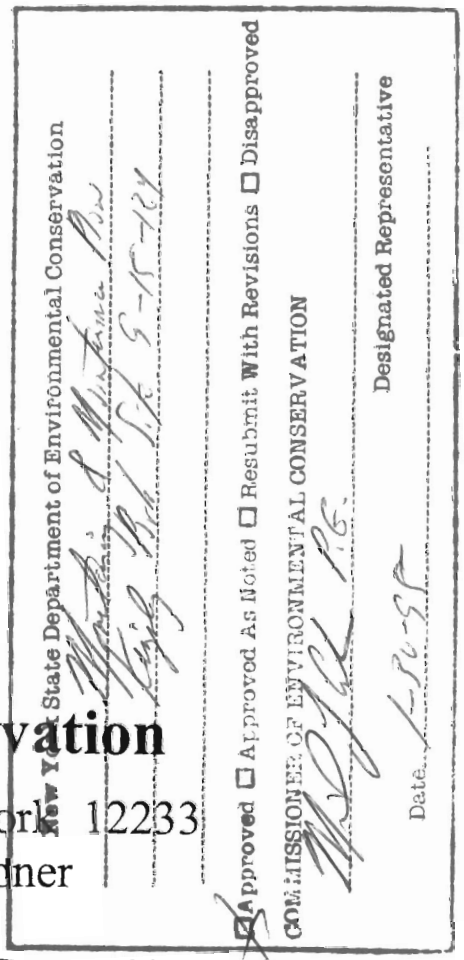
915124

NY STATE SUPERFUND STANDBY CONTRACT
DIARSENOL COMPANY - KINGSLEY PARK SITE
City of Buffalo, Erie County

WORK ASSIGNMENT NO. D002478-28
SITE NO. 9-15-124

PREPARED FOR



New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233
Langdon Marsh, Commissioner

Division of Hazardous Waste Remediation

Michael J. O'Toole, Jr., P.E., Director

PREPARED BY

ES
ENGINEERING-SCIENCE
Liverpool, New York

JANUARY 1995
M:\graphics\726035\26035cv1.ds4

SITE MONITORING AND MAINTENANCE PLAN

FOR

DIARSENOL COMPANY, KINGSLEY PARK SITE
(SITE NO. 9-15-124)

BUFFALO, NEW YORK

SUBMITTED TO:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ALBANY, NEW YORK

PREPARED BY:

ENGINEERING-SCIENCE, INC.
290 ELWOOD DAVIS ROAD
LIVERPOOL, NEW YORK 13088

JANUARY 1994

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

SECTION 1

INTRODUCTION

This document presents a monitoring and maintenance operations plan for the shallow groundwater collection system and the nine groundwater monitoring wells at the Diarsenol Company, Kingsley Park Site. The plan describes groundwater monitoring, groundwater collection system inspection, and reporting requirements. This plan also contains detailed instructions to be used to assure efficient monitoring, groundwater sampling and analysis, and maintenance of groundwater collection system components.

1.1 PROJECT BACKGROUND

1.1.1 Site Location and Description

The Diarsenol Company, Kingsley Park Site is an Inactive Hazardous Waste Site (No. 915124) located in the City of Buffalo, Erie County, New York (Figure 1.1). The site is situated in an urban residential neighborhood and is bounded by Kingsley Street on the south, Riley Street on the north, and is east of Jefferson Avenue and west of Roehrer Avenue. Homes are located in close proximity to the Park along both Riley Street and Kingsley Street. The site is approximately 2 acres in size. There are no nearby bodies of water and the site is flat with no more than one to two feet of local topographic relief.

The Diarsenol Company was a pharmaceutical manufacturer which produced an arsenic based medication consisting of up to 31 percent arsenic. The company operated from 1925 until the early 1940s at the Kingsley Park location. From the 1940s until 1967, various owners occupied the site. In 1967, the City of Buffalo acquired the property and by 1972 all the Diarsenol buildings were removed and a public park and playground were in place.

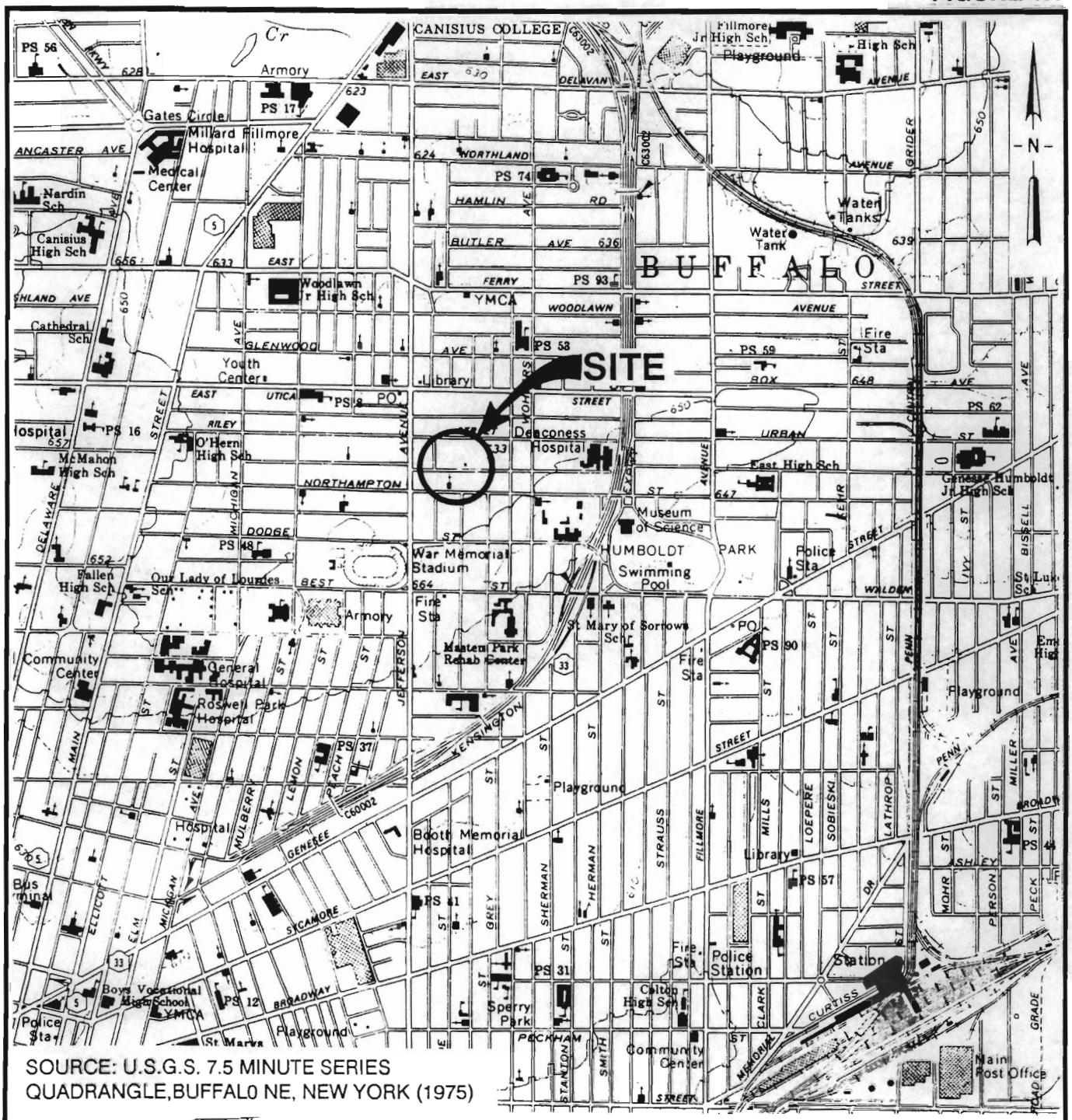
It is suspected that off-specification products or unused raw materials were disposed behind the former building in a depression detected during the site investigation. A second possible explanation for the site contamination is that at the time of building demolition, material inside the structure was released to the environment and moved around during grading activities.

1.1.2 Remedial History

A number of sampling efforts and environmental investigations have been conducted at the Kingsley Park site. Previous activities include sampling by the Erie County Department of Environmental Planning (1983), NUS Corp. (1986), Ecology & Environment (NYSDEC Phase II Study - 1989), and the New York State Department of Health (NYS DOH) (June and July, 1990).

In September 1990, the New York State Department of Environmental Conservation (NYSDEC) requested that Engineering-Science, Inc. (ES) conduct an

FIGURE 1.1



SOURCE: U.S.G.S. 7.5 MINUTE SERIES
QUADRANGLE, BUFFALO NE, NEW YORK (1975)

QUADRANGLE LOCATION

SITE LOCATION MAP

DIARSENOL COMPANY
KINGSLEY PARK SITE
BUFALO, NEW YORK

SCALE: 1" = 2,000'

2,000 0 2,000 FEET

Interim Remedial Investigation (IRI) of the Kingsley Park site. The IRI consisted of the collection and analysis of surface and shallow subsurface soil samples from the park and surrounding properties, installation of 14 soil borings, and construction of one groundwater monitoring well, which was later sampled. Soil sampling determined that shallow soils in the park and in adjacent yards, as well as a localized area of deeper soils in the park, were contaminated with arsenic at levels ranging from background, which was determined to be 10-20 parts per million (ppm), to 7,090 ppm.

The ES IRI Report was completed in February 1991. In March 1991, the NYSDEC approved the report, prepared a bid package, and procured a contractor for an Interim Remedial Measure (IRM). The IRM consisted of the excavation and removal of soils containing elevated arsenic levels from the park and surrounding properties, backfilling and restoration, and the installation of four groundwater monitoring wells. During the IRM, a total of 11,549 tons of arsenic contaminated soil were removed from the site. Of this total, 1,981 tons of soil were disposed of as hazardous waste and 9,568 tons as non-hazardous waste. The construction phase of the IRM was completed in June 1992.

Following completion of the IRM, the new wells were sampled and arsenic was detected at levels exceeding groundwater standards. Two additional rounds of groundwater sampling were conducted by ES in 1992 at the Kingsley Park site. Arsenic was detected at levels exceeding groundwater standards in three of the five site wells. In order to address this contamination, the NYSDEC issued a work assignment to ES in June 1993 to conduct a Supplemental Remedial Investigation/Feasibility Study (RI/FS). ES completed the field investigation in December 1993, and a final report was issued in February 1994.

A Record of Decision (ROD) was signed on March 31, 1994 which called for the installation of a shallow groundwater collection system which would collect groundwater in areas where groundwater fails to meet standards and convey the collected groundwater to a municipal sewer line. The ROD also called for continued monitoring of site groundwater.

1.1.3 Remedial Action

ES completed the remedial design in October 1994 and provided construction management for the installation of a shallow groundwater collection system in November 1994. Construction was completed on November 25, 1994 and consisted of the installation of an approximately 7-foot deep subdrain trench in the vicinity of MW-1, MW-2 and MW-3 (see Appendix A for as-built drawings). The collection system utilizes the relatively high permeability fill installed previously during the IRM and crushed stone to collect the contaminated groundwater. Collected groundwater is discharged to the sanitary sewer system under Riley Street. The collection trench is equipped with a groundwater sampling port which will be monitored, along with the nine groundwater monitoring wells installed on site, as part of this Monitoring and Maintenance Plan.

1.2 SITE GEOLOGY AND HYDROGEOLOGY

Geologic conditions at the site consist of zero to eight feet of fill and an unknown thickness of glacial silty clay to clayey silt with sand lenses, underlain by bedrock. The fill includes clean soil imported to regrade the excavation left from soil removal during the IRM and some old fill left from historic site demolition and grading. Most of the unpaved areas are covered with two feet of clean fill. Four to eight feet of clean fill exists in an area roughly bounded by MW-2, MW-3, MW-4 and MW-5 (Appendix A) The new fill is a fine to medium sand.

There are two hydrogeological units at the site: The overburden soil and the bedrock. It appears that the shallow groundwater may be perched in the clayey soil and is recharged by precipitation infiltration. The bedrock aquifer is separated by the clayey glacial soil, and therefore, should not be affected by the shallow water bearing zone.

The depth of site groundwater fluctuates significantly from season to season. During high precipitation months, such as December and January, groundwater depths ranged from less than 1 foot to 4.6 feet below grade. In the relatively dryer months, such as August, groundwater depths ranged from 3.5 feet to more than 7 feet below grade.

1.3 ORGANIZATION OF MONITORING AND MAINTENANCE OPERATIONS PLAN

This plan is organized into three sections, including this introduction (Section 1). Section 2 provides a description of groundwater monitoring including quality assurance/quality control and reporting. Section 3 contains a description of system maintenance. As-built drawings, a monitoring well summary table, sampling forms/information, and a site health and safety plan for field activities are contained in Appendices A, B, C, and D, respectively.

SECTION 2

GROUNDWATER MONITORING

This section describes the procedures for sampling the monitoring wells and the groundwater collection system sampling port; for analysis of samples; and for evaluation of sample results.

2.1 GROUNDWATER MONITORING LOCATIONS

2.1.1 Monitoring Wells

Nine groundwater monitoring wells shown on Figure 2.1 will be monitored to assess groundwater quality beneath the park and surrounding properties. Five monitoring wells were installed prior to and during the IRM (MW-1, MW-2, MW-3, MW-4, and MW-5) and four monitoring wells were installed as part of the Supplemental RI/FS (MW-6, MW-7, MW-8, and MW-9). A summary of the monitoring well data is included in Appendix B.

Four rounds of groundwater level measurements have been taken at the site since July 1992. Based on existing water level data, there is no uniform horizontal groundwater flow direction, and there are no consistent differences in the hydraulic potentials at the different wells. This is probably due to the relatively flat topography and low permeability of the soil. Groundwater level measurement data obtained after the IRM, during 1993, and during the Supplemental RI are summarized in Table 2.1.

2.1.2 Sampling Port

The groundwater collection system is equipped with a sampling port located within the park fence and approximately 60 feet west of MW-2 (see as-built drawings in Appendix A). This sampling port will be used to monitor the quality of the discharge to the sanitary sewer system.

2.2 GROUNDWATER SAMPLING AND ANALYSIS

2.2.1 Frequency of Sampling

Groundwater sampling and analysis of all wells will be conducted annually. The groundwater collection system discharge will be sampled and analyzed quarterly per Buffalo Sewer Authority requirements.

2.2.2 Sample Container Preparation

Sample containers will be properly washed and decontaminated by the laboratory prior to use. The containers will be tagged and Chain of Custody initiated before shipping to the sampling site in coolers. The types of containers and preservation techniques are shown in Table C.1, Appendix C. Since all bottles will contain the necessary preservatives, they need only be filled. Following sample collection, the

FIGURE 2.1

MONITORING WELL LOCATION MAP

DIARSENOL-KINGSLEY PARK SITE
City of Buffalo, Erie County

NORTH

RILEY STREET

HSE 381
HSE 383
HSE 387
HSE 389
HSE 395
HSE 399
HSE 409
HSE 413
HSE 417
HSE 419
HSE 423
HSE 431
HSE 433
HSE 437
HSE 439

GARAGE
GARAGE
GARAGE

MW-9
EL. 639.45

EL. 639.60
MW-8

MW-7
EL. 641.06

MW-2
EL. 640.71

MW-3
EL. 641.06

MW-1
EL. 640.71

MW-5
EL. 640.49

MW-6
EL. 640.61

MW-4
EL. 639.87

BASKETBALL COURTS

POOL

COVERED PAVILION

POOL HOUSE

PLAY AREA

BASE POINT

HSE 90
HSE 94
HSE 104

CHURCH

KINGSLEY STREET

APPROXIMATE SCALE FEET
0 20 40 60 FT.

LEGEND:
EL. 640.95 TOP OF PVC CASING ELEVATION

FENCE

PAVED AREAS

MW-1 MONITORING WELL LOCATION

REVISED: 01/31/94
001631\D:\SY188\SY188001.DWG

2-2

ENGINEERING-SCIENCE
DESIGN * RESEARCH * PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, NEW YORK 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

TABLE 2.1
GROUNDWATER ELEVATION SUMMARY

Diarsenol Company–Kingsley Park Site
Buffalo, New York

MONITORING WELL	TOC ELEVATION (feet)	GROUND SURFACE ELEVATION (feet)	Round 1: 7/16/92		Round 2: 8/25/92		Round 3: 12/28/93 – 12/29/93		Round 4: 1/28/94	
			DEPTH TO WATER (ft. below TOC)	GROUNDWATER ELEVATION (feet)	DEPTH TO WATER (ft. below TOC)	GROUNDWATER ELEVATION (feet)	DEPTH TO WATER (ft. below TOC)	GROUNDWATER ELEVATION (feet)	DEPTH TO WATER (ft. below TOC)	GROUNDWATER ELEVATION (feet)
MW – 1	640.71	641.1	dry	NA	7.44	633.27	4.00	636.40	4.59	636.12
MW – 2	640.71	641.1	3.50	637.20	4.76	635.95	2.50	638.21	1.49	639.22
MW – 3	641.06	641.3	4.90	636.16	6.12	634.94	3.75	637.31	2.35	638.71
MW – 4	639.87	640.9	4.70	635.17	4.90	634.97	3.80	636.07	under water	NA
MW – 5	640.49	640.9	4.50	635.99	3.78	636.71	2.80	637.69	under water	NA
MW – 6	640.61	640.9	--	--	--	--	1.95	638.66	under water	NA
MW – 7	640.64	640.9	--	--	--	--	2.35	638.29	0.87	639.77
MW – 8	639.60	640.0	--	--	--	--	2.48	637.12	1.34	638.26
MW – 9	639.45	639.6	--	--	--	--	3.44	636.01	3.32	636.13

NA = Not Applicable; The groundwater elevation could not be calculated as the well was dry or submerged.
-- Well was not yet installed.

bottles will be placed on ice in the shipping cooler. The samples will be cooled to 4°C. but not frozen.

2.2.3 Field Procedures

The following is a step-by-step sampling procedure to be used to collect the groundwater samples from both the monitoring wells and the sampling port. Sampling procedures will be recorded on the Well Sampling Record contained in Appendix C.

- Assemble all field equipment necessary for sample collection (Table C.2, Appendix C).
- Inspect equipment to ensure it is working properly.
- Open the field blank sample bottle and set it aside in a location where it will not be spilled and will not receive precipitation.
- Open the sampling port cap and observe the inflow from the groundwater collection system with a flashlight. If no inflow or very little inflow is observed, collect a grab sample using a dedicated bailer. If sufficient inflow to recharge the sampling port pit is observed, purge the sampling port by removing a minimum of three pit volumes of water. Purging will be conducted with a dedicate bailer lowered by a dedicated nylon line. Proceed with sample collection, field testing, recording, and shipping as detailed below for well samples.
- Purged sampling port water will be contained and subsequently discharged back into the sampling port after obtaining the necessary samples.
- Prior to sampling the monitoring wells, measure the static water level from the surveyed well elevation mark on the top of the casing with a water-level indicator. Water levels will be measured to nearest 0.01 foot and recorded on the Well Sampling Record (Figure C.1, Appendix C).
- Decontaminate the water-level indicator. (See Section 2.2.4 for decontamination procedures.)
- Purge each well by removing a minimum of three well volumes of water. Purged well water will be contained in buckets and subsequently discharged into the sanitary sewer system at the sampling port after sample collection. Discharge of purged well water will not be performed until after a water sample has been obtained from the sampling port. Purging will be conducted with a bailer or a centrifugal pump with a foot valve on the intake and dedicated polyethylene tubing. The centrifugal pump will be equipped with a gate valve on its discharge. If the well goes dry before the required volumes are removed, the well may be sampled when it recovers sufficiently.
- Collect samples from the well with a dedicated bailer lowered by a dedicated nylon line. Temperature, conductivity, and pH will be measured, and sample description and location noted on the Well Sampling Record (Figure C.1, Appendix C). Specific conductance, and pH will be measured by precalibrated electronic probes. Temperature will be measured by a precalibrated probe or thermometer.

- Fill the sample containers for volatile organic compounds first. Sample containers for the metals and other analytes will then be filled. Label containers using the method explained in Table C.3, Appendix C.
- Close the field blank bottle.
- The groundwater samples will be placed in a laboratory cooler, packed on ice and shipped overnight to the laboratory. Quality assurance blanks will be sent with each sample shipment. Chain-of-custody procedures will be strictly followed as outlined in Section 2.3.5.

2.2.4 Equipment Decontamination

Prior to sampling and between each sample, all non-dedicated equipment (bailers, water-level indicators, etc.) coming in contact with ground-water will be properly decontaminated. The decontamination procedure is as follows: (Water level indicator is used as an example.)

- Thoroughly clean the water-level indicator with a biodegradable detergent, such as Alconox and tap water.
- Triple rinse the water-level indicator with distilled water.
- Wipe dry using disposable paper towels.

At no time will washed equipment be placed directly on the ground.

2.2.5 Field Sample Custody

Evidence of sample traceability and integrity is provided by Chain-of-Custody (COC) procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, shipment, laboratory receipt and analysis (Figures C.2 and C.3, Appendix C). A sample is considered to be in a person's custody if the sample is:

- In a person's possession;
- Maintained in view after possession is accepted and documented;
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody; or
- In a secured area which is restricted to authorized personnel.

A COC record (Figure C.3, Appendix C) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample containment and preservation, and during return to the laboratory. Triplicate copies of the COC must be completed for each sample set collected.

The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

The REMARKS space is used to indicate if the sample is a matrix spike, matrix spike duplicate or matrix duplicate. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper airbill number on the top of the COC. Mistakes will be crossed out with a single line and initialed by the author.

One copy of the COC is retained by sampling personnel and the other copy is put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the sample signs his name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the designated person, and the sample will not be analyzed.

2.2.6 Sample Analysis

In accordance with the analysis requirement for Diarsenol Site discharge by Buffalo Sewer Authority, all groundwater samples will be analyzed for three metals, arsenic (total and dissolved), barium, cadmium, and one organic compound, bis (2-ethylhexyl) phthalate. All groundwater samples will be analyzed according to New York State Department of Environmental Conservation Analytical Services Protocol (NYSDEC ASP, December 1991). The laboratory data will be reported in a standard format with a summary of results. The methods to be used for the laboratory analysis of groundwater samples are presented below:

Parameter	Analytical Method
Metals	CLPM
Semi-Volatiles	91-2

After five years, the analytical parameters and sampling frequency will be re-evaluated based on the sampling results. If the level of contamination in groundwater declines or stabilizes, site groundwater monitoring may be reduced or terminated upon agreement with NYSDEC and Buffalo Sewer authority. The number of samples to be analyzed annually are summarized in Table 2.2.

2.2.7 Quality Assurance/Quality Control

In addition to water samples collected from monitoring wells, and the sample port two types of "blanks" will be collected and submitted to the chemical laboratory for analyses. The blanks will consist of 40 mL VOA vials, as follows:

TABLE 2.2

NUMBER OF GROUNDWATER SAMPLES FOR LABORATORY ANALYSIS PER SAMPLING EVENT

	Sampling Port[1]				
Parameter	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	MW[2]
Arsenic, Barium, Cadmium	1	1	1	1	9
Bis(2-ethylhexyl) phthalate	1	1	1	1	9
Duplicates	0	0	0	0	1
Field Blanks	0	0	0	0	1
MS/MSD	0	0	0	0	1
Total	2	2	2	2	21

(1) Sampled quarterly

(2) 1 sample/each well for 9 wells sampled annually

a. Trip Blank - A Trip Blank will be prepared before the sample bottles are sent by the laboratory. It consists of a sample of distilled, deionized water which accompanies the other sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples, where sampling and analysis for TCL volatiles is planned. The Trip Blank will be analyzed for TCL volatile organic compounds as a measure of the internal laboratory procedures and their effect on the results.

b. Field Blank - Field Blanks will be prepared before the sample bottles are sent by the laboratory. Field Blanks may be one of the following:

   Atmospheric Blank - To measure the contribution of atmospheric contaminants, a sample bottle of organic-free distilled, deionized water is prepared by the laboratory, and sent with the shipment of sample bottles. The blank is opened as sampling takes place. When sampling is completed, the blank is capped. The blank is utilized when sampling and analysis for volatile organic compounds is being performed. In these cases, the blank will be analyzed for TCL volatile organic compounds.

2.2.8 Evaluation of Monitoring Results and Reporting

The results of each monitoring event will be summarized quarterly in a letter report to be sent to the NYSDEC and the Buffalo Sewer Authority. The sampling analytical results will be compared against the Buffalo Sewer Authority Maximum Allowable Instantaneous Discharge (MAID) Limits as contained in Table 2.3 and the New York State Class GA Groundwater Standard as published in the Division of Water Technology and Operational Guidance Series: Ambient Water Quality Standards and Guidance Values (Revised October 1993 or most recent revision). The main contaminant of concern, arsenic, has a Class GA standard equal to 0.025 mg/l and a MAID limit of 1.0 mg/l. Exceedances will be noted in the quarterly report. Also included in the report will be copies of all data sheets, log books, sampling records, and laboratory analysis reports.

The annual groundwater level monitoring data will be plotted and contoured on a copy of the site plan. The contours will be analyzed to assess the effectiveness of ground water capturing by the subdrain system. The ground water contour map and the hydraulic assessment will be included in the report.

The NYSDEC offices responsible for this project are:

Mr. Martin Doster
Regional Hazardous Waste Remediation Engineer
New York State Department of Environmental Conservation
Division of Solid Waste Remediation
Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999
(716) 851-7220

and

TABLE 2.3

BUFFALO SEWER AUTHORITY DISCHARGE REQUIREMENTS

Parameter	MAID[1]
pH	5.0-12.0
Total Arsenic	1.8 mg/l
Total Barium	10.0 mg/l
Total Cadmium	1.0 mg/l
Bis (2-ethylhexyl) phalate	1.0 mg/l

(1) Maximum Allowable Instantaneous Discharge Limit

Mr. Gerald Rider, P.E.
Chief, Operation, Maintenance & Support Section
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

The Buffalo Sewer Authority office responsible for this project is:

Mr. James Caruso
Buffalo Sewer Authority
Industrial Waste Section
1308 City Hall
Buffalo, New York 14202-3378
(716) 851-4664

2.2.9 Health and Safety

All monitoring and maintenance activities conducted at the site will follow the requirements of the Health and Safety Plan (HASP). A copy of the HASP is provided in Appendix D.

SECTION 3

SYSTEM MAINTENANCE

3.1 INTRODUCTION

This section contains procedures for care and maintenance of the monitoring wells and subdrain system. Specific procedures include routine inspections, and routine maintenance.

3.2 ROUTINE INSPECTIONS

The site will be inspected a minimum of quarterly for as long as groundwater monitoring is required at the site. The site will be inspected for the integrity of the groundwater monitoring wells and the observable components of the subdrain system. The inspection can be conducted during the quarterly monitoring. A well inspection form is included in Appendix C (see Table C.4).

3.3 ROUTINE MAINTENANCE

Maintenance activities will be performed as determined necessary based on the routine inspections.

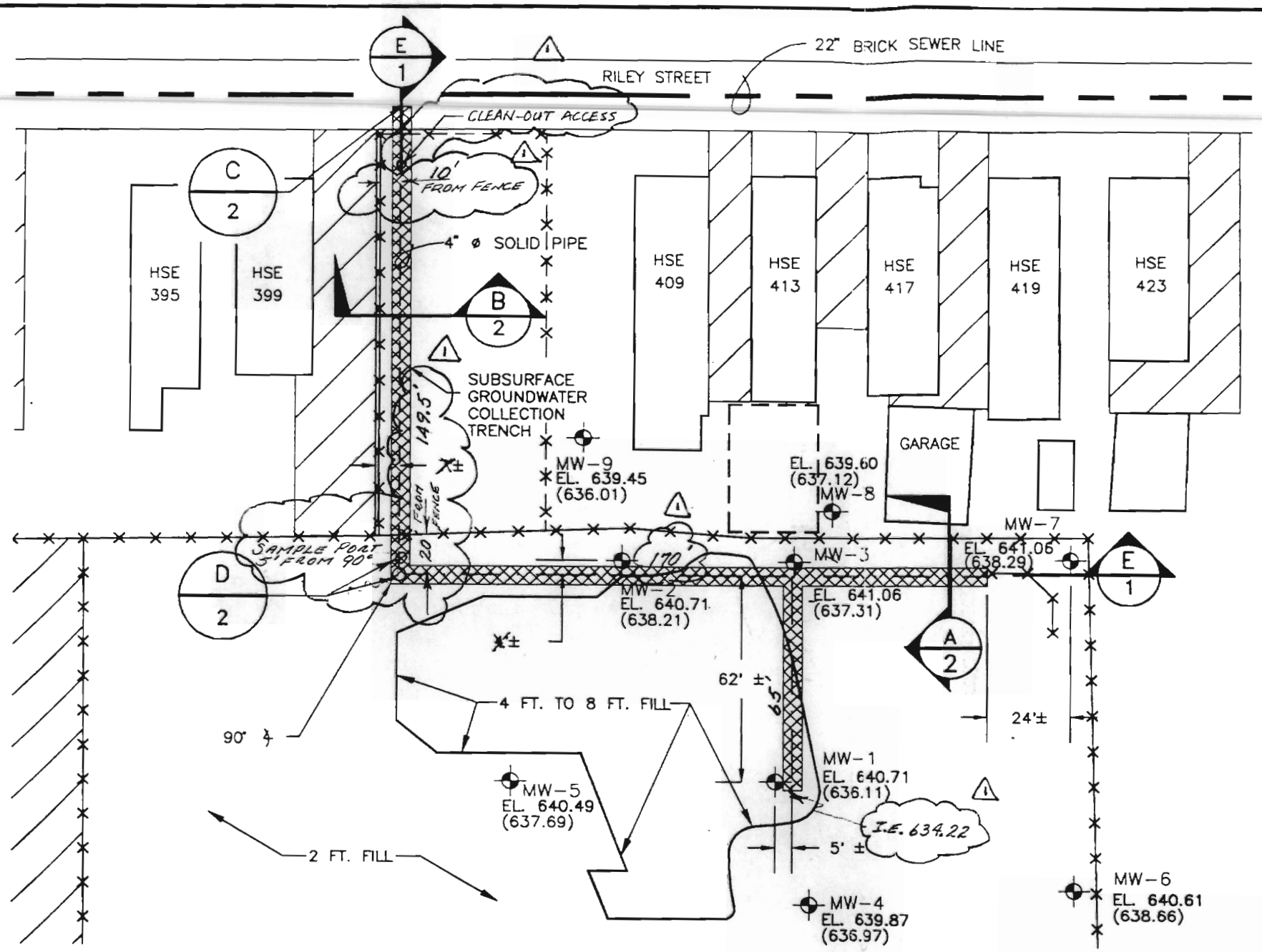
Monitoring wells which are damaged such that representative groundwater samples cannot be obtained will be repaired/replaced. Repair measures will be based on case-specific evaluation. Any well damaged beyond repair or rendered unusable will be replaced with a new well of similar depth and construction.

The subdrain sampling port and the cleanout are the only portions of the subdrain system that are visible for easy inspection. Any damage observed will be immediately repaired.

The cleanout is constructed from a 4-inch diameter Schedule 40 PVC pipe with a tee connection to the subdrain. The cleanout is protected with an aluminum cap at the ground surface. The cap can be removed to provide an access for removal of sediments and debris in the subdrain pipe. The cleaning water jet sewer cleaning system is typically used for the subdrain pipe cleaning, which consists of inserting a high pressure, flexible, water hose, with a reverse propelled jet nozzle to flush the sediments and debris into the sewer.

APPENDIX A

AS-BUILT DRAWINGS

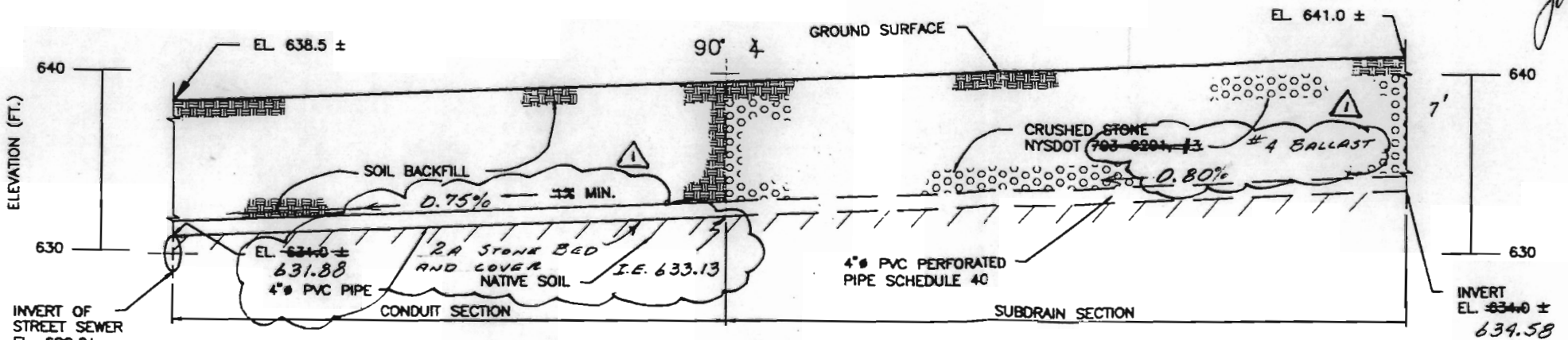


LEGEND:

EL. 640.95	TOP OF PVC CASING ELEVATION.
(636.97)	GROUND WATER ELEVATION ON DEC. 28 & 29, 1993.
	FENCE
	PAVED AREA
MW-1	MONITORING WELL LOCATION
	SUGGESTED TEMPORARY FENCE LOCATION

NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT THE CITY OF BUFFALO TO ARRANGE FOR TRAFFIC CONTROL, STREET PAVEMENT DISTURBANCE AND RESTORATION, UNDERGROUND UTILITY IDENTIFICATION, AND PROTECTION AND TEMPORARY CLOSURE OF THE PARK DURING THE CONSTRUCTION. THE SUBCONTRACTOR SHALL SECURE ANY NECESSARY PERMITS FROM THE CITY.
2. CLEARING, GRUBBING AND OTHER SITE DISTURBANCE SHALL BE MINIMIZED TO AREAS NECESSARY FOR THE CONSTRUCTION.
3. DRAINAGE PIPE INSTALLATION SHALL START FROM THE SEWER ON RILEY STREET.
4. TRENCH BACKFILL MATERIALS SHALL BE COMPACTED IN LIFTS OF LOOSE THICKNESS OF NOT MORE THAN ONE FOOT, WITH APPROPRIATE EQUIPMENT AND EFFORT, APPROVED BY THE INSPECTOR.
5. UPON COMPLETION OF THE CONSTRUCTION, THE SITE SHALL BE RESTORED TO ITS ORIGINAL CONDITIONS.



E/1 SUBSURFACE PROFILE
NOT TO SCALE

STATE OF NEW YORK
JOHN PATRICK McAULIFFE
LICENSED PROFESSIONAL ENGINEER
062655

40' 20' 0 40'
Approximate Scale in Feet

1 12-21-94 AS BUILT INFORMATION

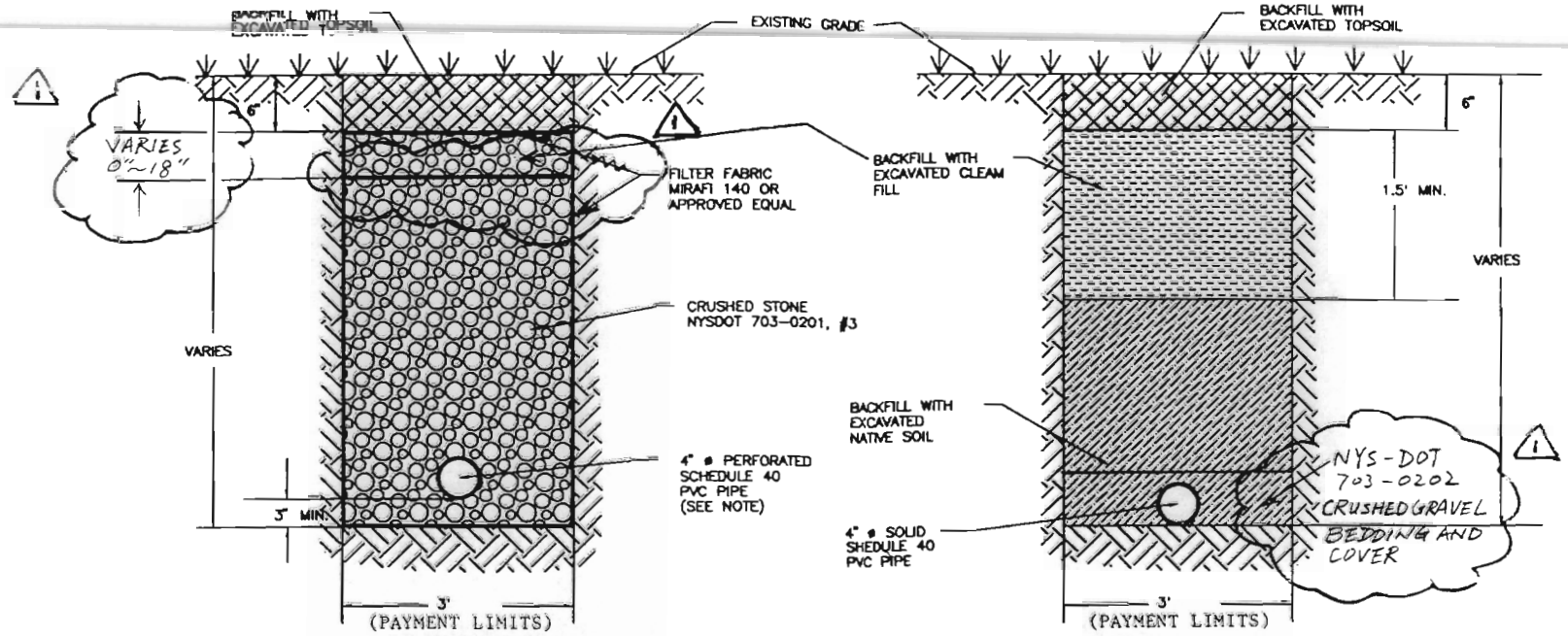
DRAWING No. 1

DIARSENSOL– KINGSLEY PARK SITE

~~PROPOSED~~
SUBSURFACE GROUNDWATER COLLECTION TRENCH LOCATION PLAN AND PROFILE

ENGINEERING–SCIENCE
DESIGN • RESEARCH • PLANNING
SYRACUSE, NEW YORK
ES

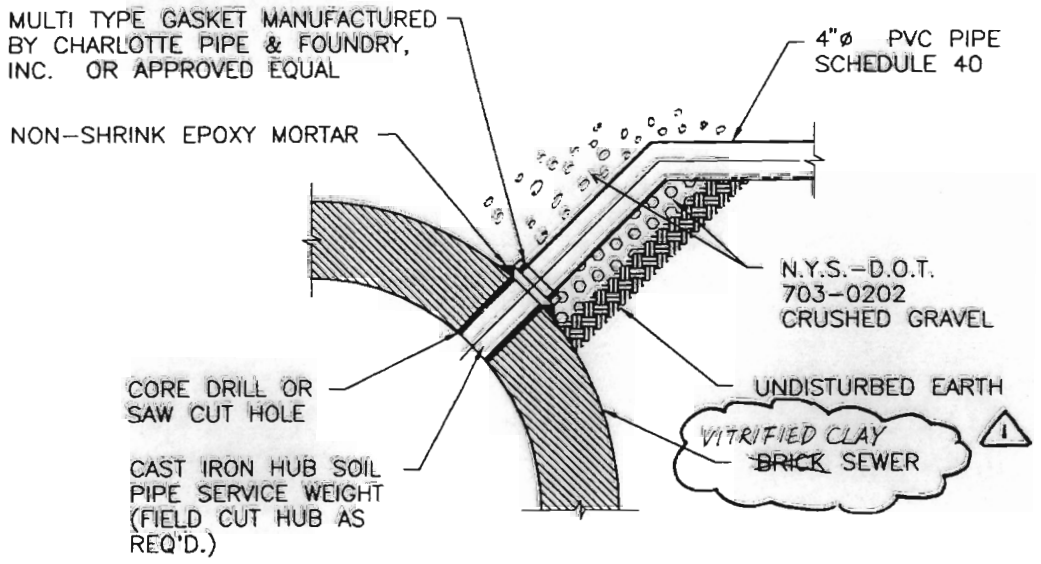
DATE: 9/20/94
M:\CAD\726035\26035G01.DWG (PSV: SITE, 1/40XP)



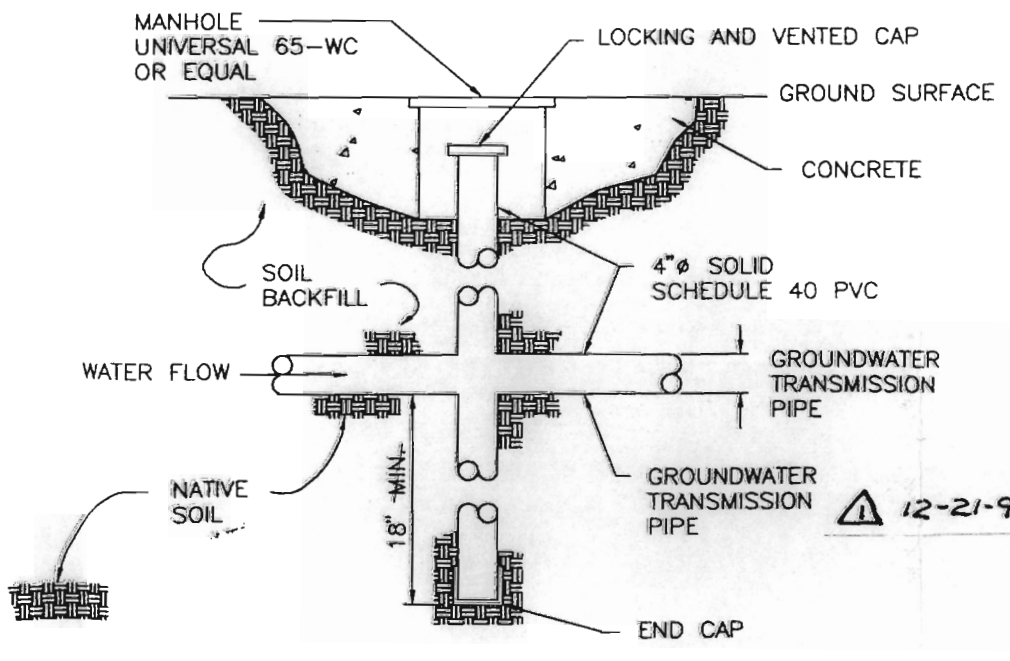
A/1 SUBDRAIN SECTION
NOT TO SCALE

B/1 CONDUIT SECTION
NOT TO SCALE

NOTE: THE UPGRADIENT END OF THE PIPE SHALL BE CLOSED WITH AN END CAP.



C/1 SEWER CONNECTION ELEVATION DETAIL
NOT TO SCALE



D/1 GROUNDWATER SAMPLING PORT DETAIL
NOT TO SCALE

STATE OF NEW YORK * JOHN PATRICK McALEER * LICENSED PROFESSIONAL ENGINEER 052655

1 12-21-94 AS BUILT INFORMATION

DRAWING No. 2

DIARSENOL- KINGSLEY PARK SITE

~~PROPOSED~~
SUBSURFACE GROUNDWATER COLLECTION TRENCH DETAILS

ENGINEERING-SCIENCE
DESIGN • RESEARCH • PLANNING
SYRACUSE, NEW YORK
ES

DATE: 9/20/94
M:\CAD\726035\26035G02.DWG

APPENDIX B

SUMMARY OF

MONITORING WELL DATA

SUMMARY OF MONITORING WELL DATA

Well Number	Date Installed	Total Depth (ft)	Size/ Type of Riser/ Screen	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)
MW-1	10/30/90	12.5	2" PVC	6.5	12.0
MW-2	5/18/92	13.0	2" PVC	5.5	13.0
MW-3	5/18/92	13.0	2" PVC	5.5	13.0
MW-4	5/18/92	13.0	2" PVC	5.5	13.0
MW-5	5/18/92	13.0	2" PVC	5.5	13.0
MW-6	12/22/93	12.5	2" PVC	4.5	12.5
MW-7	12/22/93	12.0	2" PVC	2.0	12.0
MW-8	12/21/93	14.0	2" PVC	3.5	13.5
MW-9	12/21/93	13.5	2" PVC	3.0	13.0

APPENDIX C

SAMPLING FORMS/INFORMATION

TABLE C.1

SAMPLE CONTAINERIZATION

Analysis	Bottle Type	Preservation[1]	Holding Time[2]
Aqueous Samples			
Metals	1 liter plastic bottle	Nitric Acid to pH <2	5 Days*
Semivolatile Organics	1000 ml glass	Cool to 4° C	5 Days*

[1] All samples to be preserved in ice during collection and transport.

[2] Days from validated time of sample receipt (VTSR)

* 5 days until extraction
40 days after extraction

TABLE C.2

GROUNDWATER SAMPLING EQUIPMENT

SAMPLING EQUIPMENT

- Photoionization detector
- Explosive gas meter
- Personal safety equipment (hard hats, etc.)
- Sampling and analysis program
- Appropriate number (including spares) of sample bottles
- Water-level indicator (electric drop-line)
- Polyethylene ground cloth
- Aluminum Foil
- Distilled water
- Alconox detergent
- Tap water source
- Disposable surgical gloves
- Disposable towels
- pH meter
- Conductivity meter
- Buckets (small: 5 gallon; large: 25 to 30 gallon)
- Well bailer
- Nylon rope (individual lengths for each well)
- Stainless steel submersible pumps
- Pump hoist
- Flashlight

SHIPPING AND PACKAGING EQUIPMENT

- Shipping labels
- Sufficient ice chests to hold all sample bottles, packing material and ice

DOCUMENTATION EQUIPMENT

- Well Sampling Record
- Chain-of-Custody Forms
- Waterproof Pens

TABLE C.3

METHOD FOR IDENTIFYING AND LABELING SAMPLES

LLLL*	LL*	LNN*	NNNN*
Site Diarsenol-Kingsley (DIKI)	Sample Type	Sample Location	Depth/Time

Site:	Diarsenol-Kingsley (DIKI).
Sample Type:	Soil (SO), waste material** (WA), groundwater (GW), surface water (SW), leachate (LC), sediment (SD), or air (AI).
Sample Location:	Numbered and referenced to a sample location map.
Sample Depth/Time	From the top of the bottom of the soil sample in feet below ground surface, or, for water and air samples, the time the sample is collected, in hours.

* L = Letter

* N = Number

** Waste material will be fully described in the logbook.

TABLE C.4
WELL INSPECTION CHECKLIST
DIARSENOL COMPANY KINGSLEY PARK

				Well Inspection (GOOD/FAIR/POOR OR YES/NO)									
Well Number	TOIC (1) Elevation (Ft/ASL) (NASL)	Well Depth (feet)	TOIC Water Level (feet)	Well Marking (G/F/P)	Casing Lock (G/F/P)	Protective Cover (G/F/P)	Well Cap (G/F/P)	Obstructions in Well (Y/ N)	Water in Annulet (Y/ N)	Concrete Pad (G/F/P)	Inspection Date	Comments	Volume Purged (Gallons)
MW-1	640.71	12.5											
MW-2	640.71	13.0											
MW-3	641.06	13.0											
MW-4	639.87	13.0											
MW-5	640.49	13.0											
MW-6	640.61	12.5											
MW-7	641.06	12.0											
MW-8	639.60	14.0											
MW-9	639.45	13.5											

(1) - TOP OF INNER CASING

FIGURE C.1

WELL SAMPLING RECORD

Site Name_____ Well_____ Date_____

Samplers:_____ of_____

_____ of_____

Intial Static Water Level (from top of well protective casing)_____

Evacuation:

Using: Submersible_____ Centrifugal _____ 2" Casing:___ft. of water x .16 =_____gals
Airlift _____ Positive Displacement_____ 3" Casing:___ft. of water x .36 =_____gals
Bailed _____ _____Times 4" Casing:___ft. of water x .65 =_____gals

Depth to intake from top of protective well casing _____

Volume of water removed_____Gals. (> 3 Well Volumes)

Sampling: Time_____ _____a.m.
_____p.m.

Bailer Type: Stainless Steel _____
Teflon _____
From Pos. Dis. Discharge Tube _____
Other_____ _____

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank	_____	_____	_____
Field Blank - Wash / Atmospheric (cirle one)	_____	_____	_____
Groundwater Sample	_____	_____	_____

Physical Appearance and Odor_____

_____

_____

Refrigerate: Date: _____ Time_____

Field Tests:

Temperature (C/F) _____ _____
pH _____ _____
Spec. Conduc (umhos/cm) _____ _____

Weather_____

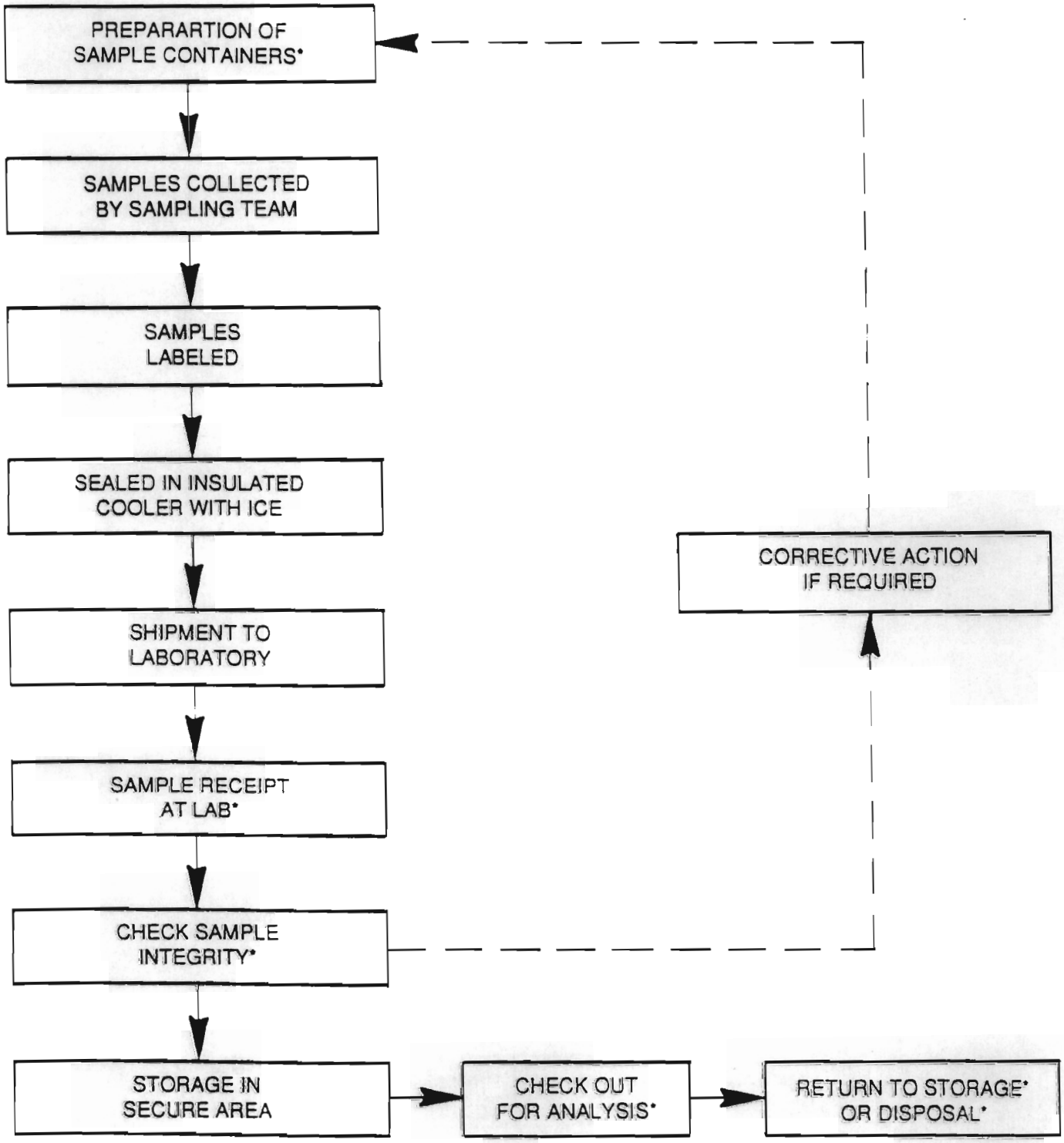
_____

Comments_____

_____

_____

SAMPLE CUSTODY



* Requires sign-off on Chain of Custody Form.

№ 0435

CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT NO.	PROJECT MGR:	TYPES OF ANALYSES REQUESTED	Send results to:
				ENGINEERING – SCIENCE, INC. 290 Elwood Davis Road Liverpool, NY 13088 Telephone: (315) 451–9560 Fax: (315) 451–9570
PROJECT NAME:	NOTES – (Reference QAPP and/or analytical protocols to be used):			Lab Submitted to:
SAMPLERS:				

FIELD SAMPLE ID: TYPE / NUMBER / DEPTH CODES / QC IDENTIFIERS	Location Description	Date	Time	GRAB	COMP	NO OF Bottles	Matrix / Preservative / Remarks
XX 001 001–002							

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	SHIPPED VIA: AIRBILL NO:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	SHIPPED VIA: AIRBILL NO:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	SHIPPED VIA: AIRBILL NO:

TYPE CODES:

SOLID
- SD – Sediment
- SS – Surface Soil
- SB – Subsurface Soil
- MW – Monitoring Well Boring
- TP – Test Pit/Tank Pit
- DR – Drum Waste
- WA – Solid Waste
- OS – Other Solid (eg. wipe samples, asbestos, etc.)

WATER
- MW – Monitoring Well
- LC – Leachate
- SW – Surface Water
- DW – Drill Water
- FD – Fuel Dispenser
- MH – Manhole
- OW – Oil Water Separator
- PR – Piping Run
- ST – Storm Water
- WW – Waste Water
- OL – Other Liquid (eg. Drum liquid)

QUALITY CONTROL
- FB – Field Blank (number each)
- TB – Trip Blank (number each)
- WB – Wash Blank (number each)

FIGURE C.3

No. 0436

APPENDIX D

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For

DIARSENOL CO./KINGSLEY PARK
84 KINGSLEY STREET
BUFFALO, NY

Prepared By:

ENGINEERING-SCIENCE, INC
290 ELWOOD DAVIS ROAD, SUITE 312
LIVERPOOL, NY 13088

AUGUST 1990

REVISED DECEMBER 1994

Reviewed and Approved By:

	Name	Date
ES Project Manager	Weiqun Xia	12/20/94
ES H&S Officer	Brian J. Powell	12/20/94

EMERGENCY CONTACTS

DIAL 911 FOR POLICE, FIRE, OR AMBULANCE.

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the site coordinator who will notify emergency personnel who will then contact the appropriate response teams. This emergency contacts list must be in an easily accessible location at the site.

Contingency Contacts	Phone Number
Poison Control Center	(800) 888-7655
ES Contract Physician (IMA)	(315) 478-1977 or (315) 432-9705
Medical Emergency - Deaconess Center Immediate Care Riley St., Buffalo --- 9 am to 7 pm	(716) 826-7000
Buffalo General Hospital 24 hr. Emergency Room 100 High Street, Buffalo	(716) 485-5600

ROUTE TO HOSPITAL (Deaconess Center):

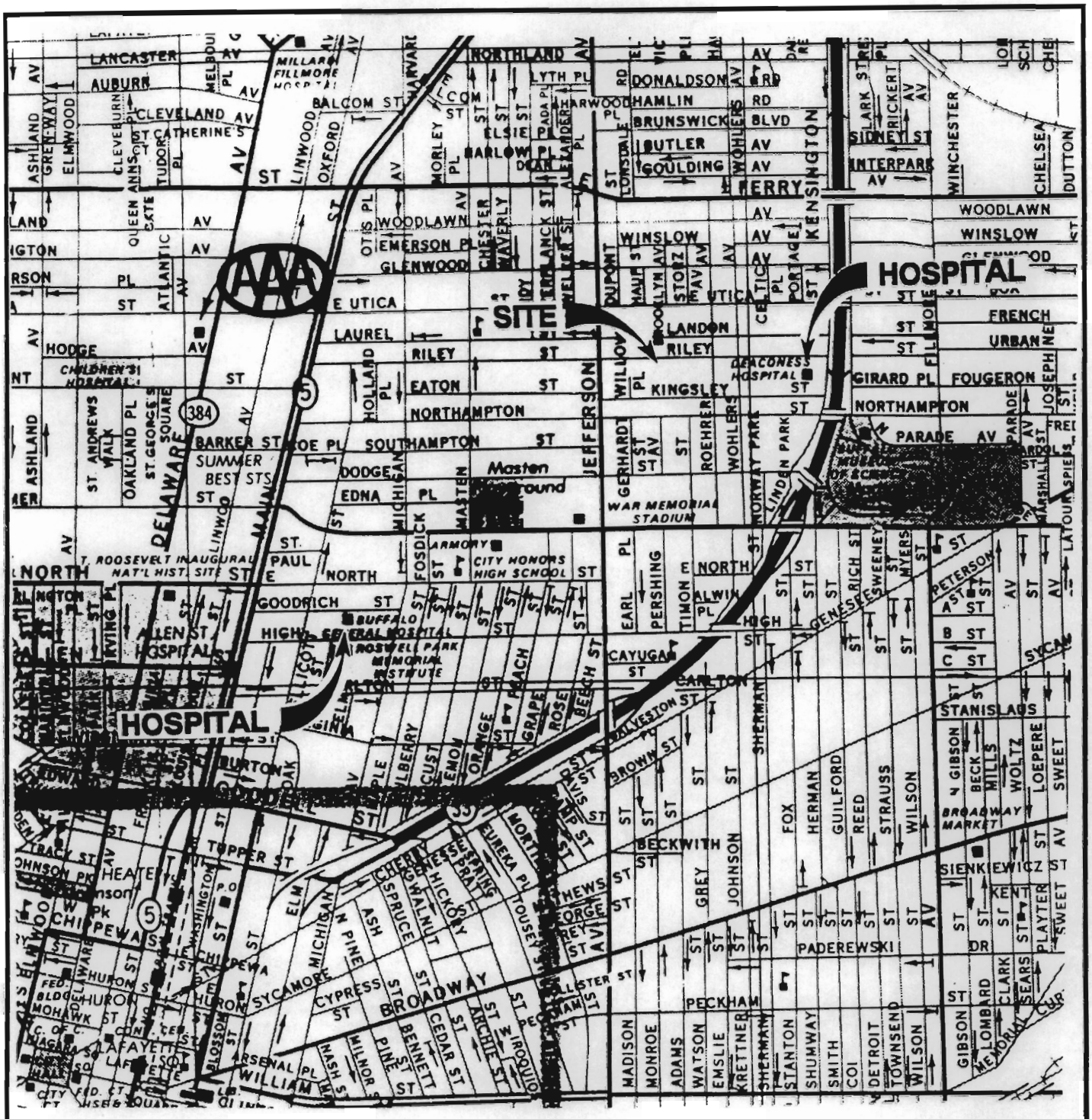
Head east on Kingsley St. about one block and make a left on Wohlers St. Go about one block to Riley St. and make a right. Hospital Immediate Care entrance will be on the right. SEE MAP, NEXT PAGE.

Travel time from site 5 minutes.

ROUTE TO HOSPITAL (Buffalo General Hospital):

Head west on Kingsley St. about one block and make a left on Jefferson Ave. Go three blocks south and make a right on North St., go eight blocks and turn left on Michigan Ave. and right onto Goodrich into Hospital Emergency Entrance. SEE MAPAve. and right onto G PAGE.

Travel time from site approximately 10 minutes.



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SCALE OF MILES

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ENGINEERING-SCIENCE

ROUTE TO HOSPITAL

DIARSENOL CO.

KINGSLEY PARK

1. INTRODUCTION

1.1 Purpose and Requirements

The purpose of this health and safety plan is to establish personnel protection standards and mandatory safety practices and procedures for field sampling and inspection efforts at the Diarsenol site.

The provisions of the plan are mandatory for all on-site personnel. At the Diarsenol site all personnel who engage in project activities must be familiar with this plan and comply with its requirements.

1.2 Scope of Work

Field tasks to be conducted at the site include:

- Groundwater Sample Collection
- Site Inspection and Maintenance

2. RISK ANALYSIS

2.1 Chemical Hazards

Potential contaminants which may be encountered while conducting field tasks at the Diarsenol site include arsenic in groundwater at levels above New York State Class GA standard. There is no hazardous waste on site and the ground is covered with clean soil fill.

In addition to the chemicals detected on site, some of the solvents used in the processing of samples and for the decontamination of equipment are potentially hazardous to human health if they are not used properly. Some or all of these compounds may be used in the current tasks to be performed at the site.

2.2 Explosion

No solvents were detected at the site therefore combustible and explosive potential is very low, except for the sampling port which is connected to a sanitary sewer under Riley Street. No sources of fire shall be introduced to or generated at the sampling port.

3. PERSONNEL PROTECTION

Level D protection will be worn for all activities. Level D protection will consist of:

- Coveralls
- Safety boots
- Nitrile outer and PVC inner gloves (must be worn during all sampling activities)
- Splash goggles (must be worn if a splash hazard is present)