromium	MET	154	32.3	17	93.7	74.1	650	336
Cobalt	MET	27.7 B		8.2 B	61.9	28.1 B	407	200
Copper	MET	109	6.2 B	29.4	256	85.6	1320	852
Iron	MET	49900	899	13800	145000	69900	919000	462000
Lead	MET	42.1	2.4 B	23	140	51.3	606	322
Magnesium	MET	55900	20100	8600	109800	35900	754000	325000
Manganese	MET	1960	20.4	674	9970	3050	49300	59900
Mercury	MET				0.26		0.98	1.1
Nickel	MET	166	24 B	18.4 B	135	69.8	893	523
Potassium	MET	6430	2710 B	2280 B	10200	7710	33200	19200
Selenium	MET		2.3 BNW					
Silver	MET							
Sodium	MET	34400	37300	9970	73500	47400	67300	39100
Thallium	MET							
Vanadium	MET	39.3 BE		11.8 BE	101 E	46.4 BE	571 E	309 E
Zinc	MET	182	27.8	57.3	509	224	3000	1610
Cyanide	CN							

B - Result is less than contract required detection limit, but greater than instrument detection limit.
N - Spiked sample recovery not within control limits.
E - Reported value is estimated because of interference.
S - Reported value is determined by the method of standard additions.
W - Spike recovery analysis out of control limits.

All results reported in µg/kg (ppb).

* - Standard for total of iron and manganese is 500.

- New NYSDOH action level for lead is 15 ppb.

high levels of turbidity, and/or other changes in natural aquifer chemistry. Turbidity measurements during sampling are presented in the purging logs presented in Appendix C.

5.0 CONCLUSIONS

Results of the additional subsurface investigation near the Johnson City, Camden Street Wellfield have provided additional information about the sources of chemical contamination affecting the wellfield. Water table sampling and subsequent monitoring well sampling and analysis has supported the contention that the source of the organic contaminants, notably TCA with trace amounts of trichloroethene is north of the wellfield. Locally high levels of benzene, ethylbenzene, toluene, xylene, and possibly TCA have been found in a water table sample collected at the former Day and Nite Food Store on Main Street. Relatively widespread double digit part per billion TCA concentrations were found in 17 water table samples at the 100 Oakdale Road site. The concentrations and areal distribution of TCA adversely impacting groundwater quality at MW-3D, MW-5D, MW-7S, MW-9S and MW-10S also conforms to indicate sources for these contaminants near or upgradient of the locations noted above.

The source of the DCE at MW-2D and other chlorinated ethenes of lower concentration in proximity, is probably upgradient of the well. A potential source of this chemical could be Air Force Plant 59, as its effluent has been known to historically contain trichloroethene (TCE). However, it is not known if current hydrogeologic conditions allow unrestricted migration from AF-59 to the wellfield. It is also possible that the DCE originated from other upgradient commercial sources which could commonly use TCE.

The results of the metals analyses appear to be inconclusive as the reasons for the elevated levels of these naturally occurring elements are not exclusive.

6.0 RECOMMENDATIONS

Based on results of the contaminant source investigation to date, contaminants found in the Johnson City Wellfield appear to have migrated from two directions. However, further investigation will be required to identify the source or sources of contamination.

Generally, further investigation would proceed in a more or less phased approach. We recommend that the investigation proceed with additional reconnaissance of Johnson City over an area of approximately 1.2 square miles immediately north of the area previously investigated. We suggest that this reconnaissance include a review of existing NYSDEC files which may be available at the Kirkwood Office (particularly any hazardous waste/substance data bases or registries), a review of aerial photographs which may be available from local sources, and a review of Sanborn Fire Insurance Maps which may be locally available. The information gleaned from these sources should be field checked and/or supplemented by a "windshield" survey of the area of investigation. The data and information gathered in this effort should be integrated with the most recently available groundwater flow path information which can be provided by the U.S. Geological Survey's Albany office regional modeling efforts. The reconnaissance effort would provide information necessary to selectively guide future prioritized Geoprobe sampling and field analysis.

As found during the additional investigation, Geoprobe sampling with field analysis for TCA proved effective for locating contamination and justified selection of monitoring well locations. Further investigation should, therefore, also utilize Geoprobe sampling and field analysis for selection of additional monitoring well locations.

APPENDIX A

**MONITORING WELL LOGS AND
CONSTRUCTION DIAGRAMS**

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. **MW-75**

PROJECT: **JOHNSON CITY WELL FIELD**

SHEET NO. **1 OF 1**

CLIENT: **NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION**

JOB NO.: **0535238.00**

BORING CONTRACTOR: **TECHNICAL DRILLING SERVICES**

BORING LOCATION: **DAY & NIGHT STORE PARKING LOT**

GROUND WATER:

CAS. SAMP CORE TUBE

GROUND ELEVATION:

DATE	TIME	LEV	TYPE	TYPE	SPLIT SPIN (SS)
11-25	3:15p	23.20	T. RISER	DIA.	2"
11-25	4:30p	23.15	T. RISER	WT.	140 lb.
				FALL	30"

DATE STARTED: **11-17-92**

DATE FINISHED: **11-18-92**

DRILLER: **MARTIN FUHRMANN**

GEOLOGIST: **SCOTT SWANSON**

* POCKET PENETROMETER READING

REVIEWED BY: **DUAJE LEHARIST**

DEPTH FT	STRATA	SAMPLE				RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 5"							
5		1	SS	8 24	17 12	45%	LT. BROWN	DENSE	Silty Sandy coarse GRAVEL	GM	1-1 1/2" DIAM. MOIST WELL ROUNDED GRAVEL
10		2	SS	5 5	5 4	90%	DK BROWN	LOOSE	Silty Fine SAND	SM	MOIST
15		3	SS	8 5	9 4	100%	LT BROWN DK BROWN	MEDIUM DENSE			2 MOIST
20		4	SS	6 7	6 7	80%	BROWN BROWN SOME RED		Silty-Sandy GRAVELS	GM	4"-1" WELL ROUNDED GRAVEL
25		5	SS	4 3	1 4	25%	MULTI-COLOR GRAVELS GRAYS, BROWNS, BLACK, YELLOW	V. LOOSE			WET
30		6	SS	1 2	1 1	40%	BROWN		Fine SAND Gravelly fine SAND	SP	
35		7	SS	2 4	3 5	50%	DK BROWN	LOOSE	F-M SAND Sandy GRAVELS	GP	

COMMENTS

TOTAL DEPTH **37 FT.**

DRILL RIG: **MOBILE B-52 TRUCK MOUNT USING 4 1/4" I.D. HSA**

SCREEN @ **20-35'**

CUTTINGS SCREENED WITH #40 (PFD) - NO READINGS ABOVE

PROJECT NO.

0535238.00

BACKGROUND DETECTED

BORING NO.

MW-75

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. **MW-8 I**

PROJECT: **JOHNSON CITY WELLFIELD**

SHEET NO. **1 OF 2**

CLIENT: **NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION**

JOB NO.: **0535238.00**

BORING CONTRACTOR: **TECHNICAL DRILLING SERVICES**

BORING LOCATION: **S. END OF BERWIN ST.**

GROUND WATER:

CAS. SAMP CORE TUBE

GROUND ELEVATION:

DATE	TIME	LEV	TYPE	TYPE	SPLIT SPAWN (SS)
11-23	10:30A	27.9	Below Ground	DIA.	2"
11-25	8:05A	30.85	T. of Riser	WT.	140 lb.
				FALL	30"

DATE STARTED: **11-18-92**

DATE FINISHED: **11-23-92**

DRILLER: **MARTIN FUHRMANN**

GEOLOGIST: **SCOTT SWANSON**

* MEASURED INSIDE AUGERS AFTER * POCKET PENETROMETER READING

REVIEWED BY: **DUANE LEHARST**

DEPTH FT	STRATA	SAMPLE 2 DAY				STABILIZATION RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 6"	RECOVERY							
5	[Hand-drawn soil profile with circles and dots]	1	SS	7 6	3 17	50%	RED-Brown	LOOSE	Sandy GRAVEL TO Gravelly SAND	GW	14N11 BG = Background BG CUTTINGS 1-3" DIA. GRAVELS WELL ROUNDED V. MOIST DRY DRY/ SL. MOIST WET MOIST V. MOIST WET	
10		2	SS	18 31	26 35	60%	Brown Sand GREEN-GRAY SILT GRAY & RED GRAVEL V. DENSE	DENSE	Silty Sandy GRAVEL	GM		
15		3	SS	28	50/5"	100%						
20		4	SS	50/4"		100%						
25									COBBLE OR BOULDER			
30		5	SS	10 25	12 47	65%	DARK BROWN BANKATE DL GRAY	DENSE	F-M SAND, some Gravel	SP		
35		6	SS	16 12	14 6	50%	BROWN RED GRAY	MEDIUM DENSE	Silty Sandy Gravel	GM		
	7	SS	20 11	17 7	50%	BROWN- GRAY						

4-3205

COMMENTS **DRILL RIG: TRUCK MOUNTED MOBILE B-52 USING 4 1/4" I.D HSA**
SCREEN @ 34.5-59.5 FT.

PROJECT NO. **0535238.00**
BORING NO. **MW-8 I**

PROJECT: JOHNSON CITY WELLFIELD

CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION

DEPTH FT	STRATA	SAMPLE				RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU REMARKS BG = (BACKGROUND)	
		NO.	TYPE	BLOWS PER 6"								
37												
40		8	SS	25 18	15 40	65%	GRY GRAY	MEDIUM DENSE DENSE	Silty Sandy GRAVEL some weathered shales	GM BG1	WET	
45		9	SS	38 18	12 16	40%	DK GRAY/ Brown		Gravelly F-C SAND	SW BG1 1/4"-1" well rounded GRAVEL		
50		10	SS	25 18	22 12	75%	DK BRN		Coarse Sandy GRAVEL coarse SAND some fine gravel	GP SP	BG1 1/2"-1 1/2" GRAVEL	
55		11	SS	38 50	50	100%	GRAY- GREEN/ BRN.	V. DENSE TO HARD	Sandy CLAY some silt and fine gravel	SC	BG1	
60		12	SS	25 60	38 50	100%	BROWN/ GRAY				BG1	MOIST-DRY
									TOTAL DEPTH 62'			

COMMENTS

PROJECT NO.
BORING NO.

0535238.00
MW-8I

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. MW-95

PROJECT: JOHNSON CITY WELLFIELD

SHEET NO. 1 OF 1

CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION

JOB NO.: 0535238.00

BORING CONTRACTOR: TECHNICAL DRILLING SERVICES

BORING LOCATION: YARD ON DAYTON ST. BEHIND SWANCO STATION

GROUND WATER:

CAS. SAMP CORE TUBE

GROUND ELEVATION:

DATE	TIME	LEV	TYPE	TYPE	SPLIT SPOON (SS)
11-24	9:00A	23.1	Below Ground	DIA.	2"
11-25	1:30P	22.55	T. RISER	WT.	140 lb.
11-25	3:00P	22.50	T. RISER	FALL	30"

DATE STARTED: 11-24-92

DATE FINISHED: 11-24-92

DRILLER: MARTIN FUHRMANN

GEOLOGIST: SCOTT SWANSON

* MEASURED INSIDE ANGERS AFTER * POCKET PENETROMETER READING

REVIEWED BY: DUANE LEJHAARDT

DEPTH FT	STRATA	SAMPLE OVERNIGHT STABILIZATION				COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS	
		NO.	TYPE	BLOWS PER 6"	RECOVERY ROD %						
5	SS	1	SS	6 4	4 5	50%	LT. BRN. SOME YEL-BRN.	LOOSE	SILT, some gravel	ML Bg Background	MOIST
10	SS	2	SS	6 10	7 10	50%	RED BROWN GRAY	MEDIUM DENSE	Sandy GRAVEL	GW Bg 1/4"-1"	SL. MOIST TO DRY
15	SS	3	SS	15 8	10 7	50%				Bg 1/2"-1"	MOIST V. MOIST
20	SS	4	SS	8 6	8 13	50%	YELLOW BROWN		Silty Sandy GRAVEL	GM Bg 1/4"-1" Sub rounded	wet V. MOIST
25	SS	5	SS	9 10	7 7	35%				Bg	WET
30	SS	6	SS	14 10	13 12	80%	LT. YEL BROWN GRAY	STIFF	SILT clayey SILT	ML ML/CL Bg slightly plastic	
35		7	SS	7 5	6 6	100%					
								TOTAL DEPTH 34'			

COMMENTS DRILL RIG: MOBILE B-52 TRUCK MOUNTED, USING 4 1/4" I.D. HSA SCREEN @ 20-30 FT.

PROJECT NO. 0535238.00
BORING NO. MW-95

A-3205

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO.

MW-10S

PROJECT: JOHNSON CITY WELLFIELD

SHEET NO. 1 OF 1

CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION

JOB NO.: 0535238.00

BORING CONTRACTOR: TECHNICAL DRILLING SERVICES

BORING LOCATION: NEXT TO 100 OAKDALE

GROUND WATER:

CAS. SAMP CORE TUBE

GROUND ELEVATION:

DATE	TIME	LEV	TYPE	TYPE	SPLIT SPOON (SS)
11-25	8:40a	18.5	Below Ground	DIA.	2"
11-25	4:40p	17.05	T. RISER	WT.	140 lb.
11-25	5:30p	17.05	T. RISER	FALL	30"

DATE STARTED: 11-24-92

DATE FINISHED: 11-25-92

DRILLER: MARTIN FUHRMANN

GEOLOGIST: SCOTT SWANSON

REVIEWED BY: DUANE LENHARDT

MEASURED INSIDE ALLEYS AFTER OVER * POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE			RECOVERY	COLOR	CONSISTENCY	DESCRIPTION	CLASS USCS	REMARKS
		NO.	TYPE	BLOWS PER 6"						
5	SS	1	SS	3/5	85%	DK. GRAY/BLACK LT. YEL. BROWN	LOOSE	SILT TRACE - SOME V. FINE SAND	ML SM	BG V. MOIST
10	SS	2	SS	4/10	60%		MEDIUM DENSE			BG 1/4" GRAVEL IN BOTTOM OF SPIN
15	SS	3	SS	4/6	40%		LOOSE	Silty Sandy GRAVEL	GM	BG 1/4-1/2" WELL ROUNDED GRAVEL
20	SS	4	SS	5/7	65%	LT. BROWN DK. BROWN	MEDIUM DENSE	Fine-Medium SAND	SP	BG WET
25	SS	5	SS	11/16	100%	DK BRN GRAY LT. RED-BROWN		Becoming fine-coarse Sandy GRAVEL TR. CLAY	GW	BG 1/4-1/2" gravel
30	SS	6	SS	11/11	100%	DK. BROWN				BG
35	SS	7	SS	10/16	100%			Fine-Med. SAND Gravelly F-M SAND	SP	BG 1-1/2" gravel

COMMENTS

TOTAL DEPTH 37 FT.

DRILL RIG: TRUCK MOUNTED MOBILE B-52 USING 4 1/4" I.D. HSA SCREEN @ 14.5-34.5 FT.

PROJECT NO.

0535238.00

BORING NO.

MW-10S

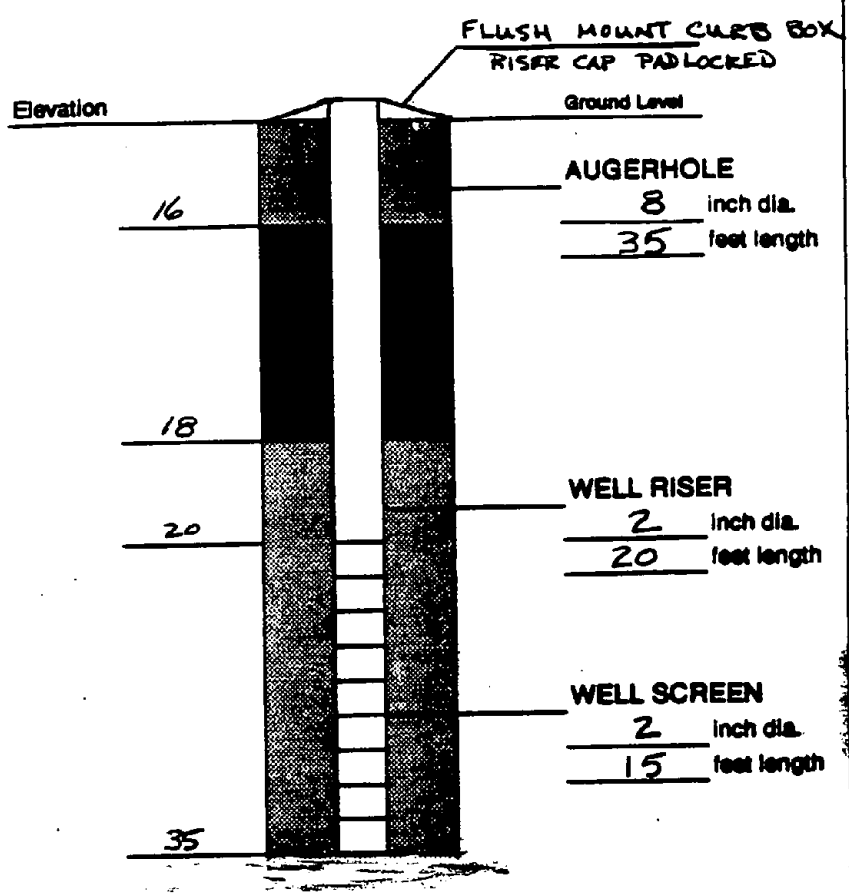
DRILLING SUMMARY

Geologist:
SCOTT SWANSON
Drilling Company:
TECHNICAL DRILLING
Driller:
MARTIN FUHRMANN
Date:
11-18-92

GEOLOGIC LOG

depth(ft.)	lithology
0-10	Silty Sandy GRAVEL
10-21	Silty Fine SAND
21-30	Silty Sandy GRAVEL
30-31	Fine SAND
31-35	Gravelly Fine SAND
35-36	F-M SAND
36-37	Sandy GRAVEL

D
E
P
T
H



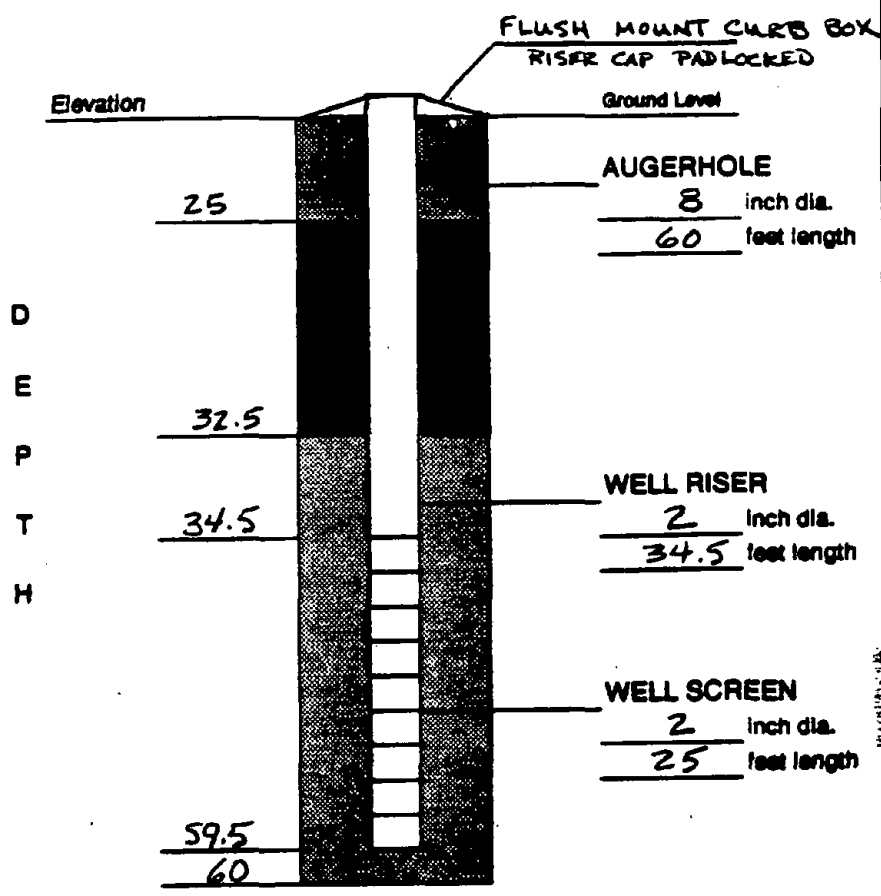
WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	SEAL MATERIAL
Surface: QUIK-CRETE CONCRETE MIX SURFACE FLASH CASING Monitor: PVC	Type: PVC Slot Size: 10 SLOT	Seal #1 Type: BENTONITE PELLETS Setting: 16-18 FT. Seal #2 Type: PORTLAND CEMENT AND GRAVEL CUTTINGS Setting: 0-16
FILTER MATERIAL	ROCK CORING	LEGEND
Type: 40-ROK SILICA SAND Setting: 18-35'	Cored Interval: Core Diameter: Reamed Diameter:	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: black; margin-right: 5px;"></div> Cement/Bentonite Grout </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: black; margin-right: 5px;"></div> Bentonite Seal </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); margin-right: 5px;"></div> Silica Sandpack </div>
Client: NYSDEC	Project: JOHNSON CITY WELLFIELD	Project Number: 0535238.00
URS Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-75

DRILLING SUMMARY
 Geologist:
 SCOTT SWANSON
 Drilling Company:
 TECHNICAL DRILLING
 Driller:
 MARTIN FUHRMANN
 Date:
 11-23-92

GEOLOGIC LOG

depth(ft.)	lithology
0-10	Sandy GRAVEL/ Gravelly SAND
10-22	Silty Sandy GRAVEL
22-25	COBBLE, BOULDER
25-27	F-M SAND
27-45	Silty Sandy GRAVEL
45-50	Gravelly F-C SAND
50-51.5	Cs. Sandy GRAVEL
51.5-56.5	Cs. SAND
56.5-62	Cs. SANDY SILT CLAY



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	SEAL MATERIAL
Surface: QUIK-CRETE CONCRETE MIX SURFACE FLUSH CASING Monitor: PVC	Type: PVC Slot Size: 10 SLOT	Seal #1 Type: BENTONITE PELLETS AND CUTTINGS Setting: 25-32.5 Seal #2 Type: PORTLAND CEMENT AND GRAVEL CUTTINGS Setting: 0-25'
FILTER MATERIAL Type: 4 Q-ROK SILICA SAND Setting: 32.5-60'	ROCK CORING Roller Bit Interval: 22-25' Cored Interval: Core Diameter: Roller Bit Diameter: 3 7/8" Reamed Diameter: 8" AUGER AFTER DRILLING OUT BOULDER 22-25'	LEGEND <ul style="list-style-type: none"> Cement/Bentonite Grout Bentonite Seal Silica Sandpack
Client: NYSDEC	Project: JOHNSON CITY WELLS	Project Number: 0535238.00
URS Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-8I

DRILLING SUMMARY

Geologist:
SCOTT SWANSON

Drilling Company:
TECHNICAL DRILLING

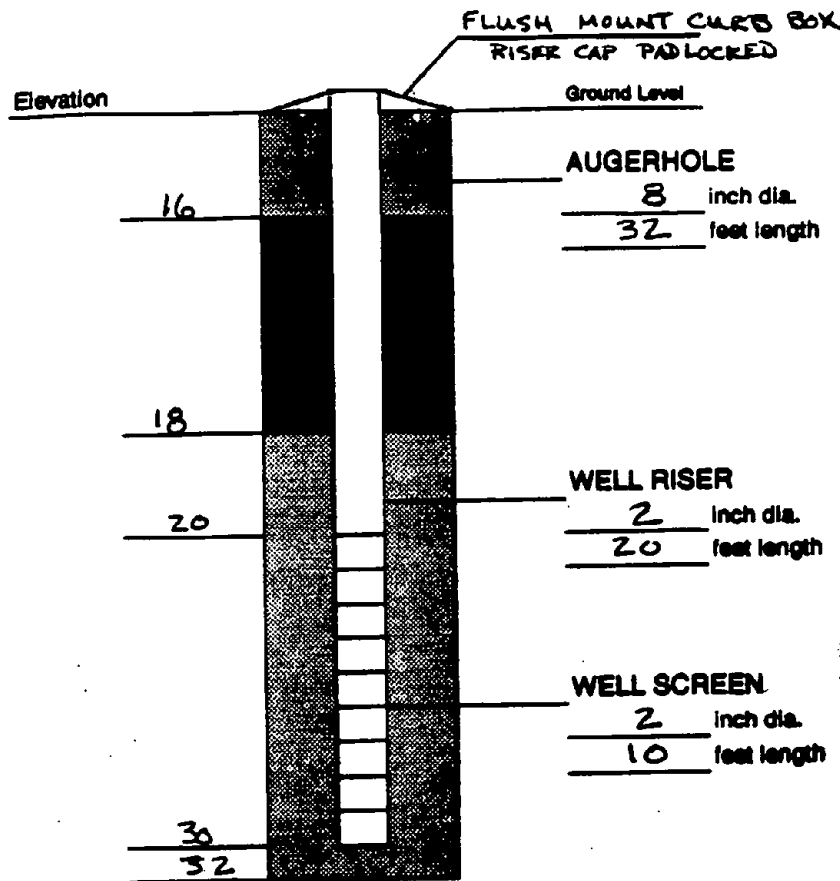
Driller:
MARTIN FUHRMANN

Date:
11-24-92

GEOLOGIC LOG

depth(ft.)	lithology
0-10	SILT, some grave
10-20	Sandy GRAVEL
20-30.5	Silty Sandy GRAVEL
30.5-31.5	SILT
31.5-34	Clayey or SILT silty CLAY

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	SEAL MATERIAL
Surface: QUIK-CRETE CONCRETE MIX SURFACE FLUSH CASING Monitor: PVC	Type: PVC Slot Size: 10 SLOT	Seal #1 Type: BENTONITE PELLETS Setting: 16-18 FT Seal #2 Type: PORTLAND CEMENT AND GRAVEL CUTTINGS Setting: 0-16
FILTER MATERIAL	ROCK CORING	LEGEND
Type: 4 Q-ROK SILICA SAND Setting: 18-32' FT	Cored Interval: Core Diameter: Reamed Diameter:	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: black; margin-right: 5px;"></div> Cement/Bentonite Grout </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: gray; margin-right: 5px;"></div> Bentonite Seal </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-image: radial-gradient(circle, black 1px, transparent 1px); background-size: 4px 4px; margin-right: 5px;"></div> Silica Sandpack </div>
Client: NYSDEC	Project: JOHNSON CITY WELLFIELD	Project Number: 0535238.00
URS Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-95


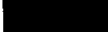

DRILLING SUMMARY

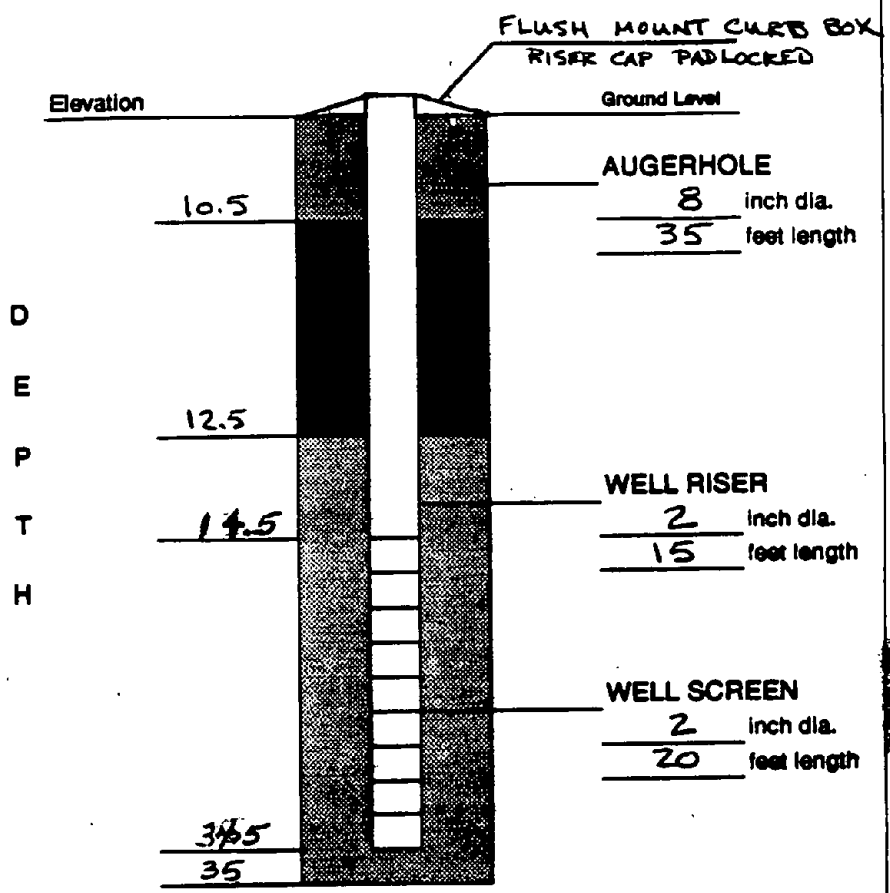
Geologist:
SCOTT SWANSON
Drilling Company:
TECHNICAL DRILLING
Driller:
MARTIN FUHRMANN
Date:
11-25-92

GEOLOGIC LOG

depth(ft.)	lithology
0-15	SILT Tr. v.f. sand
15-21	Silty Sandy GRAVEL
21-25.5	F-M SAND
25.5-35	Sandy GRAVEL
35-36	F-M SAND
36-37	Gravelly F-M SAND

WELL DESIGN

<p>CASING MATERIAL</p> <p>Surface: QUIK-CRETE CONCRETE MIX SURFACE FLUSH CASING Monitor: PVC</p>	<p>SCREEN MATERIAL</p> <p>Type: PVC Slot Size: 10 SLOT</p>	<p>SEAL MATERIAL</p> <p>Seal #1 Type: BENTONITE PELLETS Setting: 10.5 - 12.5 FT. Seal #2 Type: PORTLAND CEMENT AND GRAVEL CUTTINGS Setting: 0 - 10.5 FT.</p>
<p>FILTER MATERIAL</p> <p>Type: 40-ROK SILICA SAND Setting: 12.5 - 35 FT</p>	<p>ROCK CORING</p> <p>Cored Interval: Core Diameter: Reamed Diameter:</p>	<p>LEGEND</p> <p> Cement/Bentonite Grout</p> <p> Bentonite Seal</p> <p> Silica Sandpack</p>
<p>Client: NYSDEC</p>	<p>Project: JOHNSON CITY WELLFIELD</p>	<p>Project Number: 0535238.00</p>
<p>URS Consultants Inc.</p>	<p>Monitoring Well Construction Details</p>	<p>Well Number: MW-103</p>



APPENDIX B

WELL DEVELOPMENT LOGS

PROJECT TITLE: Johnson City
 PROJECT NO.: 35328
 STAFF: J. CARUSO
 DATE: 12-2-92 → 12-4-92

WELL NO.: MW-75	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>35</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>23</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>2,04</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{1,958} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	33	53	93	113	133	160	180	200	233	253
pH											
Spec. Cond. (µmho)											
Turbidity (NTU)	>200	7200	7200	7200	150	128	104	96	94	>200	190
Temperature (°C)											
DATE	12-2	12-2	12-2	12-2	12-2	12-2	12-2	12-2	12-2	12-2	12-2

COMMENTS:

URS <small>CONSULTANTS, INC.</small>	WELL DEVELOPMENT/PURGING LOG
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PROJECT TITLE: Johnson City
 PROJECT NO.: 35328
 STAFF: J. Caruso
 DATE: 12-1-92 → 12-4-92

WELL NO.: MW-105	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>34.5</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
	3"	0.38
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>17.0</u>	4"	0.66
	5"	1.04
④ VOLUME OF WATER IN CASING (GAL.) <u>2.99 2.975</u>	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (1 - 3) = \underline{2.856}$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	333 8	348	363							
pH										
Spec. Cond. (µmho)										
Turbidity (NTU)	108	94	92							
Temperature (°C)										
DATE	12-4	12-4	12-4							

COMMENTS:

APPENDIX C

PURGE LOGS

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/14/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW 1D		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>91.20'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>14.74'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>12.99 gal</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (91.20 - 14.74) = 38.90$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	39								
pH	6.98	7.64								
Spec. Cond. (µmho)	270	325								
Turbidity (NTU)	7100	35								
Temperature (°C)	12.8	12.8								

COMMENTS: bailed 39 gallons

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/14/92

WELL NO.:		WELL I.D.	VOL. GAL./FT.
MW 1 S			
① TOTAL CASING AND SCREEN LENGTH (FT.):	<u>43.43'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.):	<u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.)	<u>13.44'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.)	<u>5.10 gal</u>	4"	0.66
		5"	1.04
		6"	1.50
		8"	2.60

$V = 0.0408 (2)^2 \times (43.43 - 13.44) = 15.30 \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	15.50								
pH	5.93	6.17								
Spec. Cond. (µmho)	490	468								
Turbidity (NTU)	>100	>100								
Temperature (°C)	12.8	12.8								

COMMENTS: bailed 15.5 gallons

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/16/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW 2D		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>90.30'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL, BELOW TOP OF CASING (FT.) <u>33.58</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>9.64</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{28.90} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	29								
pH	8.01	7.52								
Spec. Cond. (µmho)	2100	1110								
Turbidity (NTU)	47	7100								
Temperature (°C)	14.0	14.0								

COMMENTS: bailed 29 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00-12000
 STAFF: KK/RH
 DATE: 12/16/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW 25		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>60.20'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>33.78'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>4.49</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (60.20 - 33.78) = 13.47$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	14								
pH	7.33	7.33								
Spec. Cond. (µmho)	1156	1160								
Turbidity (NTU)	>100	>100								
Temperature (°C)	14.3	14.7								

COMMENTS: bailed 14 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/15/92

WELL NO.: MW-3D

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 97.46'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 38.84'
- ④ VOLUME OF WATER IN CASING (GAL.) 9.97gal

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (2)^2 \times (1) - (3) = \underline{29.90} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	30								
pH	7.48	7.46								
Spec. Cond. (umho)	875	1014								
Turbidity (NTU)	22	>100								
Temperature (°C)	12.2	12.2								

COMMENTS: bailed 30 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/15/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW 4 D		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>59.51'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>10.93'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>8.26</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\text{②})^2 \times (\text{①} - \text{③}) = \underline{24.78} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	25								
pH	6.57	7.02								
Spec. Cond. (µmno)	185	193								
Turbidity (NTU)	50	47								
Temperature (°C)	9.8	9.7								

COMMENTS: bailed 25 gallons

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/15/92

WELL NO.: <u>MW 45</u>	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>32.22'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>11.50'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>3.52 gal</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{10.56 \text{ gal}} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	11								
pH	6.04	6.13								
Spec. Cond. (µmho)	235	226								
Turbidity (NTU)	>100	>100								
Temperature (°C)	9.7	9.7								

COMMENTS: bailed 11 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/16/92

WELL NO.: MW 5D

- ① TOTAL CASING AND SCREEN LENGTH (FT.): 90.00'
- ② CASING INTERNAL DIAMETER (in.): 2"
- ③ WATER LEVEL BELOW TOP OF CASING (FT.) 24.66
- ④ VOLUME OF WATER IN CASING (GAL.) 11.10

WELL I.D.	VOL. GAL./FT.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{33.32}$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	34								
pH	11.35	7.43								
Spec. Cond. (µmho)	745	839								
Turbidity (NTU)	12	25								
Temperature (°C)	13.1	11.8								

COMMENTS: bailed 34 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238-00-12000
 STAFF: KK/RH
 DATE: 12/16/92

WELL NO.: MW 55	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>56.74'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
	3"	0.38
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>24.64'</u>	4"	0.66
	5"	1.04
④ VOLUME OF WATER IN CASING (GAL.) <u>5.45</u>	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (56.74 - 24.64) = 16.37$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	17								
pH	7.55	7.47								
Spec. Cond. (µmho)	873	829								
Turbidity (NTU)	>100	>100								
Temperature (°C)	13	13								

COMMENTS: bailed 17 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/15/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW-6D		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>95.90'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>16.20'</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>13.55 gal</u>	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (2)^2 \times (95.90 - 16.20) = 40.65 \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	41								
pH	7.65	8.10								
Spec. Cond. (µmho)	295	350								
Turbidity (NTU)	8	>100								
Temperature (°C)	12.2	12.2								

COMMENTS: bailed 41 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/15/92

WELL NO.:		WELL I.D.	VOL. GAL./FT.
MW-75			
① TOTAL CASING AND SCREEN LENGTH (FT.):	<u>34.92'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.):	<u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.)	<u>24.42'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.)	<u>1.79 gal</u>	4"	0.66
		5"	1.04
		6"	1.50
		8"	2.60

$$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{5.35} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	5.50								
pH	7.14	7.11								
Spec. Cond. (µmho)	1260	1359								
Turbidity (NTU)	>100	>100								
Temperature (°C)	12.4	12.4								

COMMENTS: bailed 5.50 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/17/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW - 8 I		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>59.30'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>33.64</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>4.36</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (1) - (3) = \underline{13.08}$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	13.50								
pH	8.07	7.30								
Spec. Cond. (µmho)	1132	1160								
Turbidity (NTU)	7100	7100								
Temperature (°C)	13.9	13.7								

COMMENTS: bailed 13.5 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238.00.12000
 STAFF: KK/RH
 DATE: 12/17/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW 95		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>30.00'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>24.04'</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.01</u>	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (1) - (3) = \underline{3.03} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	3.5								
PH	7.43	7.31								
Spec. Cond. (µmho)	1075	1088								
Turbidity (NTU)	7100	7100								
Temperature (°C)	13.5	13.8								

COMMENTS: bailed 3.5 gallons.

PROJECT TITLE: Johnson City
 PROJECT NO.: 35238-00-12000
 STAFF: KK/RH
 DATE: 12/17/92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW-105		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>34.00'</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2"</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>18.22'</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>2.68</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (\textcircled{2})^2 \times (\textcircled{1} - \textcircled{3}) = \underline{8.04} \text{ GAL. (3 casings)}$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	8.5								
pH	7.43	7.38								
Spec. Cond. (µmho)	943	946								
Turbidity (NTU)	>100	>100								
Temperature (°C)	12.0	11.7								

COMMENTS: bailed 8.5 gallons.

APPENDIX D

WELL SAMPLING FIELD SHEETS

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDDEC

Address: Kirkwood NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-1D

Sample Location: well in small park.

Date: 12/14/92 Crew: K.K. RH

Weather: partly sunny, 30°F

Purging Device: stainless steel bailer

Time Evacuated: 4:05 pm

Comments and Observations: DTW 19.62' at 4:35 pm

Collection

Date: 12/14/92 Crew: K.K. RH

Weather: partly sunny, 30°F

Time of Collection: 4:35 pm Sampling Device: Stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.64</u>	<u>325</u>	<u>12.8</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Identification: JC-MW-1D

Physical Observations: clear, turbidity 35 ntu

Laboratory: IEA Laboratories

Comments: _____

Reviewed by: _____ Date: 1/1
Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC
 Address: Kirkwood NY
 Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-15
 Sample Location: Well in small park
 Date: 12/14/92 Crew: K.K. R.H.
 Weather: partly sunny, 30°F
 Purging Device: stainless steel bailer
 Time Evacuated: 4:00 pm
 Comments and Observations: DTW 13.42' at 4:45 pm

Collection

Date: 12/14/92 Crew: K.K. R.H.
 Weather: partly sunny, 30°F
 Time of Collection: 4:45 pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>6.17</u>	<u>468</u>	<u>12.8</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-15

Physical Observations: cloudy brown, with silty particulates.
Turbidity > 100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1/
 Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC
 Address: Kirkwood, NY
 Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-2D
 Sample Location: _____
 Date: 12/16/92 Crew: K.K. R.H.
 Weather: overcast, light rain, 35°F
 Purging Device: stainless steel bailer
 Time Evacuated: 2:15 pm
 Comments and Observations: DTW 33.60' at 3:15 pm

Collection

Date: 12/16/92 Crew: K.K. R.H.
 Weather: overcast, 35°F
 Time of Collection: 3:15 pm Sampling Device: Stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.52</u>	<u>1110</u>	<u>14.0</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-2D

Physical Observations: cloudy, turbid gray turbidity 7100ntu

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1
 Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYS DEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-25

Sample Location: _____

Date: 12 116 192 Crew: K.K R.H

Weather: overcast, light rain, 35°F

Purging Device: stainless steel bailer

Time Evacuated: 1:15 pm

Comments and Observations: DTW 33.73' at 3:15pm

Collection

Date: 12 116 192 Crew: K.K R.H

Weather: overcast, light rain, 35°F

Time of Collection: 3:30 pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.33</u>	<u>1160</u>	<u>14.7</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-25

Physical Observations: cloudy brown, with silt particulates.
turbidity >100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1 1

Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC
 Address: Kirkwood, NY
 Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-3D
 Sample Location: well on corner of Elbow & Camden St.
 Date: 12/15/92 Crew: K.K R.H
 Weather: Sunny, 25°F
 Purging Device: stainless steel bailer
 Time Evacuated: 3:00 pm
 Comments and Observations: DTW 38.88' at 4:00 pm

Collection

Date: 12/15/92 Crew: K.K R.H
 Weather: Sunny, 25°F
 Time of Collection: 4:00 pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.68</u>	<u>960</u>	<u>12.2</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-3D

Physical Observations: cloudy brown, with silty particulates. turbidity 7100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: / /
 Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW 4D

Sample Location: well next to river.

Date: 12/15/92 Crew: K.K R.H

Weather: Sunny, 20°F

Purging Device: stainless steel bailer

Time Evacuated: 9:15 am

Comments and Observations: DTW 12.70' at 9:20 am

Collection

Date: 12/15/92 Crew: K.K R.H

Weather: Sunny, 20°F

Time of Collection: 9:20 am Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.02</u>	<u>193</u>	<u>9.7</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-4D

Physical Observations: clear, turbidity 47 NTU

Laboratory: IEA Laboratories.

Comments: _____

Reviewed by: _____ Date: / /
Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-45

Sample Location: well next to river

Date: 12/15/92 Crew: K.K. R.H.

Weather: Sunny, 20°F

Purging Device: stainless steel bailer

Time Evacuated: 9:30 am

Comments and Observations: DTW 11.58' at 9:40am

Collection

Date: 12/15/92 Crew: K.K. R.H.

Weather: Sunny, 20°F

Time of Collection: 9:40am Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>6.13</u>	<u>226</u>	<u>9.7</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-45

Physical Observations: cloudy brown, with silty particulates.
turbidity > 100 ntu.

Laboratory: FEA

Comments: _____

Reviewed by: _____ Date: / /
Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC
 Address: Kirkwood, NY
 Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-5 D
 Sample Location: _____
 Date: 12/16/92 Crew: K.K. R.H.
 Weather: overcast, light rain, 35°F
 Purging Device: stainless steel bailer
 Time Evacuated: 10:55 am
 Comments and Observations: DTW 24.72' at 2:30pm

Collection

Date: 12/16/92 Crew: K.K. R.H.
 Weather: overcast, light rain, 35°F
 Time of Collection: 2:40pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.41</u>	<u>922</u>	<u>12.0</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-5 D

Physical Observations: clear, turbidity 17 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1
 Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-55

Sample Location: _____

Date: 12/16/92 Crew: K.K. R.H.

Weather: overcast, light drizzle, 35°F

Purging Device: stainless steel bailer

Time Evacuated: 10:45 am

Comments and Observations: DTW 24.72' at 2:25 pm

Collection

Date: 12/16/92 Crew: K.K. R.H.

Weather: overcast, light rain, 35°F

Time of Collection: 2:25 pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.47</u>	<u>829</u>	<u>13.0</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-55

Physical Observations: cloudy brown, with silt particulates.
turbidity > 100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1/
Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-6D

Sample Location: well on the edge of park

Date: 12/15/92 Crew: Kevin Kearney Rick Helmich

Weather: Sunny, 25°F

Purging Device: stainless steel bailer

Time Evacuated: 12:20pm

Comments and Observations: DTW 16.28' at 2:40pm

Collection

Date: 12/15/92 Crew: K.K R.H

Weather: Sunny, 25°F

Time of Collection: 2:40pm Sampling Device: Stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>8.10</u>	<u>350</u>	<u>12.2</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-6D

Physical Observations: light tan. turbidity > 100 ntu

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1

Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYS DEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-75

Sample Location: Well on SE corner of Day & Night food store

Date: 12/15/92 Crew: K.K. R.H.

Weather: Sunny, 35°F

Purging Device: stainless steel bailer

Time Evacuated: 3:45 pm

Comments and Observations: DTW 24.46' time 4:20 pm

Collection

Date: 12/15/92 Crew: K.K. R.H.

Weather: Sunny, 35°F

Time of Collection: 4:20 pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.11</u>	<u>1359</u>	<u>12.4</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-75

Physical Observations: very turbid brown, with silt.
turbidity 7100 ntu

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: / /

Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYS DEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC - MW - 8 I

Sample Location: _____

Date: 12/17/92 Crew: K.K R.H

Weather: light rain, 38°F

Purging Device: stainless steel bailer

Time Evacuated: 9:50 am

Comments and Observations: DTW 33.58' at 2:00pm

Collection

Date: 12/17/92 Crew: K.K R.H

Weather: light rain, 38°F

Time of Collection: 2:00pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.30</u>	<u>1127</u>	<u>13.7</u>
_____	_____	_____
_____	_____	_____

Identification: JC - MW - 8 I

Physical Observations: cloudy brown, with silt particulates
turbidity > 100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1
Supervisor

WELL SAMPLING FIELD SHEET

Client Name: Johnson City - NYSDEC

Address: Kirkwood, NY

Contact: Scott Rodabaugh Phone: (607) 773-7763

Evacuation

Sample Point: JC-MW-95

Sample Location: _____

Date: 12/17/92 Crew: K.K R.H

Weather: light rain, 38°F

Purging Device: stainless steel bailer

Time Evacuated: 10:20am

Comments and Observations: DTW - 24.06 at 2:35pm

Collection

Date: 12/17/92 Crew: K.K R.H

Weather: light rain, 38°F

Time of Collection: 2:35pm Sampling Device: stainless bailer

Field Measurements:

pH Units	Specific Conductance (umhos/cm)	Temp., (°C)
<u>7.13</u>	<u>1067</u>	<u>13.7</u>
_____	_____	_____
_____	_____	_____

Identification: JC-MW-95

Physical Observations: cloudy brown, with silt particulates. turbidity >100 ntu.

Laboratory: IEA

Comments: _____

Reviewed by: _____ Date: 1/1
Supervisor

PROJECT TITLE: Johnson City
 PROJECT NO.: 35328
 STAFF: J. CARUSO
 DATE: 12-3-92

WELL NO.:	WELL I.D.	VOL. GAL./FT.
MW-95		
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>30</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>22.5</u>	3"	0.38
	4"	0.66
④ VOLUME OF WATER IN CASING (GAL.) <u>1.275</u>	5"	1.04
	6"	1.50
	8"	2.60

$V = 0.0408 (2)^2 \times (30 - 22.5) = 1.224$ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	0	22.5	52.5	67.5	82.5	97.5	125	126	142	157	164.5	
pH												
Spec. Cond. (µmho)												
Turbidity (NTU)	7200	84	68	75	180	108	88	68	54	49		
Temperature (°C)												

COMMENTS:

PROJECT TITLE: Johnson City
 PROJECT NO.: 35328
 STAFF: J. CARUSO
 DATE: 12-3-92

WELL NO.: <u>MW-8I</u>	WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.): <u>59.5</u>	1"	0.04
② CASING INTERNAL DIAMETER (in.): <u>2</u>	2"	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.) <u>31.4</u>	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.) <u>4,777</u>	4"	0.66
	5"	1.04
	6"	1.50
	8"	2.60

$$V = 0.0408 (2)^2 \times (59.5 - 31.4) = \underline{4.586} \text{ GAL. (3 casings)}$$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	136	196	216	236	256	276			
pH										
Spec. Cond. (µmho)										
Turbidity (NTU)	720	70	180	108	82	62	48			
Temperature (°C)										

COMMENTS:

APPENDIX E

LABORATORY ANALYTICAL RESULTS NYSDEC

SAMPLE ID 1-001



Volatiles

448 BROAD STREET, WAVERLY, NY 14892-1445
TELEPHONE (607) 565-2893 FAX (607) 565-4083

DATE : Nov 2, 1992

LAB SAMPLE ID : 70853

NYS D.B.C.
Scott Rodabaugh
Route 11

Kirkwood NY 13795

SAMPLE SOURCE	DAY & NIGHT: J.C.
ORIGIN	BORING #1
DESCRIPTION	GRAS
SAMPLED ON	10/13/92 by SR
DATE RECEIVED	10/13/92
P.O. NO.	

FLI 8240	Analyst : DMB	Notebook Reference : 92-030-2335
Method : SW806/8240/5030	Units : UG/L	Date Analyzed : 10/20/92
Compounds Detected	Results	Maximum Contaminant Level
-----	-----	-----
Dichlorodifluoromethane	ND<1000	
Chloroethane	ND<1000	
Vinyl Chloride	ND<1000	
Bromomethane	ND<1000	
Chloroethane	ND<1000	
Trichlorofluoromethane	ND<1000	
1,1,-Dichloroethene	ND<1000	
Methylene Chloride	ND<1000	
trans-1,2-Dichloroethene	ND<1000	
1,1-Dichloroethane	ND<1000	
cis-1,2-Dichloroethene	ND<1000	
1,1,1-Trichloroethane	ND<1000	
Carbon Tetrachloride	ND<1000	
Benzene	10500	
1,2-Dichloroethane	ND<1000	
Trichloroethene	ND<1000	
1,2-Dichloropropane	ND<1000	
Dibromomethane	ND<1000	
2-Chloroethylvinylether	ND<1000	
cis-1,3-Dichloropropene	ND<1000	
Toluene	9310	
trans-1,3-Dichloropropane	ND<1000	
1,1,2-Trichloroethane	ND<1000	
Tetrachloroethene	ND<1000	
Chlorobenzene	ND<1000	

*COMMENT: DUE TO THE LOW SURROGATE RECOVERY, THE SAMPLE WILL BE RE-ANALYZED 10/28/92.

For questions regarding this report, please call and ask for Linda Shoemaker, Manager, Customer Services.

cc :

APPROVED BY:

Lindsey Brown
MANAGER

The information in this report is accurate to the best of our knowledge and ability. In no event shall our liability exceed the cost of these services. Your samples will be discarded after 14 days unless we are advised otherwise.

NY LAB	PA LAB	NJ LAB	MA LAB	RI LAB	EPA LAB	NVLAP
10252	# 68180	# 73168	# AA000048	ORIGINAL	# AAL-049C3 # NY 033	# 1393



REPORT

Volatiles

446 BROAD STREET, WAVERLY, NY 14892-1445
 TELEPHONE (607) 565-2893 FAX (607) 565-4083

DATE : NOV 2, 1992

LAB SAMPLE ID : 70853

NYS D.E.C.

SAMPLE SOURCE	DAY & NIGHT-J.C.
ORIGIN	BORING #1
DESCRIPTION	GRAB
SAMPLED ON	10/13/92 by SR
DATE RECEIVED	10/13/92
P.O. NO.	

1,1,1,2-Tetrachloroethane	ND<1000
Ethylbenzene	ND<1000
p-Xylene/m-Xylene	3008
o-Xylene	1430
Styrene	ND<1000
Bromobenzene	ND<1000
1,1,2,2-Tetrachloroethane	ND<1000
1,2,3-Trichloropropane	ND<1000
2-Chlorotoluene	ND<1000
4-Chlorotoluene	ND<1000
1,3-Dichlorobenzene	ND<1000
1,4-Dichlorobenzene	ND<1000
1,2-Dichlorobenzene	ND<1000
Chloroform(Trichloromethane)	ND<1000
Bromodichloromethane	ND<1000
Dibromochloromethane	ND<1000
Bromoform(Tribromomethane)	ND<1000
Acetone	ND<1000
Vinyl Acetate	ND<1000
MEK(2-Butanone)	ND<1000
MIBK(4-Methyl-2-pentanone)	ND<1000
2-Hexanone	ND<1000
Allyl Chloride(3-Chloro-1-propene)	ND<1000
EDB(1,2-Dibromoethane)	ND<1000
DBCP(1,2-Dibromo-3-chloropropane)	ND<1000
Acrolein	ND<10000
Acrylonitrile	ND<10000
Surrogate Recovery (%)	
1,2-Dichloroethane-d4	103
Toluene-d8	103
Bromofluorobenzene	99

* FLI 1240
 Method : 9806/1010/5030
 Compounds Detected

Analyst : DMB
 Units : UC/L
 Results

Notebook Reference : 92-220-524
 Date Analyzed : 10/27/92
 Maximum Contaminant Level

1,1,1-Trichloroethane

ND<0.5

APPROVED BY:

Judsey Brown
 MANAGER

The information in this report is accurate to the best of our knowledge and ability. In no event shall our liability exceed the cost of these services. Your samples will be discarded after 14 days unless we are advised otherwise.

NY LAB
 # 10252

PA LAB
 # 68180

NJ LAB
 # 73168

MA LAB
 # AA000046

ORIGINAL

RI LAB
 # AAL 049C3

EPA LAB
 # NY 033

NVLAP
 # 1391



REPORT

Volatiles

448 BROAD STREET, WAVERLY, NY 14592-1445
 TELEPHONE (607) 565-2893 FAX (607) 565-4083

DATE : Nov 3, 1992.

LAB SAMPLE ID : 70853

NYS D.E.C.

SAMPLE SOURCE	DAY & NIGHT-J.C.
ORIGIN	BORING #1
DESCRIPTION	GRAB
SAMPLED ON	10/13/92 by SR
DATE RECEIVED	10/13/92
P.O. NO.	

Surrogate Recovery (%)
 ELCO

36

**Trichloroethane
 Method : EPA 502.2
 Compounds Detected

Analyse : CPW
 Units : ug/L
 Results

Notebook Reference : 92-211-510
 Date Analyzed : 10/28/92
 Maximum Contaminant Level

1,1,1-Trichloroethane
 Surrogate Recovery (%)
 ELCO

ND<25
 83

**COMMENT: 1,1,1-Trichloroethane was re-analyzed for lower detection limits.

AMENDED REPORT

APPROVED BY.

[Signature]
 MANAGER

The information in this report is accurate to the best of our knowledge and ability. In no event shall our liability exceed the cost of these services. Your samples will be discarded after 14 days unless we are advised otherwise.

NY LAB
 # 10252

PA LAB
 # 68180

NJ LAB
 # 73168

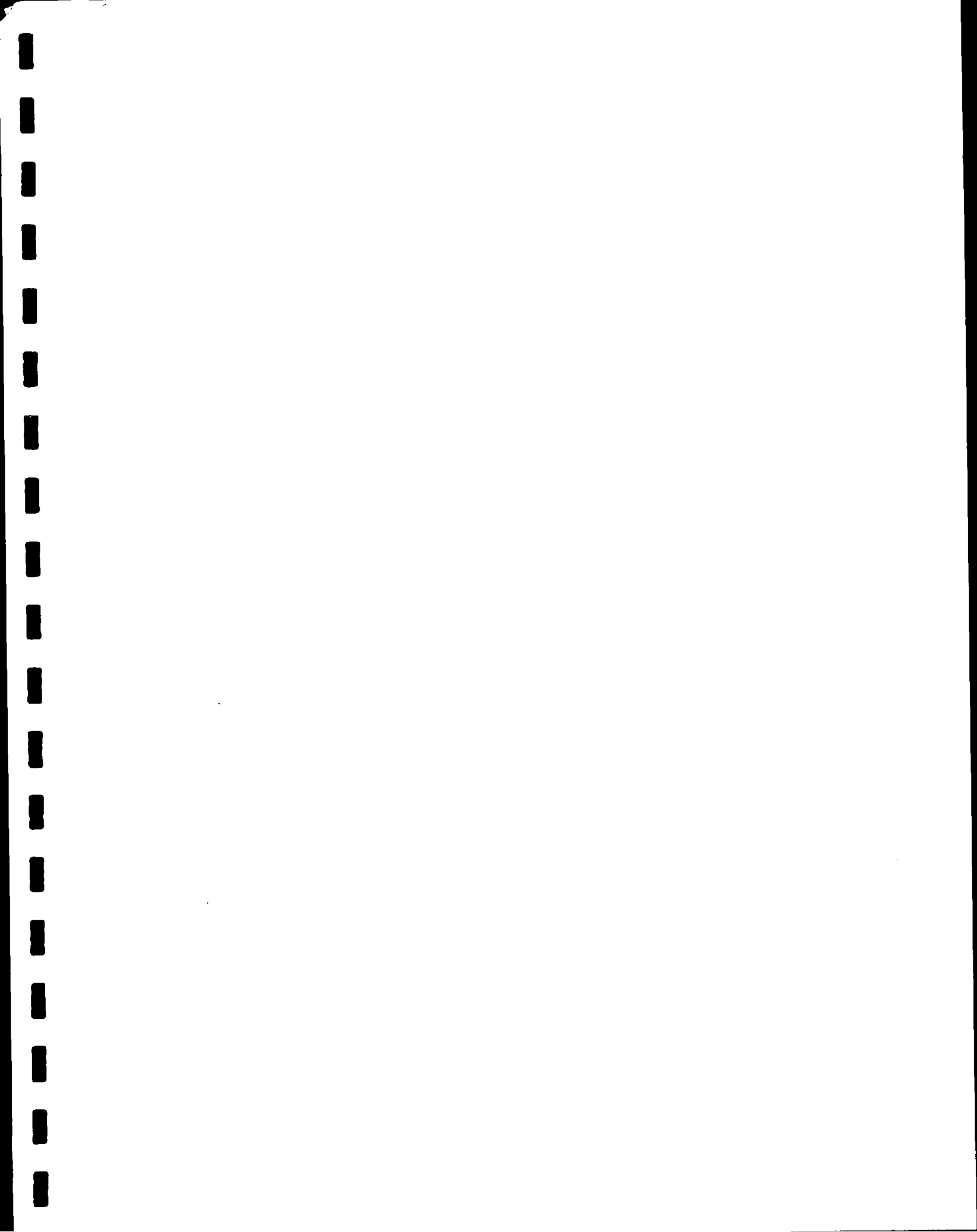
MA LAB
 # AA000046

ORIGINAL

RI LAB
 # AAL-049C3

EPA LAB
 # NY 033

NVLAF
 # 139:



RECEIVED
1963
CONSTRUCTION SERVICES