New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

MONITORING AND MAINTENANCE MANUAL FOR THE ALMY BROTHERS SITE SITE NO. 7-04-021 BROOME COUNTY, NEW YORK

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Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
50 Wolf Road
Albany, New York 12233-7010

New York State Department of Environmental Conservation

Monitoring and Maintenance Manual

Almy Brothers Site

Site No. 7-04-021

☒ Approved ☐ Approved As Noted ☐ Resubmit With Revisions ☐ Disapproved

COMMISSIONER OF ENVIRONMENTAL CONSERVATION

Michael J. Carlson P.E.

Designated Representative 9/22/97

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1. INTRODUCTION

This is the Monitoring and Maintenance Manual for post-remediation groundwater monitoring at the Almy Brothers Site (No. 7-04-021) in Binghamton, Broome County, New York.

The remainder of this section describes the Almy Brothers project and the purpose of this manual; Section 2 provides background information on the site, Section 3 discusses selected remedial activities performed at the site; Section 4 describes the monitoring process; Section 5 describes site maintenance activities; and Section 6 presents health and safety issues and procedures for the site.

1.1 PROJECT DESCRIPTION

The Almy Brothers Site is an inactive hazardous waste site. A Remedial Investigation/Feasibility Study was performed by Dunn GeoScience Engineering Company, P.C. This resulted in a March 1994 Record of Decision which selected low temperature, base catalyzed decomposition thermal treatment of the contaminated soils. The remedy was completed in September 1997 and the site is in the monitoring and maintenance phase.

1.2 PURPOSE OF THE MAINTENANCE AND MONITORING MANUAL

This Maintenance and Monitoring Manual will be used as a tool to monitor and evaluate the performance and effectiveness of the selected remedial action. The performance and effectiveness is evaluated by monitoring contaminants of concern contained in groundwater. The manual is intended to provide detailed guidance and direction for the processes of:

- Sampling;
- Analysis;
- Site and equipment inspections; and
- Maintenance.

2. SITE INFORMATION

2.1 SITE DESCRIPTION

The Almy Brothers Site is located on the corner of Moore and Jackson Street in the City of Binghamton (Figure 2.1). The area is topographically flat-lying, situated approximately 500 feet south of the Susquehanna River. The area surrounding the site is mainly residential with some light industry including warehouses, a welding supply company, small construction firms and trucking companies.

The Almy Brothers Site consists of property which was once owned by Robert McMahon, former owner of McMahon Brothers, Inc., a pesticide/herbicide applicating company, and by Mary McMahon. The McMahons' property was sold in parcels to Leonard Almy and Louis Stilloe. Figure 2.2 shows the site vicinity with relative locations of buildings, parking lots and study areas.

Almy Brothers, Inc., operated a food and dried goods warehouse using two buildings owned by Leonard Almy, one on a parcel of land purchased in 1984 (Almy East) and one on a parcel purchased in 1987 (Almy West). Louis Stilloe purchased the parcel of land (10 Jackson Street) adjacent to the Almy East property in 1988. A portion of the building owned by Louis Stilloe is currently rented and used by Budget Fence Company. The Broome County Humane Society borders both Almy Brothers' parcels (west of Almy East and north of Almy West). This space is used to store rolls of wire fence and other fence materials.

There are two primary areas where this investigation was focused. One is an alleyway between the Almy East building and the 10 Jackson Street building. In April 1989, a release of liquid from one of the drums in the alleyway caused the NYSDEC to perform an emergency response clean-up of impacted soil adjacent to the drum. Subsequently, the NYSDEC listed this site as a Class 2, determining that a full remedial investigation/feasibility study was necessary to address residual contaminants at the site.

The other area of focus is a grassy area to the west and south of the Almy West building. A sprayer tank truck with the McMahon Bros., Inc., Weed and Pest Control logo on the door, is parked to the west of the Almy West building. It was suspected that contaminants may have washed off the truck or may be present due to past materials handling practices. Other areas of concern include the Budget Fence storage area in the Almy West building where drums were reportedly stored for a short time during 1988-1989, the Almy West building and the basement of the 10 Jackson Street building where contaminated soil may have washed in from the alleyway through a broken window.

2.2 SITE HISTORY

The site was originally occupied by a dairy processing facility. The buildings from the dairy operations have subsequently been used for a variety of businesses.

In the early 1980s the site was owned by Robert and Mary McMahon. Robert McMahon had previously held an interest in the McMahon Bros. pest control corporation; he sold his interest in that corporation to his son in the late 1970s. The company performed roadside herbicide application for local governments, as well as providing commercial pest control. Based on aerial photographs and current site conditions, it is believed that pesticides were stored on site, and other pesticide related activities may have occurred. Spray trucks or other application equipment may also have been washed or cleaned out at the site. There are no records of how or where these activities took place but it is suspected that they occurred in the areas in and around the site buildings.

The property was eventually subdivided and sold in parcels to Almy Brothers, Inc., Louis Stilloe and Mr. DeVincentis. In February 1989, Robert McMahon reportedly arranged with Almy to have Almy Brothers' employees move drums from the 10 Jackson Street building and place them in the alleyway against the Almy East building at 8 Jackson Street.

In April 1989, complaints of odors alerted the NYSDEC to a chemical spill emanating from the drums in the alleyway. Laboratory analysis of the spilled material showed the presence of the herbicides 2,4-D, 2,4,5-T and 2,4,5-TP (also known as Silvex). A spill response was conducted to overpack the drums in the alleyway and to excavate and contain soil and asphalt obviously impacted by the release of herbicides. The contents of the drums were analyzed to determine which drums contained herbicides; the results of this testing are in Appendix A. The 18 drums not containing Silvex were disposed of as part of the spill response action on March 14, 1991 and are no longer on site. The drums containing Silvex remained on site as there are no facilities currently available for the disposal of Silvex due to the possible presence of dioxin, a manufacturing process byproduct in much of the Silvex produced in this country. Seven overpacked drums of liquid and sludge containing Silvex and 2,4-D, and 74 drums of excavated soil and asphalt resulting from the spill response action are stored within the alleyway where access has been restricted by the installation of a chain-link fence. In August of 1990 the site was referred to the Division of Hazardous Waste Remediation for the implementation of a remedial program under the State Superfund.

2.3 SITE HYDROGEOLOGY

2.3.1 Regional Aquifer System

The Susquehanna River drains many of the productive aquifers in New York. These aquifers are composed mainly of sand and gravel interbedded with silt and clay in varying proportions, and are generally located adjacent to major streams and rivers. Specific to the

Johnson City/Binghamton area is the valley-fill aquifer defined by Holecek et. al., in the 1982 USGS Open-file Report 82-268. This aquifer and the surrounding drainage basin comprise the Clinton Street-Ballpark Sole Source Aquifer according to an April 1990 map provided by the USEPA Region 2 and is a NYS designated Primary aquifer according to the October 23, 1990 NYSDEC Division of Water Technical and Operational Guidance Series (2.1.3). The Almy Brothers Site is located within the defined limits of this valley-fill aquifer. One particularly productive portion of the valley-fill aquifer exists just over one mile west of the site where the Susquehanna River flows close to the southern end of its valley. This aquifer, called the Clinton Street-Ballpark Aquifer (Randall, 1977 and Waller and Finch, 1982), has a transmissivity of over 10,000 feet squared per day.

The principal sources of recharge to the Susquehanna River Valley aquifers are: recharge directly from the Susquehanna and Chenango Rivers; precipitation (average annual precipitation is 36.78 inches for Binghamton, NOAA, 1988) and, infiltration from small streams crossing the aquifer (Randall, Bulletin 73, 1977).

Groundwater has been the primary source of water for Johnson City and Endicott since 1912, when compressed air was first used to pump wells in the Village of Endicott. Since then, a number of well fields have developed on which the residential population and industry are very dependent. The City of Binghamton currently utilizes the Susquehanna River upstream of the site as its primary source of water.

A municipal well is located approximately 1,000 feet north-northeast of the Almy Brothers Site on the north side of the Susquehanna River. This well is not currently in use but serves as an emergency backup for the City of Binghamton. The well is approximately 120 feet deep and is constructed of a concrete caisson with horizontal radial drains extending into the formation. The well can yield an estimated 12 million gallons per day which is likely to produce a cone of influence extending under the river (Brink, Telecon 1993).

2.3.2 Site-Specific Groundwater Conditions

Based on grain size descriptions and the result of a hydraulic conductivity test performed at DGC-6D, the stratified drift deposits have the greatest potential for groundwater yield. Well DGC-6D is screened exclusively in the stratified drift and a hydraulic conductivity (K) test performed at this well resulted in a K-value of 1.56×10^{-2} cm/s. The shallow wells on the site are screened mainly in the flood-plain silt with perhaps a few feet in fill or in the stratified drift. Table 2.1 shows the results of hydraulic conductivity testing with the corresponding units screened for each well. Results in these wells ranged from 5.52×10^{-3} cm/s in DGC-2 to 4.57×10^{-5} cm/s in DGC-1. The higher K values tended to be associated with wells screened in more fill or stratified drift and lower K values were associated with wells screened in predominantly flood-plain silts.

Groundwater level contour maps were generated based on water levels collected on July 23, 1991 and September 16, 1992. According to these water levels, the flow direction across the site is to the northeast. The contour map representing the September 1992 data shows the groundwater flow direction at the north portion of the site trending to the west toward the Susquehanna River.

Given the close proximity of the site to the Susquehanna River, it is suspected that groundwater levels at the site are controlled in part by changes in the river level. Depending on the timing of precipitation events, the river may be recharging or draining the floodplain aquifer, driving local flow to the southeast or the northwest, respectively.

The groundwater levels and flow direction are also controlled by infiltration of precipitation through the ground surface. Unpaved soil, composed mainly of sand, silt and gravel, readily allows water to percolate down to the aquifer and eventually flows into the river. However, at the Almy Brothers Site, most of the ground surface is paved with the exception of the grassy area behind the Almy West building. It was observed during a rainfall event that much of the rain does not flow toward the storm sewers but drains toward the grassy area, ponding directly south of the Almy West building. This infiltration has caused localized mounding in the area of DGC-2 from which flow is apparently radiating to the north and northeast. This localized mounding effect is likely to be present at any location where pavement runoff drains to unpaved areas.

Review of a 1985 sanitary sewer map provided by the City of Binghamton shows the approximate elevation of the storm sewer, at the corner of Jackson and Moore Streets, to be 836.2 feet. The groundwater elevation in that area ranged from 832.2 feet to 833.6 feet from July 1991 to January 1992. This indicates that the storm sewer is above the water table and therefore, does not influence groundwater flow.

However, this sewer map shows the sanitary sewers to be located at an approximate elevation of 832.2 feet. This suggests the possibility of the sanitary sewer providing a localized influence on groundwater flow. Any localized effect would be limited to areas downgradient of the site, in the vicinity of the corner of Jackson and Moore Streets. The numbers and locations of monitoring wells is not sufficient to evaluate potential effects of the sewer systems on groundwater flow.

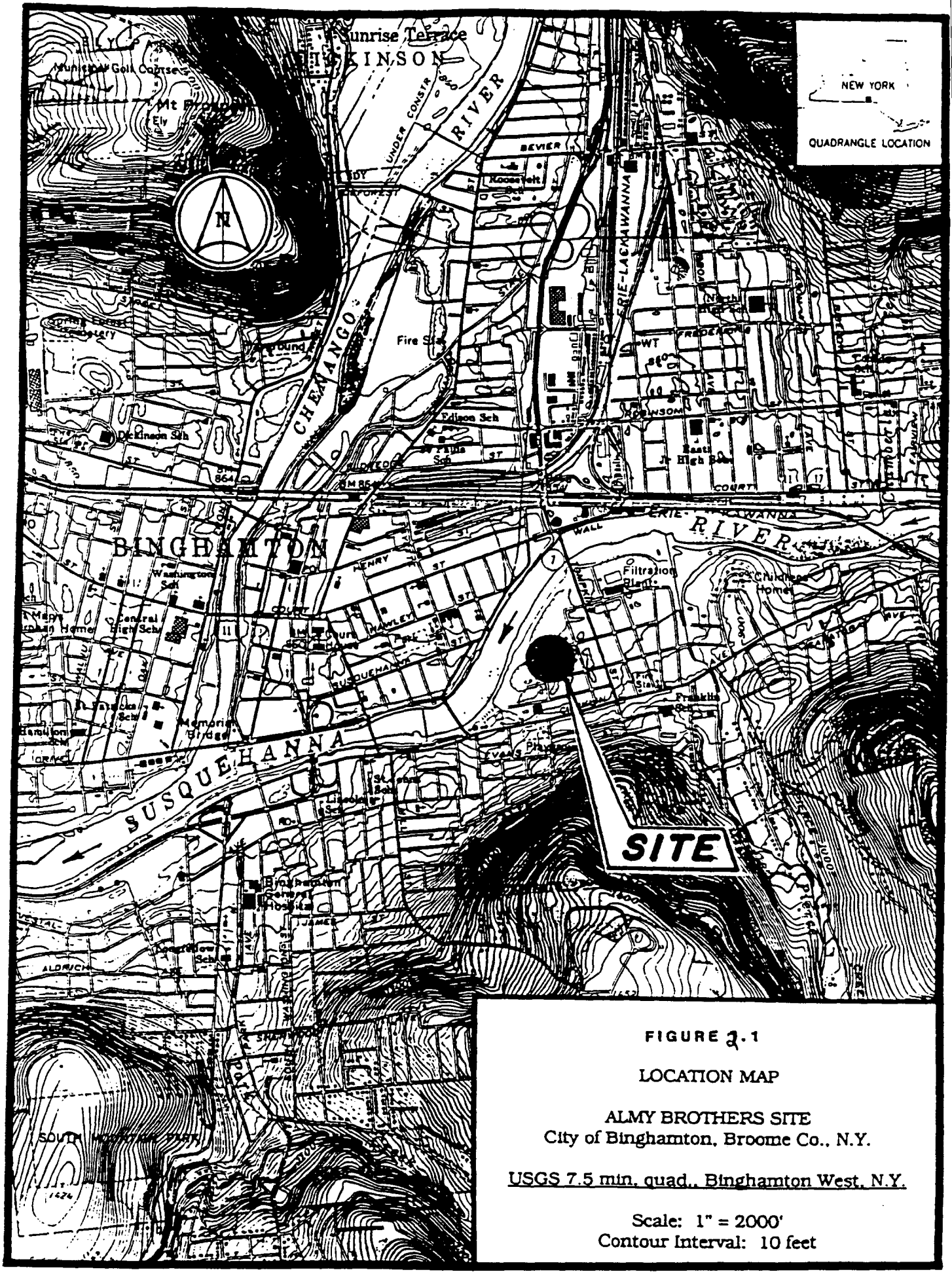


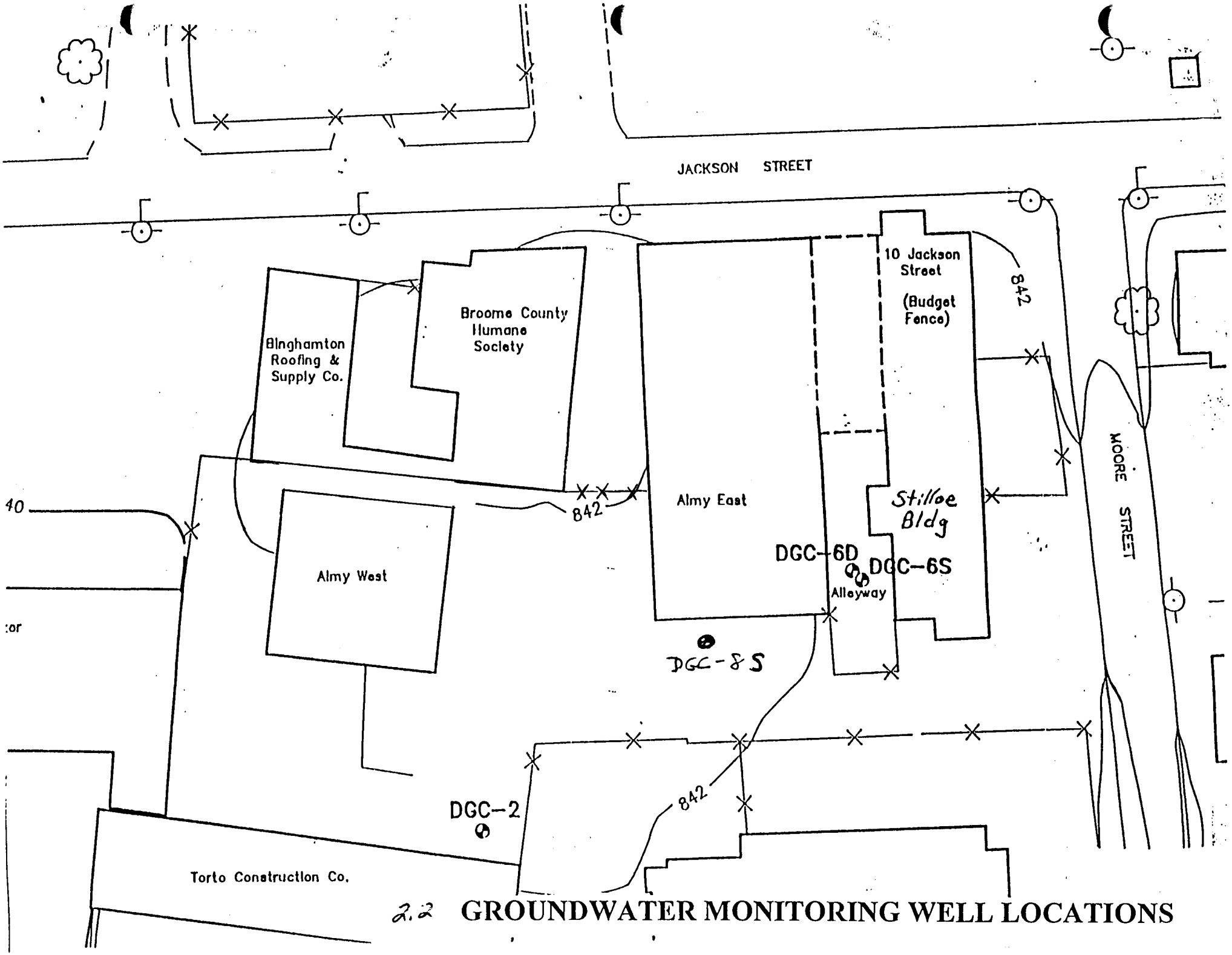
FIGURE 2.1

LOCATION MAP

ALMY BROTHERS SITE
City of Binghamton, Broome Co., N.Y.

USGS 7.5 min. quad., Binghamton West, N.Y.

Scale: 1" = 2000'
Contour Interval: 10 feet



2.2 **GROUNDWATER MONITORING WELL LOCATIONS**

3. SITE REMEDIAL ACTION

3.1 INTRODUCTION

In August 1990 the site was listed on the NYS Registry of Inactive Hazardous Waste Sites as a Class 2 site. A Remedial Investigation/Feasibility Study (RI/FS) was completed by the NYSDEC in December 1993. Based upon the results of the Remedial Investigation, it appears that pesticide and herbicide handling activities occurred in the areas in and around the site buildings. Herbicide and pesticide contamination exists in the soils, sediments, and groundwater on and adjacent to the site. A report entitled *Remedial Investigation Report, June 18, 1993* has been prepared describing the field activities and findings of the RI in detail.

(For the purpose of this document, pesticides are defined as the list of parameters on the Target Compound List for pesticides according to NYSDEC Contract Laboratory Protocol, Method 89-3. The term herbicides refers to the compounds 2,4-D, 2,4,5-T, and Silvex.)

A Feasibility Study was completed in December 1993 by the NYSDEC. A Record of Decision (ROD) was signed on March 28, 1994, which identifies the following remedy: treatment of the contaminated soils and sediments with the base-catalyzed decomposition process; and on-site decontamination followed by off-site disposal or recycling of the contaminated vehicles, underground storage tanks, and debris.

3.2 Remedial Action Description

3.2.1 Contract 1

In July of 1995, the Department hired AllState Power Vac (APV) to prepare the site for base-catalyzed decomposition (BCD) treatment of contaminated soils. APV was tasked to provide a water treatment system, decontaminate and dispose of miscellaneous contaminated debris, clean the large sump in the basement of 10 Jackson Street Building, scarify contaminated concrete floors, demolish structures to provide future access, remediate the storm sewer and excavate and stockpile contaminated soils from the staging area for the BCD treatment unit.

3.2.2 Contract 2

In March 1996, the Department hired ETG Environmental to excavate and treat contaminated soils using the base-catalyzed decomposition treatment process. The contract also included backfilling the treated soils, removing three underground storage tanks and their contents, and final site restoration. ETG also installed an additional well point in the former area of the underground storage tanks.

4. SAMPLING, ANALYSIS, AND DATA REPORTING

This section describes the environmental monitoring program for the Almy Brothers Site. The elements of the environmental monitoring plan are sampling, analyses, quality assurance/quality control (QA/QC), and data reporting for groundwater.

4.1 ENVIRONMENTAL SAMPLING PROCEDURES

Implementation of proper sampling procedures has a significant effect on the quality of the analytical data. Therefore, the samplers should be well-trained and familiar with sampling protocol. Sampling should be done in teams of two or more samplers. The minimum required experience and qualifications of samplers should include:

- Proper Occupational Safety and Health Act (OSHA) health and safety training and medical monitoring (29 CFR 1910.120);
- At least one of the team samplers should have one year of sampling experience.

The environmental sampling procedures provided below were developed based on site-specific information.

4.1.1 Groundwater Sampling Procedures

The initial groundwater monitoring network will consist of the four existing monitoring wells. Appendix A contains the boring logs for the monitoring wells. The groundwater monitoring network is intended to be dynamic, and a periodic (i.e., annual) evaluation should be made as to the usefulness of the data derived from the network. If it is determined that the water quality data from a well does not change significantly from one sampling event to another, that well could be considered for removal from the network. Evaluation of data is discussed in Section 4.3.

Groundwater samples will be collected and analyzed as detailed in Section 4.2. Sampling of the monitoring wells will consist of:

- Measurement of depth-to-water level and total depth of the well (to calculate well volume);
- Evacuation of static water (purging); and
- Sample collection.

These activities are described below:

4.1.1.1 Water Level Measurement and Well Volume Calculation

Water level measurements will be collected from each of the monitoring wells prior to purging and sampling. The measurements will be recorded using the following procedures:

- Record date, time, weather conditions, and any other well-specific pertinent information;
- Locate reference mark at the top of the well casing;
- Lower electronic water level indicator probe into well, making sure the cord attached to the probe does not scrape the sides of the well casing;
- When an audible signal is detected, stop lowering the probe;
- Raise the probe until the audible signal ceases;
- Lower probe slowly again, stopping as soon as an audible signal is detected;
- Hold cord to side of well casing where reference mark is etched;
- Record measurement (to the nearest 0.01 foot) as depth to water in field logbook.
- Repeat procedure three times for consistency; measurement should remain constant;
- Record the total depth of the well (to the nearest 0.01 foot) by lowering the probe to the bottom of the well and positioning the cord next to the reference mark on the well casing and measuring; and
- After completing both measurements at each well, decontaminate the probe to avoid any possible cross-contamination (see Section 4.1.5).

4.1.1.2 Purging

Before a groundwater sample is collected, the static water must be purged from the well to ensure that a representative groundwater sample is obtained. Three to five well volumes must be purged before collecting a sample.

Prior to sampling each well, bailers must be properly decontaminated to prevent contamination from previous sampling events (see Section 4.1.5). Water removed during purging should be disposed of as detailed in Section 5.3.3.

4.1.1.3 Sampling

Groundwater temperature, pH, specific conductance, and turbidity will be measured prior to sampling. Sampling will be performed as follows:

- Polyethylene sheeting (or similar covering) will be placed on the ground to avoid surface contamination, if necessary;
- To keep sample turbidity as low as possible, the order of collection for groundwater samples will be VOCs, semivolatiles, pesticides/herbicides, and then metals;
- For samples to be analyzed for VOC's, no headspace (or bubbles) will be left in the sample container; the samples will be handled as little as possible;
- When transferring water from the bottom loading bailer to sample containers, care will be taken to avoid agitating the sample because agitation promotes the loss of volatile constituents;
- Volatile samples must be collected within three hours of purge and all samples must be collected within 24 hour of purge.
- Observed physical characteristics (e.g., color, sheen, odor, clarity) of the groundwater at the time of sampling will be recorded qualitatively; and
- Weather conditions (i.e., air temperature, sky conditions, recent precipitation, drought conditions) at the time of sampling will be recorded.
- Sampling should not be conducted until the NTUs are below 50, and the temperature, pH and specific conductance have stabilized to within 10% for three consecutive readings.
- TAMS has the following recommendations for the sampling of the recently installed monitoring well at the Almy site.

  Evacuation - based on information from well development, evacuation of three well volumes (about 4.5 gallons) is probably feasible within a reasonable time frame (two hours or so). Evacuation should be done at a low rate; ideally not exceeding the recharge rate. In no case should the well be evacuated to dryness.

A low flow submersible pump is recommended; it has been noted that the use of bailers disturbs the formation and the turbidity objective of less than 50 NTU cannot be met.

Sampling - a low flow submersible pump is recommended. New teflon tubing should be used; the sample should not contact any materials other than teflon or stainless steel prior to the glass sample container. Sample containers should not be preserved. If new or dedicated teflon tubing was used for the evacuation, the same tubing may be used for sampling.

Analytical - based on the known/suspected contents of the removed tank (diesel or #2 fuel oil), the sample should be analyzed for volatile organic compounds (VOCs) by SW-846 method 8021 and for semivolatile organic compounds (SVOCs) by method 8270. Compounds to be reported should be consistent with those identified in STARS Memo #1; i.e., BTEX and benzene-related compounds for the VOC analysis, and PAHs (polynuclear aromatic hydrocarbons) for the 8270 analysis. Only the base/neutral fraction of the SVOC analysis need to be conducted. CAN USED METHOD 8260B

Required sample containers and volumes are presented in Table 4-1. Required sample preservation and holding times are presented in Table 4-2. Analyses will be performed on unfiltered samples. If turbidity is high, NYSDEC may require metals analyses on filtered and unfiltered samples.

4.1.2 Decontamination Procedures

Sampling methods and equipment should be chosen to minimize decontamination requirements and prevent the possibility of cross-contamination.

Sampling equipment, including bailers and stainless steel spoons, will be decontaminated by removal of foreign matter, followed by high-pressure steam cleaning, or by the following procedure when a steam cleaner is unavailable:

- Washing in a trisodium phosphate (TSP) solution;
- Rinsing with potable water;
- Rinsing with deionized water; and
- Air drying.

404C STARSLIST
No TICKS

Recommended Soil Cleanup Objectives for Fuel Oil Contaminated Soil

Contaminant	CAS Registry Number	Partition coefficient Koc	Recommended EPA Method	Groundwater Standards/ Criteria Cw ug/l or ppb.	Allowable Soil Concentration Cs[1] (ppm)	Soil Cleanup objectives to Protect GW Quality (ppm)	USEPA Health Based (HEAST) (ppm)		Detection Limit Solid (ppb)	Rec.soil Cleanup Objective (ppm)
							Carcinogens	Systemic Toxicants		
Benzene	71-43-2	83	8021/8260	0.7	0.0006	0.06	24	N/A	2	0.06 or MDL
Ethylbenzene	100-41-4	1,100	8021/8260	5	0.055	5.5	N/A	8,000	2	5.5
Toluene	108-88-3	300	8021/8260	5	0.015	1.5	N/A	20,000	2	1.5
Mixed Xylenes	N/A	240	8021/8260	5	0.012	1.2	N/A	200,000	2	1.2
Isopropylbenzene	98-82-8	454	8021/8260	5	0.023	2.3	N/A	3,100	1	2.3
n-Propylbenzene	103-65-1	741	8021/8260	5	0.037	3.7	N/A	N/A	1	3.7
p-Isopropyltoluene	99-87-6	2,114	8021/8260	5	0.11	11.0	N/A	N/A	1	10.0*
1,2,4 - Trimethylbenzene	95-63-6	2,590	8021/8260	5	0.13	13.0	N/A	N/A	1	10.0*
1,3,5 - Trimethylbenzene	108-67-8	661	8021/8260	5	0.033	3.3	N/A	N/A	1	3.3
n-Butyl-Benzene	104-51-8	2,455	8021/8260	5	0.12	12.0	N/A	N/A	1	10.0*
sec-Butyl-Benzene	135-98-8	2,200	8021/8260	5	0.11	11.0	N/A	N/A	1	10.0*
Tert-Butyl-Benzene	98-06-6	2,200	8021/8260	5	0.11	11.0	N/A	N/A	1	10.0*
Naphthalene	91-20-3	1,300	8021/8260/8270	10	0.13	13.0	N/A	300	1(330)	13.0
Anthracene	120-12-7	14,000	8270	50	7.00	700.0	N/A	20,000	330	50.0**
Acenaphthene	83-32-9	4,600	8270	20	0.92	92.0	N/A	5,000	330	50.0**
Acenaphthylene	208-96-8	2,056	8270	50	1.03	103.0	N/A	N/A	330	50.0**
Benz(a)anthracene	56-55-3	1,380,000	8270	0.002	0.028	2.8	0.224	N/A	330	0.224 or MDL
Benzo(b)fluoranthene	205-99-2	550,000	8270	0.002	0.011	1.1	0.220	N/A	330	0.220 or MDL
Benzo(k)fluoranthene	207-8-9	550,000	8270	0.002	0.011	1.1	0.220	N/A	330	0.220 or MDL
Benzo(g,h,i)perylene	191-24-2	1,600,000	8270	5	80.00	8,000.0	N/A	N/A	330	50.0**
Benzo(a)pyrene	50-32-8	5,500,000	8270	0.002	0.11	11.0	0.061	N/A	330	0.061 or MDL
Chrysene	218-01-9	200,000	8270	0.002	0.004	0.40	N/A	N/A	330	0.4
Dibenzo(a,h)anthracene	53-70-3	3,300,000	8270	50	1,650.00	165,000.0	0.0143	N/A	330	0.0143 or MDL
Fluoranthene	206-44-0	38,000	8270	50	19.00	1,900.0	N/A	3,000	330	50.0**
Fluorene	86-73-7	7,300	8270	50	3.65	365.0	N/A	3,000	330	50.0**
Indeno(1,2,3-cd)pyrene	193-39-5	1,600,000	8270	0.002	0.032	3.2	N/A	N/A	330	3.2
Phenanthrene	85-01-5	4,365	8270	50	2.18	218.0	N/A	N/A	330	50.0**
Pyrene	129-00-0	13,295	8270	50	6.65	665.0	N/A	2,000	330	50.0**

N/A- Not Applicable

MDL - Method Detection Limit

1 - Allowable concentration with no Dilution Attenuation Factor - see TAGM 4046

*As per TAGM 4046 individual and the sum of VOCs not listed (Tentatively Identified Compounds(TICs))≤ 10 ppm

**As per TAGM 4046 individual non-carcinogenic semivolatiles ≤ 50 ppm and total semivolatiles not listed (Tentatively Identified Compounds(TICs))≤ 500ppm

Note: Soil cleanup objectives are developed for soil organic carbon content (f) of 1%, and should be adjusted for the actual soil organic carbon if it is known.

METHOD 8260B
VOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/
MASS SPECTROMETRY (GC/MS)

1.0 SCOPE AND APPLICATION

1.1 Method 8260 is used to determine volatile organic compounds in a variety of solid waste matrices. This method is applicable to nearly all types of samples, regardless of water content, including various air sampling trapping media, ground and surface water, aqueous sludges, caustic liquors, acid liquors, waste solvents, oily wastes, mousses, tars, fibrous wastes, polymeric emulsions, filter cakes, spent carbons, spent catalysts, soils, and sediments. The following compounds can be determined by this method:

		Appropriate Preparation Technique[a]					
Compound	CAS No.[b]	5030/ 5035	5031	5032	5021	5041	Direct Inject.
Acetone	67-64-1	pp	c	c	nd	c	c
Acetonitrile	75-05-8	pp	c	nd	nd	nd	c
Acrolein (Propenal)	107-02-8	pp	c	c	nd	nd	c
Acrylonitrile	107-13-1	pp	c	c	nd	c	c
Allyl alcohol	107-18-6	ht	c	nd	nd	nd	c
Allyl chloride	107-05-1	c	nd	nd	nd	nd	c
Benzene	71-43-2	c	nd	c	c	c	c
Benzyl chloride	100-44-7	c	nd	nd	nd	nd	c
Bis(2-chloroethyl)sulfide	505-60-2	pp	nd	nd	nd	nd	c
Bromoacetone	598-31-2	pp	nd	nd	nd	nd	c
Bromochloromethane	74-97-5	c	nd	c	c	c	c
Bromodichloromethane	75-27-4	c	nd	c	c	c	c
4-Bromofluorobenzene (surr)	460-00-4	c	nd	c	c	c	c
Bromoform	75-25-2	c	nd	c	c	c	c
Bromomethane	74-83-9	c	nd	c	c	c	c
n-Butanol	71-36-3	ht	c	nd	nd	nd	c
2-Butanone (MEK)	78-93-3	pp	c	c	nd	nd	c
t-Butyl alcohol	75-65-0	pp	c	nd	nd	nd	c
Carbon disulfide	75-15-0	pp	nd	c	nd	c	c
Carbon tetrachloride	56-23-5	c	nd	c	c	c	c
Chloral hydrate	302-17-0	pp	nd	nd	nd	nd	c
Chlorobenzene	108-90-7	c	nd	c	c	c	c
Chlorobenzene-d_5 (IS)		c	nd	c	c	c	c
Chlorodibromomethane	124-48-1	c	nd	c	nd	c	c
Chloroethane	75-00-3	c	nd	c	c	c	c
2-Chloroethanol	107-07-3	pp	nd	nd	nd	nd	c
2-Chloroethyl vinyl ether	110-75-8	c	nd	c	nd	nd	c
Chloroform	67-66-3	c	nd	c	c	c	c
Chloromethane	74-87-3	c	nd	c	c	c	c
Chloroprene	126-99-8	c	nd	nd	nd	nd	c
3-Chloropropionitrile	542-76-7	l	nd	nd	nd	nd	pc

(continued)

Compound	CAS No.[b]	Appropriate Preparation Technique[a] 5030/ 5035	5031	5032	5021	5041	Direct Inject.
Crotonaldehyde	4170-30-3	pp	c	nd	nd	nd	c
1,2-Dibromo-3-chloropropane	96-12-8	pp	nd	nd	c	nd	c
1,2-Dibromoethane	106-93-4	c	nd	nd	c	nd	c
Dibromomethane	74-95-3	c	nd	c	c	c	c
1,2-Dichlorobenzene	95-50-1	c	nd	nd	c	nd	c
1,3-Dichlorobenzene	541-73-1	c	nd	nd	c	nd	c
1,4-Dichlorobenzene	106-46-7	c	nd	nd	c	nd	c
1,4-Dichlorobenzene-d_4 (IS)		c	nd	nd	c	nd	c
cis-1,4-Dichloro-2-butene	1476-11-5	c	nd	c	nd	nd	c
trans-1,4-Dichloro-2-butene	110-57-6	pp	nd	c	nd	nd	c
Dichlorodifluoromethane	75-71-8	c	nd	c	c	nd	c
1,1-Dichloroethane	75-34-3	c	nd	c	c	c	c
1,2-Dichloroethane	107-06-2	c	nd	c	c	c	c
1,2-Dichloroethane-d_4 (surr)		c	nd	c	c	c	c
1,1-Dichloroethene	75-35-4	c	nd	c	c	c	c
trans-1,2-Dichloroethene	156-60-5	c	nd	c	c	c	c
1,2-Dichloropropane	78-87-5	c	nd	c	c	c	c
1,3-Dichloro-2-propanol	96-23-1	pp	nd	nd	nd	nd	c
cis-1,3-Dichloropropene	10061-01-5	c	nd	c	nd	c	c
trans-1,3-Dichloropropene	10061-02-6	c	nd	c	nd	c	c
1,2,3,4-Diepoxybutane	1464-53-5	c	nd	nd	nd	nd	c
Diethyl ether	60-29-7	c	nd	nd	nd	nd	c
1,4-Difluorobenzene (IS)	540-36-3	nd	nd	nd	nd	c	nd
1,4-Dioxane	123-91-1	pp	c	c	nd	nd	c
Epichlorohydrin	106-89-8	l	nd	nd	nd	nd	c
Ethanol	64-17-5	l	c	c	nd	nd	c
Ethyl acetate	141-78-6	l	c	nd	nd	nd	c
Ethylbenzene	100-41-4	c	nd	c	c	c	c
Ethylene oxide	75-21-8	pp	c	nd	nd	nd	c
Ethyl methacrylate	97-63-2	c	nd	c	nd	nd	c
Fluorobenzene (IS)	462-06-6	c	nd	nd	nd	nd	nd
Hexachlorobutadiene	87-68-3	c	nd	nd	c	nd	c
Hexachloroethane	67-72-1	l	nd	nd	nd	nd	c
2-Hexanone	591-78-6	pp	nd	c	nd	nd	c
2-Hydroxypropionitrile	78-97-7	l	nd	nd	nd	nd	pc
Iodomethane	74-88-4	c	nd	c	nd	c	c
Isobutyl alcohol	78-83-1	pp	c	nd	nd	nd	c
Isopropylbenzene	98-82-8	c	nd	nd	c	nd	c
Malononitrile	109-77-3	pp	nd	nd	nd	nd	c
Methacrylonitrile	126-98-7	pp	l	nd	nd	nd	c
Methanol	67-56-1	l	c	nd	nd	nd	c
Methylene chloride	75-09-2	c	nd	c	c	c	c
Methyl methacrylate	80-62-6	c	nd	nd	nd	nd	c
4-Methyl-2-pentanone (MIBK)	108-10-1	pp	c	c	nd	nd	c
Naphthalene	91-20-3	c	nd	nd	c	nd	c

(continued)

Compound	CAS No.[b]	Appropriate Preparation Technique[a] 5030/ 5035	5031	5032	5021	5041	Direct Inject.
Nitrobenzene	98-95-3	c	nd	nd	nd	nd	c
2-Nitropropane	79-46-9	c	nd	nd	nd	nd	c
N-Nitroso-di-n-butylamine	924-16-3	pp	c	nd	nd	nd	c
Paraldehyde	123-63-7	pp	c	nd	nd	nd	c
Pentachloroethane	76-01-7	I	nd	nd	nd	nd	c
2-Pentanone	107-87-9	pp	c	nd	nd	nd	c
2-Picoline	109-06-8	pp	c	nd	nd	nd	c
1-Propanol	71-23-8	pp	c	nd	nd	nd	c
2-Propanol	67-63-0	pp	c	nd	nd	nd	c
Propargyl alcohol	107-19-7	pp	I	nd	nd	nd	c
β-Propiolactone	57-57-8	pp	nd	nd	nd	nd	c
Propionitrile (ethyl cyanide)	107-12-0	ht	c	nd	nd	nd	pc
n-Propylamine	107-10-8	c	nd	nd	nd	nd	c
Pyridine	110-86-1	I	c	nd	nd	nd	c
Styrene	100-42-5	c	nd	c	c	c	c
1,1,1,2-Tetrachloroethane	630-20-6	c	nd	nd	c	c	c
1,1,2,2-Tetrachloroethane	79-34-5	c	nd	c	c	c	c
Tetrachloroethene	127-18-4	c	nd	c	c	c	c
Toluene	108-88-3	c	nd	c	c	c	c
Toluene-d_8 (surr)	2037-26-5	c	nd	c	c	c	c
o-Toluidine	95-53-4	pp	c	nd	nd	nd	c
1,2,4-Trichlorobenzene	120-82-1	c	nd	nd	c	nd	c
1,1,1-Trichloroethane	71-55-6	c	nd	c	c	c	c
1,1,2-Trichloroethane	79-00-5	c	nd	c	c	c	c
Trichloroethene	79-01-6	c	nd	c	c	c	c
Trichlorofluoromethane	75-69-4	c	nd	c	c	c	c
1,2,3-Trichloropropane	96-18-4	c	nd	c	c	c	c
Vinyl acetate	108-05-4	c	nd	c	nd	nd	c
Vinyl chloride	75-01-4	c	nd	c	c	c	c
o-Xylene	95-47-6	c	nd	c	c	c	c
m-Xylene	108-38-3	c	nd	c	c	c	c
p-Xylene	106-42-3	c	nd	c	c	c	c

[a] See Sec. 1.2 for other appropriate sample preparation techniques
[b] Chemical Abstract Service Registry Number

c = Adequate response by this technique
ht = Method analyte only when purged at 80°C
nd = Not determined
I = Inappropriate technique for this analyte
pc = Poor chromatographic behavior
pp = Poor purging efficiency resulting in high Estimated Quantitation Limits
surr = Surrogate
IS = Internal Standard

1.2 There are various techniques by which these compounds may be introduced into the GC/MS system. The more common techniques are listed in the table above. Purge-and-trap, by Methods 5030 (aqueous samples) and 5035 (solid and waste oil samples), is the most commonly used technique for volatile organic analytes. However, other techniques are also appropriate and necessary for some analytes. These include direct injection following dilution with hexadecane (Method 3585) for waste oil samples; automated static headspace by Method 5021 for solid samples; direct injection of an aqueous sample (concentration permitting) or injection of a sample concentrated by azeotropic distillation (Method 5031); and closed system vacuum distillation (Method 5032) for aqueous, solid, oil and tissue samples. For air samples, Method 5041 provides methodology for desorbing volatile organics from trapping media (Methods 0010, 0030, and 0031). In addition, direct analysis utilizing a sample loop is used for sub-sampling from Tedlar® bags (Method 0040). Method 5000 provides more general information on the selection of the appropriate introduction method.

1.3 Method 8260 can be used to quantitate most volatile organic compounds that have boiling points below 200°C. Volatile, water soluble compounds can be included in this analytical technique by the use of azeotropic distillation or closed-system vacuum distillation. Such compounds include low molecular weight halogenated hydrocarbons, aromatics, ketones, nitriles, acetates, acrylates, ethers, and sulfides. See Tables 1 and 2 for analytes and retention times that have been evaluated on a purge-and-trap GC/MS system. Also, the method detection limits for 25-mL sample volumes are presented. The following compounds are also amenable to analysis by Method 8260:

Bromobenzene
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Chloroacetonitrile
1-Chlorobutane
1-Chlorohexane
2-Chlorotoluene
4-Chlorotoluene
Dibromofluoromethane
cis-1,2-Dichloroethene
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
p-Isopropyltoluene
Methyl acrylate
Methyl-t-butyl ether
Pentafluorobenzene
n-Propylbenzene
1,2,3-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene

1.4 The estimated quantitation limit (EQL) of Method 8260 for an individual compound is somewhat instrument dependent and also dependent on the choice of sample preparation/introduction method. Using standard quadrapole instrumentation and the purge-and-trap technique, limits should be approximately 5 µg/kg (wet weight) for soil/sediment samples, 0.5 mg/kg (wet weight) for wastes, and 5 µg/L for ground water (see Table 3). Somewhat lower limits may be achieved using an ion trap mass spectrometer or other instrumentation of improved design. No matter which instrument is used, EQLs will be proportionately higher for sample extracts and samples that require dilution or when a reduced sample size is used to avoid saturation of the detector.

1.5 This method is restricted to use by, or under the supervision of, analysts experienced in the use of gas chromatograph/mass spectrometers, and skilled in the interpretation of mass spectra and their use as a quantitative tool.

4.1.3 Sample Custody

This section describes procedures for sample chain-of-custody to be followed by sampling personnel. The purpose of these procedures is to ensure that the integrity of the samples is maintained during their collection and transportation. All chain-of-custody requirements comply with EPA-recommended sample-handling protocol for the Contract Laboratory Program (CLP) program.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include field notebooks, field sample maps, sample labels, custody seals, and chain-of-custody records. Examples of the custody forms are given in Figures 4-1 and 4-2.

The primary objective of the chain-of-custody procedures is to provide an accurate written record that can be used to trace the possession and handling of a sample from the moment of its collection through its analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

Field Custody Procedures

- Sample bottles must be obtained precleaned from the analytical laboratory or directly from a retail source. Coolers or boxes containing cleaned bottles should be sealed with a custody seal during transport to the field or while in storage prior to use.
- As few persons as possible should handle samples.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in the field notebook.

Sample Tags and Labels

Sample tags and labels attached to or affixed around the sample container must be used to properly identify all samples taken in the field. The sample tags and labels are to be placed on the bottles so as not to obscure any quality assurance/quality control (QA/QC) data on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook (i.e., the sample label on the jar must agree with the description of the sample in the logbook). For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as real samples.

Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. A custody seal is placed over the cap of individual sample bottles by the sampling technician. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. Strapping tape should be placed around the lid to ensure that seals are not accidentally broken during shipment and in a manner that allows easy removal by laboratory personnel. On receipt at the laboratory, the custodian must check (and certify) that seals on boxes and bottles are intact.

Chain-of-Custody Record

The chain-of-custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory, the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the custody record.

Transfer of Custody and Shipment Procedures

- The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the record. This record documents sample custody transfer.

- Samples must be dispatched to the analytical laboratory for analysis with a separate chain-of-custody record accompanying each shipment. Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered in the "Remarks" section of the chain-of-custody record.

- All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment, and one copy is retained by the sampling team leader.

- If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, Postal Service receipts, and bills of lading are retained as part of the permanent documentation. Air bill numbers for express mail service must be written on chain-of-custody forms and in the field logbook.

- Samples must be shipped to the analytical laboratory within 24 to 48 hours from the time of collection.

4.2 ANALYTICAL PROGRAM

4.2.1 Analytical Methods and Sampling Intervals

Groundwater

Initially (after the remedy is substantially completed), all four wells will be sampled and analyzed for baseline TAL metals and Target Compound List (TCL) volatiles, semi-volatiles and pesticides. Additionally, samples will be analyzed by Method 8150 for herbicides. Subsequent monitoring will be conducted quarterly for the remainder of the first year.

After the first year of sample results are collected, the frequency of sampling, analytical parameters, and wells to be sampled should be reviewed and adjusted if necessary (see Section 4.3).

4.2.2 QA/QC Samples

Various types of field QC samples are used to check the cleanliness and effectiveness of field handling methods. Field QC samples provide quantitative and qualitative measures of precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination and document overall sampling and analytical precision. Field staff may add field blanks or duplicates if field circumstances are such that they consider normal procedures insufficient to prevent or control sample contamination or at the direction of NYSDEC. Detailed documentation of all field QC samples in the site logbooks is mandatory.

Field QC samples and the frequency of analysis for this project are summarized in Table 4-3 and briefly described below.

- **Trip Blanks** are blank samples that assess possible volatile organic contamination from transport conditions. Trip blanks are prepared at the laboratory prior to the sampling event and shipped with the sample bottles. Trip blanks are prepared by adding organic-free water to a 40-ml VOA vial. One trip blank will be used with every batch of water samples shipped for volatile organic analysis. Each trip blank will be transported to the sampling location, handled like a sample, and returned to the laboratory for analysis without being opened in the field.

- **Field Equipment/Rinsate Blanks** are blank samples designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use and that cleaning procedures between samples are sufficient to minimize cross-contamination. Rinsate blanks are prepared by passing analyte-free water over sampling equipment and analyzing the samples for all applicable parameters. If a sampling team is familiar with a particular site, its members may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

- **Field Duplicates** consist of a set of two samples collected independently at a sampling location during a single sampling event. Field duplicates can be sent to the laboratory so that they are indistinguishable from other analytical samples and personnel performing the analyses are not able to determine which samples are field duplicates. Field duplicates are designed to assess the consistency of the overall sampling and analytical system.

4.2.3 Laboratory Qualification

The analytical laboratory to be used for the analyses must maintain NYSDOH Environmental Laboratory Approval Program (ELAP) certification for all subcategories of solid and hazardous waste including NYSDEC Analytical Services Protocol (ASP) Contract Laboratory Program (CLP) metals. The ELAP quality assurance objectives should be met for all analyses.

4.2.4 Data Reporting and Record Keeping

All environmental monitoring results must be reported to NYSDEC within 90 days of the conclusion of sample collection, unless more rapid reporting is required to address an imminent environmental or public health concern. Reporting must include:

- Groundwater Sampling Log Sheet (Figure 4-3) which is to be used during groundwater sampling events.

- Analytical results table with date of sample collection, analytical result, sample point designation, applicable water quality standards, method detection limits (MDLs), and Chemical Abstract Service (CAS) numbers for all parameters analyzed;

- Tables or graphical representations comparing current analytical results with past results and upgradient results;

- A graphic interpretation regarding groundwater flow based on water level measurements using 11- by 17- inch scaled site maps;

- A summary of contraventions of water quality standards and/or significant increases in concentrations above existing water quality standards;

- Discussion of results and proposed modifications to the analytical schedules; and

- QA/QC documentation and data quality assessment report.

A separate annual report must also be submitted. This report must contain a summary of environmental quality information as stated above with special note of any changes in quality that occurred during the year. An annual evaluation of data usability and recommendations to NYSDEC/NYSDOH regarding modifications to this O&M Manual should be included. Reports should be sent to:

Gerald Rider, P.E.
Chief, Operation and Maintenance Section
Bureau of Hazardous Site Control
Department of Environmental Remediation
NYSDEC
50 Wolf Road
Albany, New York 12233-7010

Charles Branagh, P.E.
RHWE
NYSDEC - Region 7
615 Erie Boulevard West
Syracuse, New York 13204-2400

Gary Robinson
Public Health Specialist
NYSDOH
217 South Salina Street
Syracuse, New York 13202

Field activities should be documented in a field sampling logbook, a copy of which should also be submitted with the reports.

4.3 EVALUATION OF MONITORING REPORTS

The four wells that make up the groundwater monitoring network, and the analyses of samples from these points will provide comprehensive data about the quality of the groundwater at the Almy Brothers Site. After the first-year sampling data have been received, NYSDEC and NYSDOH should perform an evaluation of the usefulness of the data derived from the sample points. This evaluation should review the data with regard to sampling frequency, analysis performed, and sample location. If it is apparent that an analyte or group of analytes consistently meets the cleanup goals (groundwater standards), then these analytes should no longer be analyzed for. If it is determined that the data from a point do not change significantly from one sampling event to another, and if the data meets the cleanup goals, that point could be considered for removal the list of sample points.

Evaluation of metal results shall specifically include a review of sodium results, since sodium bicarbonate was the base catalyst utilized by ETG Environmental in the treatment process.

NYSDEC and NYSDOH should make a determination from the data to either continue sampling at the same or a different frequency. An annual evaluation of the data should be conducted as described above.

As we remove monitoring wells from the monitoring network, we should properly decommission them following the NYSDEC Groundwater Monitoring Well Decommissioning Procedures, October 1996.

TABLE 4-1

SAMPLE CONTAINERS AND VOLUMES FOR WATER SAMPLES

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)
Purgeable (Volatile) Organics	40-ml glass vial with Teflon-backed septum	Two; fill completely, no air space
Extractable Organics, Pesticides/PCBs	1/2 gallon bottles with Teflon-lined caps	Two; fill completely
Metals[a]	1-liter polyethylene bottle with polyethylene-lined cap	One; fill 7/8 full

Note: When project-specific laboratory QC samples are required for every 20 samples per matrix per week, a double volume of the sample should be collected and labeled as the matrix spike/matrix spike duplicate.

[a]Hardness sample is taken from metals container.

TABLE 4-2

SAMPLE PRESERVATION AND HOLDING TIMES FOR SOIL AND WATER SAMPLES

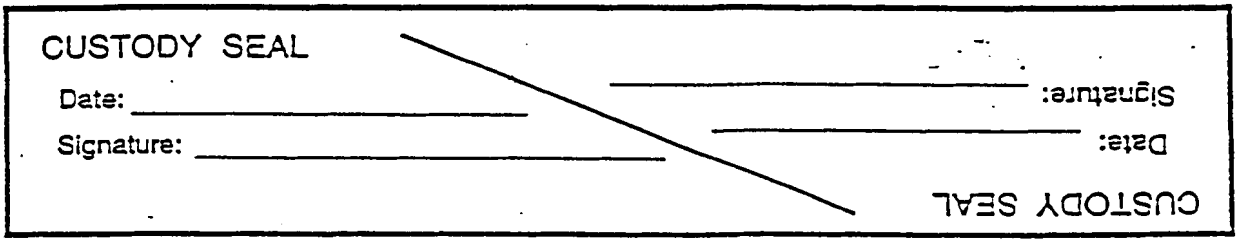
Parmeter	Preservative	Maximum Holding Time[a]	
		Soil	Water
Volatiles	Cool to 4° C	7 days	7 days
PCBs/Pesticides	Cool to 4° C	Extract within 5 days, analyze within 40 days	Extract within 5 days, analyze within 40 days
Extractable organics	Cool to 4° C	Extract within 5 days, analyze within 40 days	Extract within 5 days, analyze within 40 days
Metals	HNO_3 to pH<, cool to 4° C	- 6 months	6 months -

[a]Holding times are based on verified time of sample receipt (VTSR).

TABLE 4-3 FIELD QC SAMPLES	
Ground and Surface Water and Leachate	
Field duplicate	One/matrix/20 samples (for each analysis)
Trip blank	One/day/water matrix (for volatiles only)
Rinsate blank[a]	One/matrix/20 samples or per sampling event (for each analysis)
Sediments	
Field duplicate	One/matrix/20 samples (for each analysis)

Note: Aqueous blanks shipped with solid samples will be analyzed as water without quality control. Blanks will not be labeled as "solids".

[a]Rinsate blanks are required only for groundwaters where bailers are being decontaminated between samples.



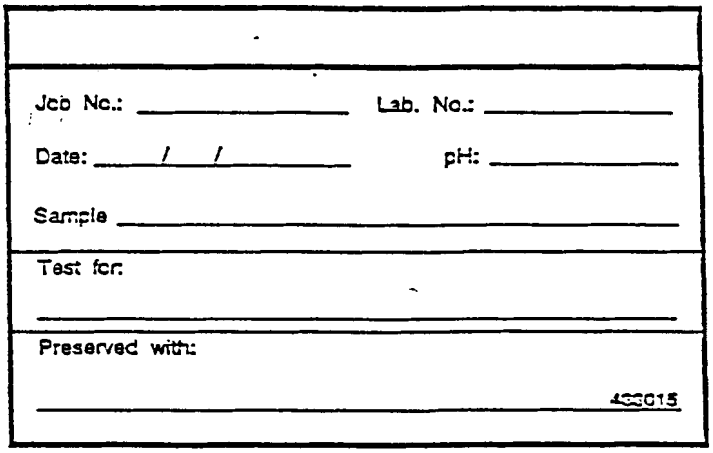


FIGURE 4-1 **SAMPLE CUSTODY SEAL/LABEL**

CHAIN-OF-CUSTODY

Page _____ of _____

Project No.:	Project Name:	Project Manager:
Samplers: (Signatures)		Field Team Leader:

STATION NUMBER	DATE	TIME	SAMPLE TYPE			SAMPLE INFORMATION	STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
			COMP	GRAB	AIR	EXPECTED COMPOUNDS			

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Ship Via	
Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Relinquished By: (Signature)	Date/Time	Received By: (Signature)	BL/Airbill Number:	Date
Relinquished By: (Signature)	Date/Time	Received for Laboratory By: (Signature)	Relinquished By: (Signature)	Date/Time	Received for Laboratory By: (Signature)		

Distribution: Original Accompanies Shipment: Copy to Coordinator Field Files
*See CONCENTRATION RANGE on back of form.

Figure 4-2 SAMPLE CHAIN-OF-CUSTODY RECORD

QAPP\3079_CC.PM5

APPENDIX
Almy Brothers Site #7-04-021
GROUNDWATER SAMPLING LOG SHEET

PAGE _____ OF _____

DATE

SAMPLE LOCATION ID

LOCATION ACTIVITY START END

FIELD QC DATA: ☐ FIELD DUPLICATE COLLECTED DUP ID _____

WATER LEVEL / WELL DATA

WELL DEPTH FT ☐ MEASURED ☐ HISTORICAL ☐ TOP OF WELL ☐ TOP OF CASING ☐ _____

PROTECTIVE CASING STICK-UP (FROM GROUND) FT

PROTECTIVE CASING/WELL DIFF. FT

WELL DIA. ☐ 2 INCH ☐ 4 INCH ☐ 6 INCH ☐ _____

WELL INTEGRITY:	YES	NO	N/A
PROT. CASING SECURE	☐	☐	☐
CONCRETE COLLAR INTACT	☐	☐	☐
WELL LOCKED	☐	☐	☐
OTHER: _____	☐	☐	☐

DEPTH TO WATER . FT

HISTORICAL WELL DEPTH FT

WELL MATERIAL: ☐ PVC ☐ SS ☐ _____

HEIGHT OF WATER COLUMN FT X ☐ .16 GAL/FT (2 IN) ☐ .65 GAL/FT (4 IN) ☐ 1.5 GAL/FT (6 IN) ☐ ___ GAL/FT (__IN) =

GAL/VOL

TOTAL GAL PURGED

AMBIENT AIR VOA PPM

WELL MOUTH PPM

PURGE DATA

PURGE VOLUME	@ ____ GAL	@ ____ GAL	@ ____ GAL	@ ____ GAL	@ ____ GAL
TEMP, DEG C					
pH, UNITS					
SPECIFIC CONDUCTIVITY umhos/cm					
_____					

SAMPLE OBSERVATIONS
☐ CLEAR
☐ COLORED _____
☐ CLOUDY _____
☐ TURBID _____
☐ ODOR _____
☐ OTHER (SEE NOTES)

EQUIPMENT DOCUMENTATION

PURGING	SAMPLING	
☐	☐	PERISTALTIC PUMP
☐	☐	SUBMERSIBLE PUMP
☐	☐	BAILER
☐	☐	PVC/SILICON TUBING
☐	☐	TEFLON/SILICON TUBING
☐	☐	AIR LIFT
☐	☐	WATERRA
	☐	IN-LINE FILTER
	☐	PRESS/VAC FILTER
☐		_____

EQUIPMENT ID
ISCO # _____
KECK # _____
☐ 2" ☐ 1" # ___
☐ QED
_____

DECON FLUIDS USED
☐ LIQUI-NOX
☐ DEIONIZED WATER
☐ HNO3/D.I. WATER
☐ POTABLE WATER
☐ TSP SOLUTION
☐ NONE
☐ _____

WATER LEVEL EQUIP. USED
☐ ELECTRIC COND. PROBE
☐ FLOAT ACTIVATED
☐ KECK INTERFACE PROBE
☐ OTHER

NUMBER OF FILTERS USED _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	
☐					☐	

NOTES

SIGNATURE: _____

Figure 4-3

5. SITE MAINTENANCE

Recommended inspection and maintenance items and actions are presented in this section for the Almy Brothers Site.

5.1 INSPECTION AND MAINTENANCE

The Almy Brothers Site should be inspected every sampling event and the Inspection Report Form (at the end of this section) properly completed. These inspections should determine the overall condition of the site and note any changes in use of the property. Routine maintenance should also be completed during these inspections. A summary report should also be prepared describing the results of the inspection and sampling. The documentation of the inspections and the summary report are discussed in Section 5.2.

5.1.1 Groundwater Monitoring System

Purpose

The groundwater monitoring system consists of four wells. The purpose of this system is to provide points at which the groundwater characteristics can be determined.

Determination of groundwater characteristics is discussed in Section 4.

Inspection and Maintenance

Inspection of the groundwater monitoring system should focus on the following areas:

- Caps;
- Locks;
- Surface seals/pads;
- Markings.

Recommended maintenance actions for these areas are presented in Table 5-1.

5.2 INSPECTION AND MAINTENANCE

Routine inspection and maintenance of the groundwater monitoring system should include a check of the conduct of caps, locks, surface soils and markings, along with lubrication of the locking mechanisms. Photo documentation is recommended to augment the inspection and maintenance checklist. The site inspector should have the following items for inspection:

- Appropriate health and safety equipment;
- Flashlight;
- Keys for all locks;
- Lock lubricant;
- Survey tape (50- or 100-foot);
- Camera; and
- Logbook.

This checklist should be used to conduct and record maintenance items and inspection results. Completed checklists and brief site visit report should be distributed as described in this plan.

Each year, a summary report should be prepared, which includes the following:

- Brief overview;
- Results of inspections during the year;
- Maintenance actions completed;
- Monitoring events completed;
- Results of monitoring and sampling;
- Detailed information on quantity and final disposal of wastes generated;
- Discussion of significant events (i.e., emergencies, severe weather) and observed effect on the site; and
- Summary and recommendations.

5.3 DISPOSAL OF WASTES

5.3.1 Monitoring/Sampling-Derived Waste

Well purge water and liquid decontamination wastes may be disposed of on-site due to the low level of contaminants expected at the site. All expendable materials (e.g., Tyvek, gloves, etc.) generated during sampling should be bagged and disposed off site as solid waste.

TABLE 5-1

GROUNDWATER MONITORING SYSTEM MAINTENANCE ITEMS
ALMY BROTHERS SITE
NYSDEC SITE NO. 7-04-021

Inspection Area	Item Noted	Action	Preventive Maintenance
1. Caps	a. Cracked or broken	• Replace.	• Check during sampling
2. Locks	a. Will not open b. Rusted c. Different key for each well	• Break open and replace. • Replace with the same lock number.	• Lubricate during sampling
3. Surface seals	a. Cracked	• Re-grout.	• Inspect during sampling
4. Markings	a. None b. Mislabeled	• Remark.	
5. Water Level (semiannually)	a. Dry b. Silted in or blocked	• DEC/DOH to determine if redrilling to a greater depth is warranted. • DEC/DOH to determine if redrilling is warranted. • Abandon in-place and/or install new well.	• Check during sampling

DATE _____

ALMY BROTHERS SITE #7-04-021
INSPECTION REPORT FORM

OVERALL SITE

Fence/Gate Condition	GOOD	FAIR	POOR	LOCKED?
Drainage Problems	Yes	No		
Evidence of Trespass	Yes	No		

Note any changes in use of the property

Groundwater Monitoring System Inspection Area	Item Noted	Action	Preventive Maintenance
1. Caps Well____	a. Cracked or broken	● Replace.	● Check during sampling
2. Locks Well____ Well____ Well____	a. Will not open b. Rusted c. Different key for each well	● Break open and replace. ● Replace with the same lock number.	● Lubricate during sampling
3. Surface seals	a. Cracked	● Re-grout.	● Inspect during sampling
4. Markings	a. None b. Mislabeled	● Remark.	
5. Water Level (semiannually)	a. Dry b. Silted in or blocked Well DGC-2 Well DGC-6S Well DGC-6D Well DGC-8S	● DEC/DOH to determine if redrilling to a greater depth is warranted. ● DEC/DOH to determine if redrilling is warranted. ● Abandon in-place and/or install new well.	● Check during sampling

Inspector_____

6.0 HEALTH AND SAFETY

6.1 Summary

6.1.1 EMERGENCY CONTACTS

Fire Department	911
Police Department	607-775-1241
NYSDEC - Region 7, Kirkwood Office	607-775-2545
NYSDEC - Albany Office	518-457-0927
NYSDOH - Albany Office	1-800-458-1158 or 518-458-6309
Broome County Department of Health	607-778-2887

6.1.2 EMERGENCY PROCEDURES

Emergency procedures are described in Section 6.5.2.

6.1.3 SITE SPECIFIC HAZARDS AND TRAINING

Site Specific Hazards are described in Paragraph 6.2. The primary contaminants on the site are pesticides and herbicides.

For each sampling event, a Field Team Leader and Site Safety Officer should be designated. The Site Safety Officer will be responsible for providing site-specific training to all personnel that work at the site. This training will cover the following topics:

- Names of personnel responsible for site safety and health.
- Safety, health, and other hazards at the site.
- Proper use of personal protective equipment.
- Work practices by which the employee can minimize risk from hazards.
- Acute health effects of compounds at the site.
- Decontamination procedures.

GENERAL HEALTH AND SAFETY REQUIREMENTS

Personnel Protective Equipment

Level D protection will be worn for initial entry on-site and for all activities. Level D protection will consist of:

- Standard work clothes
- Steel-toe safety boots
- Safety glasses or goggles must be worn when splash hazard is present
- Nitrile outer gloves and PVC inner gloves must be worn during all sampling activities
- Hard hat (must be worn during all sampling activities)

AIR MONITORING

No air monitoring will be required during the sampling activities.

6.2 RISK ASSESSMENT

6.2.1 CHEMICAL HAZARDS

The chemical hazards associated with the site is presented in Appendix C.

6.2.2 RADIATION HAZARDS

No radiation hazards are known at the sites included in this project.

6.2.3 PHYSICAL HAZARDS

6.2.3.1 EXPLOSION

No explosive hazards are known to exist at this site.

6.2.3.2 HEAT STRESS

The use of protective equipment may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 70°F or above. Table 6.2.1 presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) Index from American Conference of Governmental Industrial Hygienist (ACGIH) TLV Booklet can be used.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.
- If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third.
- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

- If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

- If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.

- Do not permit a worker to wear a semipermeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

- Prevention of Heat Stress - Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken.

- Adjust work schedules.

- Modify work/rest schedules according to monitoring requirements. Mandate work slowdowns as needed.

- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.

- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.d., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

- Maintain water temperature 50° to 60° F (10° to 16.6°C).

- Provide small disposal cups that hold about four ounces (0.1 liter).

- Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.

- Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat related illness.

6.2.3.3 COLD-RELATED ILLNESS

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite.

Hypothermia - Hypothermia is defined as a decrease in the patient core temperature below 96° F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interferences with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite - Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20°F. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of Cold-Related Illness - To prevent cold-related illness: Educate workers to recognize the symptoms of frostbite and hypothermia and identify and limit known risk factors: Assure the availability of an enclosed, heated environment on or adjacent to the site.

Assure availability of dry changes of clothing. Assure the availability of warm drinks.

Start (oral) temperature recording at the job site:

- At the Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status.

- At a worker's request.

- As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20°F, or wind-chill less than 30°F with precipitation).

- As a screening measure whenever any one worker on the site develops hypothermia.

- Any person developing moderate hypothermia (a core temperature of 92°F) cannot return to work for 48 hours.

TABLE 6.2.1

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING
FOR FIT AND ACCLIMATIZED WORK AREAS

Adjusted Temperature[b]	Normal Work[c] Ensemble	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5-90°F (30.8-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5-87.5°F (28.1-30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5-82.5°F (25.3-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5-77.5°F (22.5-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

---

a For work levels of 250 kilocalories/hour.

b Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to prevent a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

6.3 PERSONNEL PROTECTION AND MONITORING

6.3.1 MEDICAL SURVEILLANCE

Personnel involved in this operation must have undergone medical surveillance. Exams are to be conducted at 12-month intervals. The 12-month medical examination includes a complete medical and work history and a standard occupational physical, examination of all major organ systems, complete blood count with differential (CBC), and a SMAC/23 blood chemistry screen which includes calcium, phosphorous, glucose, uric acid, BUN, creatinine, albumin, SGPT, SGOT, LDH, globulin, A/G ratio, alkaline phosphatase, total protein, total bilirubin, triglyceride, cholesterol, and a creatinine/BUN ratio. Additionally a pulmonary function test will be performed by trained personnel to record Forced Vital Capacity (FVC) and Forced Expiratory Volume in second (FEVI.0). An audiogram and visual acuity measurement, including color perception, is provided. The medical exam is performed under the direction of a licensed Occupational Health Physician. A medical certification as to the fitness or unfitness for employment on hazardous waste projects, or any restrictions on his/her utilization that may be indicated, is provided by the physician. This evaluation will be repeated as indicated by substandard performance or evidence of particular stress that is evident by injury or time loss illness on the part of any worker.

6.3.2 SITE-SPECIFIC TRAINING

The Site Health and Safety Officer will be responsible for developing a site specific occupational hazard training program and providing training to all NYSDEC personnel that are to work at the site. This training will consist of the following topics:

- Names of personnel responsible for site safety and health.
- Safety, health, and other hazards at the site.
- Proper use of personal protective equipment.
- Work practices by which the employee can minimize risk from hazards.
- Safe use of engineering controls and equipment on the site.
- Acute effects of compounds at the site.
- Decontamination procedures.
- Upon completion of site-specific training, workers will sign the Site-Specific Training Form.

6.3.3 MONITORING REQUIREMENTS

There is no specific health and safety monitoring associated or anticipated to be conducted during the routine maintenance and monitoring of the site.

6.3.4 PERSONNEL PROTECTIVE EQUIPMENT

6.3.4.1 LEVEL D

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

- Standard Work Clothes
- Safety boots with steel-toes
- Nitrile outer and PVC inner gloves (must be worn during all sampling activities)
- Hard hat (must be worn during drilling and excavation activities)
- Splash goggles or safety glasses (where splash hazard is present)

6.4 WORK ZONES AND DECONTAMINATION

6.4.1 SITE WORK ZONES

To reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas, work zones will be delineated at the site. The flow of personnel between the zones should be controlled. The establishment of the work zones will help ensure that personnel are properly protected against the hazards present where they are working, work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

6.4.1.1 EXCLUSION ZONE

Exclusion zones will be established at the site for all sampling activities; unprotected onlookers should be located 50 feet upwind of sampling activities.

All personnel within the exclusion zone will be required to use the specified level of protection. No food, drink, or smoking will be allowed in the exclusion or decontamination zones. Contact lenses and cosmetics are not permitted on-site.

6.4.1.2 DECONTAMINATION ZONE

Should it be necessary to establish an exclusion zone, a decontamination zone will be utilized. This zone will be established between the exclusion zone and the support zone, and will include the personnel and equipment necessary for decontamination of equipment and personnel (discussed below). Personnel and equipment in the exclusion zone must pass through this zone before entering the support zone. This zone should always be located upwind of the exclusion zone.

6.4.1.3 SUPPORT ZONE

The support zone will include the remaining areas of the job site. Break areas, operational direction and support facilities (to include supplies, equipment storage and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the support zone from the exclusion zone without passing through the personnel or equipment decontamination station. Eating, smoking, and drinking will be allowed only in this area.

6.4.2 DECONTAMINATION

Generally, any water used in decontamination procedures will be disposed of onsite due to the low level of contaminants expected at the site.

6.4.2.1 DECONTAMINATION OF PERSONNEL

Decontamination will not be necessary if only Level D protection is used. However, disposable gloves used during sampling activities should be removed and bagged; personnel should be encouraged to remove clothing and shower as soon as is practicable at the end of the day. All clothing should be machine-washed. All personnel will wash hands and face prior to eating and before and after using the restroom.

6.4.2.2 DECONTAMINATION OF FIELD EQUIPMENT

Field Equipment decontamination procedures are discussed in Section 2.3.4 of the Post Closure Monitoring and Maintenance Plan.

6.5 ACCIDENT PREVENTION CONTINGENCY PLAN

6.5.1 ACCIDENT PREVENTION

6.5.1.1 SITE-SPECIFIC TRAINING

All field personnel will receive health and safety training prior to the initiation of any site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, regular meeting should be held. Discussion should include:

- Tasks to be performed.
- Time constraints (e.g., rest breaks, cartridge changes).
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals.
- Emergency procedures.

6.5.2 CONTINGENCY PLAN

6.5.2.1 EMERGENCY PROCEDURES

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

1) Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site.

2) A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

General emergency procedures, and specific procedures for personal injury, chemical exposure and radiation exposure, are described below.

6.5.2.2 CHEMICAL EXPOSURE

If a member of the field crew demonstrates symptoms of chemical exposure the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via voice and hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency.

- Precautions should be taken to avoid exposure of other individuals to the chemical.

- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.

- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.

- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.

- All chemical exposure incidents must be reported in writing to the Office Health and Safety Representative. The Site Health and Safety Officer or Field Team Leader is responsible for completing the accident report.

6.5.2.3 PERSONAL INJURY

In case of personal injury at the site, the following procedures should be followed:

- Another team member (buddy) should signal the Field Team Leader that an injury has occurred.

- A field team member trained in first aid can administer treatment to an injured worker.

- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.

- For less severe cases, the individual can be taken to the site dispensary.

- The Field Team Leader or Site Health and Safety Officer is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Office Health and Safety Representative. Follow-up action should be taken to correct the situation that caused the accident.

6.5.2.4 EVACUATION PROCEDURES

The Field Team Leader will initiate evacuation procedure by signaling to leave the site.

All personnel in the work area should evacuate the area and meet in the common designated area.

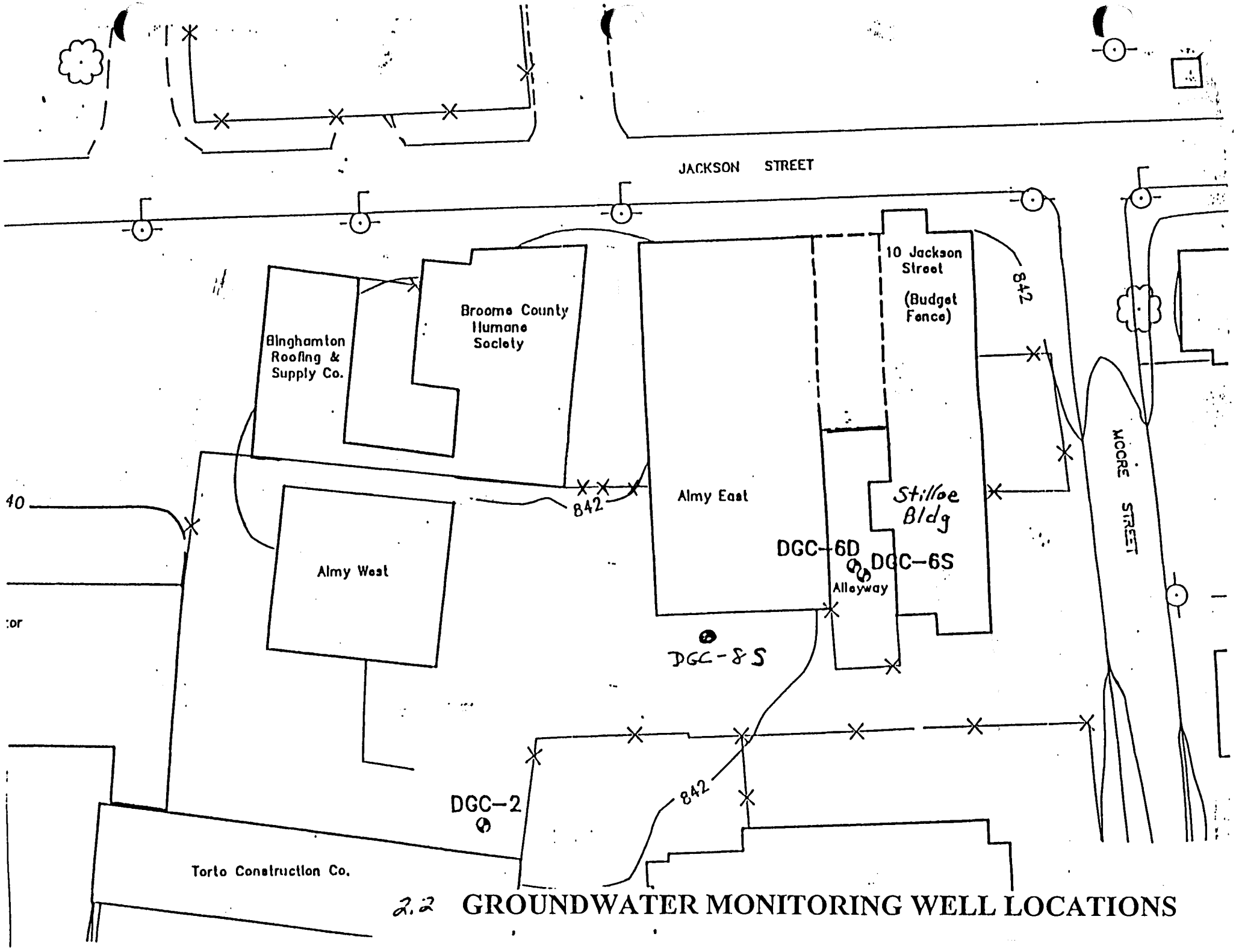
All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts of missing persons determined immediately.

Further instruction will then be given by the Field Team Leader.

6.5.2.5 PROCEDURES IMPLEMENTED IN THE EVENT OF A MAJOR FIRE, EXPLOSION, OR ON-SITE HEALTH EMERGENCY CRISIS

- Notify the paramedics and/or fire department, as necessary;
- Signal the evacuation procedure previously outlined and implement the entire procedure;
- Isolate the area;
- Stay upwind of any fire;
- Keep the area surrounding the problem source clear after the incident occurs;
- Complete accident report for and distribute to appropriate personnel.

A decision to notify local residents of emergency conditions at the site, will be made in consultation with local officials and the Fire Department.



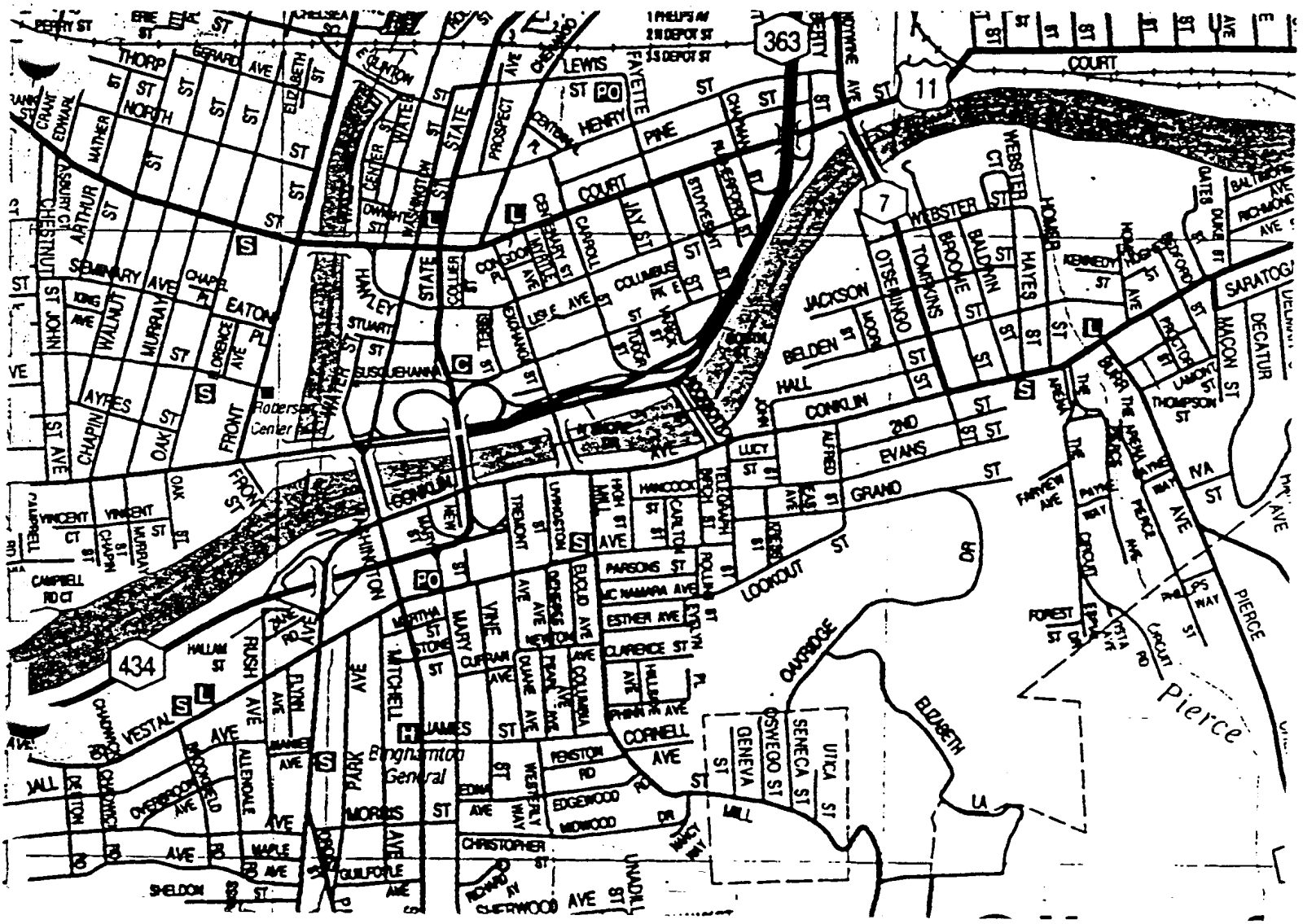
2.2 GROUNDWATER MONITORING WELL LOCATIONS

BINGHAMTON GENERAL HOSPITAL
20-42 MITCHELL AVENUE
BINGHAMTON, NY 13903

(607) 762-2231 EMERGENCY
(607) 762-2400 INFORMATION

Directions from the Almy Brothers site to the hospital:

1. Exit the Jackson Street gate
2. Turn right onto Tompkins Street
3. Turn right onto Conklin Avenue
4. Turn left onto S. Washington Street
5. Turn right onto Vestal Avenue
6. Turn left onto Park Avenue to **EMERGENCY ROOM**



APPENDIX A

GROUNDWATER SAMPLING RESULTS

TABLE 15A

Groundwater Sampling Results
Field Analyses

Almy Brothers Site
Binghamton, NY

	Temp (*C)	pH*	Specific Conductivity (umho)	Turbidity (NTU)**
First Phase RI (July 23 - 25, 1991)				
DGC-1	18.5	7-7.5	.950	ND 50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DGC-3	15	6-7	650	20
DGC-4	21.2	8	1,000	15
DGC-5	21	7.5	730	24
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Second Phase RI (September 15 - 16, 1992)				
DGC-1	16.1	6.05	1,250	>200
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DGC-3	14.3	4.26	750	27
DGC-4	17	6.05	1,000	>200
DGC-5	16.2	5.9	710	>200
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DGC-7S	15.8	6.51	348	>200
DGC-7D	14.4	6.58	900	>200

Still in Use

* During the first phase RI, pH was measured with pH strips. During the second phase RI, pH was measured with a pH meter.

** The groundwater at the Almy Brothers Site generally has high turbidity due to the high percentage of fine-grained particles in the soil. The high turbidity can result in high metals concentrations which are not representative of the groundwater being transported through the soil pore spaces. During the second phase RI, no metals analyses were performed on the groundwater samples, therefore each well was purged only until three well volumes were removed, rather than attempting to reduce the turbidity to less than 50 NTU.

TABLE 15B

Groundwater Sampling Results - July 1991
Target Compound List (TCL) Analysis
Almy Brothers Site
Binghamton, NY
Results are reported in ug/l (ppb).

Parameter	DGC-1	[redacted]	DGC-3	DGC-4	DGC-5	[redacted]	[redacted]	Duplicate DGC-6D	Surface Water from 10 Jackson St. Basement SW1	Standards(a)
Volatile Organics										
Acetone	ND 10	NA	ND 10	ND 10	NA	37	ND 10	ND 10	NA	50(b)
Carbon Disulfide	ND 5	NA	ND 5	ND 5	NA	ND 10	39	35	NA	50(b)
1,2-Dichloroethane	ND 5	NA	ND 5	ND 5	NA	8 J	ND 5	ND 5	NA	5
Benzene	ND 5	NA	ND 5	ND 5	NA	73	ND 5	ND 5	NA	0.7
Ethylbenzene	ND 5	NA	ND 5	ND 5	NA	14	ND 5	ND 5	NA	5
Xylene (total)	ND 5	NA	ND 5	ND 5	NA	63	ND 5	ND 5	NA	5
Propane, 2-methoxy-2-methyl*	ND	NA	16 J	22 J	NA	320 J	22 J	20 J	NA	50(b)
Cyclohexane*	ND	NA	ND	ND	NA	64 J	ND	ND	NA	50(b)
Cyclopentane, methyl- *	ND	NA	ND	ND	NA	9 J	ND	ND	NA	50(b)
Benzene, 1-ethyl-2-methyl-*	ND	NA	ND	ND	NA	77 J	ND	ND	NA	5(c)
TIC (total)*	ND	NA	16 J	22 J	NA	575 J	22 J	20 J	NA	100(d)
Semivolatile Organics										
2-Methylnaphthalene	ND 10	ND 10	ND 10	ND 12	ND 10	6 J	3 J	ND 10	ND 11	5
2-Cyclohexen-1-one*	ND	ND	ND	ND	9 J	ND	ND	ND	ND	50(b)
Benzene, 1-ethyl-2-methyl-(*	ND	ND	ND	ND	ND	46 J	35 J	ND	ND	5(c)
Benzene, 1,2,3-trimethyl-*	ND	ND	ND	ND	ND	38 J	30 J	ND	ND	5(c)
Benzene, -ethyl-dimethyl-*	ND	ND	ND	ND	ND	28 J	19 J	ND	ND	5(c)
Benzene, 1,2,3,4-tetramethyl*	ND	ND	ND	ND	ND	10 J	11 J	ND	ND	5(c)
Benzene, 1,2,3,5-tetramethyl*	ND	ND	ND	ND	ND	10 J	ND	ND	ND	5(c)
Benzene, propyl-*	ND	ND	ND	ND	ND	11 J	ND	ND	ND	5(c)
Benzene, 1,2-diethyl-*	ND	ND	ND	ND	ND	8 J	ND	ND	ND	5(c)
1H-Indene, 2,3-dihydro-1-met*	ND	ND	ND	ND	ND	10 J	ND	ND	ND	50(b)
1H-Indene, 2,3-dihydro-4-met*	ND	ND	ND	ND	ND	22 J	ND	ND	ND	50(b)
Benzene, methyl-*	ND	ND	ND	ND	ND	ND	ND	ND	13 J	5(c)
TIC (total)*	42 J	9 JB	126 J	24 J	105 J	252 J	196 J	18 J	13 J	100(d)

*TIC=Tentatively Identified Compounds reported in estimated concentrations.

(a) Standards for groundwater used as a drinking source according to NYSDEC Sept. 1991 6NYCRR Parts 700-705, Water Quality Regulations for Surface Waters and Groundwaters.

(b) NYSDOH Part 5 Sanitary Code Standard for unspecified organic contaminants.

(c) Standard for Principal Organic Contaminants (POCs).

(d) NYSDOH Part 5 Sanitary Code Standard for total POCs and VOCs.

BOLD Values in bold print exceed Groundwater Standards or Guidelines.

J Indicates an estimated value.

B Used when the analyte is found in the blank, as well as a sample. It indicates possible /probable blank contamination and warns data user to take appropriate action.

ND Not detected above the indicated instrument detection limit.

NA Not analyzed

Note: Analytes that were not detected in any of the referenced samples are not included in this table.

TABLE 5.15B (Continued)

Groundwater Sampling Results - July 1991
Pesticides and Herbicides
Almy Brothers Site
Binghamton, NY

Results are reported in ug/l (ppb).

Parameter	DGC-1	[redacted]	DGC-3	DGC-4	DGC-5	[redacted]	[redacted]	Duplicate of [redacted]	Surface Water from 10 Jackson St. Basement SW1	GW Standards(a)
Pesticides *										
Alpha-BHC	ND 0.02	ND 0.12	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	**0.02**	ND
Delta-BHC	ND 0.02	ND 0.12	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	**0.05**	ND
Dieldrin	ND 0.05	ND 0.24	ND 0.05	ND 0.05	ND 0.05	ND 0.05	**0.13(c)**	ND 0.05	**0.08**	ND
Gamma-Chlordane	ND 0.24	ND 1.2	**0.15 J(b)**	ND 0.24	ND 0.24	ND 0.24	**0.12(d)**	0.05 J (b)	ND 0.26	0.1
Gamma-BHC (Lindane)	ND 0.02	ND 0.12	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	ND 0.02	**0.06**	ND
Herbicides			DGC-3RE			[redacted]	[redacted]	Dup. of [redacted]		
2,4,5-T	R	R	ND 0.38	R	R	ND 0.19	ND 0.38	ND 0.08	1.6J	35
2,4-D	R	R	ND 0.77	R	R	50	ND 0.77	0.09 J	**23**	4.4
2,4,5-TP (Silvex)	R	R	ND 0.38	R	R	[redacted]	ND 0.38	**0.34 B**	**14**	0.26

(a) Standards for groundwater used as a drinking source according to NYSDEC Sept. 1991 6NYCRR Parts 700-705, Water Quality Regulations for Surface Waters and Groundwaters,
(b) Calculated from confirmation run.
(c) Quantitation not confirmed.
(d) Calculated from confirmation run and calculated using peak height (see calculation on chromatogram).
R=Rejected due to noncompliance with data validation criteria.
* Analytes that were not detected in any of the referenced samples were not included in this table.

BOLD Values in bold print exceed NYSDEC Groundwater Standards.
J Indicates an estimated value.
B Used when the analyte is found in the blank, as well as a sample. It indicates possible /probable blank contamination and warns data user to take appropriate action.
ND Not detected above the indicated instrument detection limit.
RE Sample was recollected and reanalyzed.

TABLE [illegible]B (Continued)

Groundwater Sampling Results - July 1991
Inorganics
Almy Brothers Site
Binghamton, NY
Results are reported in ug/l (ppb)

Parameter	DGC-1	[redacted]	DGC-3	DGC-4	DGC-5	[redacted]	[redacted]	Duplicate of DGC-6D	Surface Water from 10 Jackson St. Basement SW1	GW Standards*
Inorganics										
Aluminum	546	5,990	1,110	98 B	1,200	1,480	728	809	230	-
Antimony	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	ND 2	-
Arsenic	1.4 B	2.7 B	ND 1	ND 1	ND 1	11	ND 1	ND 1	1.9 B	25
Barium	101 B	872	20 B	97 B	114 B	175 B	69 B	65 B	25 B	1,000
Beryllium	ND 1	3 B	ND 1	ND 1	1 B	1 B	ND 1	1 B	ND 1	-
Cadmium	ND 3	ND 3	ND 3	ND 3	ND 3	3 B	3 B	ND 3	ND 3	10
Calcium	111,000	115,000	118,000	122,000	121,000	157,000	155,000	151,000	68,200	-
Chromium	ND 5	8 B	ND 5	ND 5	ND 5	6 B	ND 5	ND 5	ND 5	50
Cobalt	7 B	8 B	25 B	ND 6	ND 6	ND 6	ND 6	ND 6	ND 6	-
Copper	ND 6	18 B	15 B	ND 6	8 B	ND 6	7 B	ND 6	6 B	200
Iron	**2,450**	**52,800**	**831**	**387**	**1,240**	**17,900**	**1,590**	**1,860**	**505**	300
Lead	ND 1	17	ND 1	ND 1	ND 1	1 B	ND 1	ND 1	4.1 B	25
Magnesium	10,900	15,000	12,600	12,200	16,000	11,900	23,000	22,700	10,600	-
Manganese	**14,300**	**304**	**8,580**	**14,000**	**6,660**	**14,700**	**7,560**	**7,340**	**391**	300
Mercury	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	0.34	ND 0.2	ND 0.2	2
Nickel	13 B	21 B	42	ND 9	ND 9	ND 9	ND 9	ND 9	10 B	-
Potassium	9,820	16,400	9,120	15,200	8,730	12,700	5,730	5,850	16,300	-
Selenium	ND 1	ND 1	1.3 B	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	10
Silver	ND 6	ND 6	ND 6	ND 6	ND 6	ND 6	ND 6	ND 6	ND 6	50
Sodium	**112,000**	**113,000**	**31,100**	**98,700**	**42,000**	**89,900**	**80,900**	**76,800**	**31,700**	20,000
Thallium	ND 3 J	ND 3 J	ND 3 J	ND 3 J	ND 3 J	ND 3 J	ND 3 J	ND 3 J	ND 3 J	-
Vanadium	15 B	22 B	18 B	17 B	27 B	12 B	18 B	19 B	14 B	-
Zinc	25	74	78	19 B	50	21	41	45	114	300
Cyanide	ND 10	ND 10	ND 10	ND 10	10.1	ND 10	ND 10	ND 10	ND 10	100
Tin	ND 4	11	ND 4	ND 4	ND 4	ND 4	ND 4	ND 4	ND 4	-

* = Standards for groundwater used as a drinking source according to NYSDEC Sept. 1991 6NYCRR Parts 700-705, Water Quality Regulations for Surface Waters and Groundwaters.

ND = Not detected above the indicated instrument detection limit.

- No Standard available.

B = The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)

BOLD = Value exceeds NYSDEC Groundwater Standards.

TABLE 5.15C

Groundwater Sampling Results - September 1992
Volatile Organics, Pesticides and Herbicides
Almy Brothers Site
Binghamton, NY

Results are reported in ug/l (ppb).

Parameter	DGC-1	[redacted]	DGC-3	DGC-4	DGC-5	[redacted]	Duplicate [redacted]	[redacted]	DGC-7S	DGC-7D	PW-1	Standards(a)
Volatile Organics												
Methylene Chloride	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	ND 5	5	NA	
Acetone	ND 10	6 J	ND 10	ND 10	ND 10	**140**	ND 10	ND 10	ND 10	6 J	NA	50(b)
Carbon Disulfide	7	8	ND 5	ND 5	ND 5	3 J	ND 5	ND 5	ND 5	ND 5	NA	50(b)
Pentane, 2-methyl-*	ND	ND	ND	ND	ND	**180 J**	ND	ND	ND	ND	NA	50(b)
Pentane, 2,3-dimethyl-*	ND	ND	ND	ND	ND	**51 J**	ND	ND	ND	ND	NA	50(b)
Cyclohexane, methyl-*	ND	ND	ND	ND	ND	**56 J**	ND	ND	ND	ND	NA	50(b)
Cyclopentane, 4,4-dimethyl- *	ND	ND	ND	ND	ND	26 J	ND	ND	ND	ND	NA	50(b)
Benzene, 1-ethyl-2-methyl-*	ND	ND	ND	ND	ND	**89 J**	ND	ND	ND	ND	NA	5(c)
1H-Indene, 2,3-dihydro-4-met*	ND	ND	ND	ND	ND	33 J	ND	ND	ND	ND	NA	50(b)
TIC (total)*	13 J	54 J	ND	18 J	ND	**930 J**	ND	ND	ND	**108**	NA	100(d)
Pesticides												
Dieldrin	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.1	ND 0.12	ND 0.1	ND 0.1	ND 0.1	ND
Gamma-Chlordane	ND 0.05	ND 0.05	ND 0.05	ND 0.05	ND 0.05	ND 0.05	ND 0.05	ND 0.06	ND 0.05	ND 0.05	0.07	0.1
Herbicides							**Duplicate DGC-6S**					
2,4,5-T	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	0.4	0.5	ND 0.2	ND 0.2	ND 0.2	NA	35
2,4-D	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	12	15	ND 0.2	ND 0.2	ND 0.2	NA	4.4
2,4,5-TP (Silvex)	ND 0.2	ND 0.2	ND 0.2	ND 0.2	ND 0.2	10	15	ND 0.2	ND 0.2	ND 0.2	NA	0.26

*TIC=Tentatively Identified Compounds reported in estimated concentrations.

(a) Standards for groundwater used as a drinking source according to NYSDEC Sept. 1991 6NYCRR Parts 700-705, Water Quality Regulations for Surface Waters and Groundwaters.

(b) NYSDOH Part 5 Sanitary Code Standard for unspecified organic contaminants.

(c) Standard for Principal Organic Contaminants (POCs).

(d) NYSDOH Part 5 Sanitary Code Standard for total POCs and VOCs.

BOLD Values in bold print exceed Groundwater Standards or Guidelines.

J Indicates an estimated value.

B Used when the analyte is found in the blank, as well as a sample. It indicates possible /probable blank contamination and warns data user to take appropriate action.

ND Not detected above the indicated instrument detection limit.

ND Not analyzed

Note: Analytes that were not detected in any of the referenced samples are not included in this table.

TABLE 5.15C (Continued)

Groundwater Sampling Results - September 1992
Semivolatile Organics
Almy Brothers Site
Binghamton, NY

Results are reported in ug/l (ppb).

Parameter	DGC-1	[redacted]	DGC-3	DGC-4	DGC-5	[redacted]	Duplicate [redacted]	[redacted]	DGC-7S	SGC-7D	Standard (a)
Semivolatile Organics											
2,4-Dichlorophenol	ND 10	ND 10	ND 10	ND 10	ND 10	14.5	13.5	ND 10	ND 10	ND 10	1
2-Methylnaphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	0.2 J	2 J	ND 10	ND 10	ND 10	5
2,4,6-Trichlorophenol	ND 10	ND 10	ND 10	ND 10	ND 10	0.5 J	0.4 J	ND 10	ND 10	ND 10	1
Diethylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1 J	50
Bis(2-Ethylhexyl) Phthalate	2 J	8 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	50
Benzene, propyl-*	ND	ND	ND	ND	ND	ND	8 J	ND	ND	ND	5(c)
Benzene, 1-ethyl-2-methyl-(*	ND	ND	ND	ND	ND	52 J	36 J	ND	ND	ND	5(c)
Benzene, 1,2,4-trimethyl-*	ND	ND	ND	ND	ND	ND	18 J	ND	ND	ND	5(c)
Benzene, 1,3,5-trimethyl-*	ND	ND	ND	ND	ND	29 J	ND	ND	ND	ND	5(c)
Benzene, (1-ethyl-2-methyl*	ND	ND	ND	ND	ND	ND	12 J	ND	ND	ND	5(c)
Benzene, 1,2-diethyl-*	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	5(c)
Benzene, (1-methylethyl)-*	ND	ND	ND	ND	ND	19 J	ND	ND	ND	ND	5(c)
Benzene, 1-methyl-2-propyl-*	ND	ND	ND	ND	ND	10 J	ND	ND	ND	ND	5(c)
Benzene, 1-methyl-4-(1-methyethyl)*	ND	ND	ND	ND	ND	13 J	16 J	ND	ND	ND	5(c)
Benzene, 1,2,3,5-tetramethyl*	ND	ND	ND	ND	ND	8 J	12 J	ND	ND	ND	5(c)
1H-Indene, 2,3-dihydro-4-met*	ND	ND	ND	ND	ND	10 J	16 J	ND	ND	ND	50(b)
1H-Indene, 2,3-dihydro-1,2-d*	ND	ND	ND	ND	ND	2 J	4 J	ND	ND	ND	50(b)
Acetic acid	ND	ND	ND	ND	ND	14 J	ND	ND	ND	ND	5(c)
TIC (total)*	ND	ND	ND	ND	ND	278 J	241 J	80 J	19 J	8 J	100(d)

*TIC=Tentatively Identified Compounds reported in estimated concentrations.

(a) Standards for groundwater used as a drinking source according to NYSDEC Sept. 1991 6NYCRR Parts 700-705, Water Quality Regulations for Surface Waters and Groundwaters.

(b) General Organic Guidance Value.

(c) Standard for Principal Organic Contaminants.

(d) NYSDOH Part 5 NYS Sanitary Code Standard for Unspecified Organic Contaminants.

BOLD Values in bold print exceed Groundwater Standards or Guidelines.

J Indicates an estimated value.

B Used when the analyte is found in the blank, as well as a sample. It indicates possible /probable blank contamination and warns data user to take appropriate action.

ND Not detected above the indicated instrument detection limit.

Note: Analytes that were not detected in any of the referenced samples are not included in this table

APPENDIX B

GROUNDWATER MONITORING WELL LOGS

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-02

PROJECT	Almy Brothers Site					SHEET 1 OF 2	
CLIENT	NYSDEC					JOB No.	00296-01946
DRILLING CONTRACTOR	H & S Borings Inc.					MEAS. PT. ELEV.	842.72
PURPOSE	Monitoring Well					GROUND ELEV.	840.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	MSL
DRILL RIG TYPE	Mobile B-34	TYPE	SS		HSA	DATE STARTED	04/23/91
GROUNDWATER ELEV.	835.04'	DIA.	2" OD		6 1/4	DATE FINISHED	04/24/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	L. Charbonneau, Jr.
DATE OF MEASUREMENT	7/23/91	FALL	30"			INSPECTOR	M. Williams

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-1	28 16 21 27	ML		Bk $s, mf S, t f G		Rec = 1.8 Moist
					Black SILT some, medium to fine Sand, trace fine Gravel (ML).		
2	S-2		SP		Br cm(+)f S, s $, l f G; occ tar chip and porcelain		Rec = 1.0 Moist
4	S-3	5 3 1 1	GP		Br mf G s, mf S, l $; cinders		Rec = 0.5 Wet
6	S-4	4 6 2 2	SP		Br cm(-)f S, s $, t f G cinders.		Rec = 0.3 Wet
					Brown coarse, medium (+) to fine SAND, some Silt, trace fine Gravel; cinders (SP).		
8	S-5	3 2 3 5			Do		Rec = 0.6 Wet
					(FILL)		
						830.9	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-02
PROJECT: Almy Brothers Site		SHEET 2 OF 2
CLIENT: NYSDEC		JOB No. 00296-01946

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-6	3 5 7 9	ML/MH		Gr $&C	9.8	Rec = 1.0 Wet
12	S-7	12 15 12 12	MH		Gr $&C, t f G Gray SILT and CLAY trace, fine Gravel (ML/MH).		Rec = 0.4 Very Wet
14	S-8	7 15 23 25	GP		(FLOOD-PLAIN SILT)	825.2	Rec = 0.0 MG blocked shoe resample Wet Rec = 0.2
16					Gr mf G a, f S, s $&C Gray medium to fine GRAVEL and, fine Sand, some Silt & Clay (GP). (STRATIFIED DRIFT)	15.5 823.7	
					End of Boring Sampled to 16.0'. Augered to 17.0'.	17.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-06S

PROJECT	Almy Brothers Site					SHEET 1 OF 1	
CLIENT	NYSDEC					JOB No.	00296-01946
DRILLING CONTRACTOR	H & S Borings Inc.					MEAS. PT. ELEV.	844.82
PURPOSE	Monitoring Well					GROUND ELEV.	842.5
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	MSL
DRILL RIG TYPE	CME-55	TYPE	NA		HSA	DATE STARTED	05/02/91
GROUNDWATER ELEV.	832.22'	DIA.			4 1/4	DATE FINISHED	05/02/91
MEASURING POINT	Top of PVC	WEIGHT				DRILLER	L. Charbonneau, Jr.
DATE OF MEASUREMENT	07/23/91	FALL				INSPECTOR	C. Gaule

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					See boring log for DGC-6D		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-06D

PROJECT	Almy Brothers Site					SHEET 1 OF 4	
CLIENT	NYSDEC					JOB No.	00296-01946
DRILLING CONTRACTOR	H & S Borings Inc.					MEAS. PT. ELEV.	844.73
PURPOSE	Monitoring Well					GROUND ELEV.	842.8
DRILLING METHOD	HSA/Drive Casing		SAMPLE	CORE -	CASING	DATUM	MSL
DRILL RIG TYPE	Mobile/CME-55	TYPE	SS		Steel	DATE STARTED	04/26/91
GROUNDWATER ELEV.	831.89'	DIA.	2" OD		6.25/4.25	DATE FINISHED	04/30/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	L. Charbonneau, Jr.
DATE OF MEASUREMENT	07/23/91	FALL	30"			INSPECTOR	C. Gaule

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-1	7 15 10 6	SW		Bk cmf S, a $, l f G, cinders		Rec = 1.5 Dry
					Black coarse to fine SAND, and Silt, little fine Gravel; cinders (SW).	841.3	
					(FILL)	1.5	
2	S-2	4 6 9 10	ML		Br Cy$ t, f S Do; occ f S lyr		Rec = 1.0 Moist
						838.8	
4	S-3	12 8 20 30	SP ML		Br f S, l $ Br $ s, f S	4.0 838.3 4.5	Rec = 1.4 Moist/Wet
6	S-4	3 5 5 6			Br $ s, f S; mottled red brown Brown SILT some, fine Sand; mottled brown (ML).		Rec = 1.2 Moist
8	S-5	4 5 6 6	SP		Br $ s, f S (FLOOD-PLAIN SILT)	833.6	Rec = 1.5 Wet
					Br mf(+) S, s $ mottled red brown (STRATIFIED DRIFT)	9.2	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-06D
PROJECT: Almy Brothers Site		SHEET 2 OF 4
CLIENT: NYSDEC		JOB No. 00296-01946

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-6	1 2 3 6	SP		Br mf(+) S, s $		Rec = 1.6 Wet
					Gr mf(+) S, s $		
12	S-7	2 2 3 6	ML SP		Br gr $s, mf S Br cmf(+)S, s $ Brown medium to fine (+) SAND, some Silt (SP).		Rec = 2.0 Wet
14	S-8	3 2 3 9			Gr cmf(+) S, s $, t f G Gr cmf(+) S, l $, l f G Br cmf(+) S, s $ Brown coarse to fine (+) SAND, some Silt (SP).	828.5 14.3	Rec = 1.8 Wet
16	S-9	9 19 8 10			Gr bn cmf(+) S, s $ Gr mf(+) G s cmf S, t $		Rec = 0.6 Wet
18	S-10	10 9 3 9	SP		Br cm(+)f S, l $, l f G		Rec = 0.3 Wet
20	S-11	4 10 7 3	GP		Br f G s(-), cm(+)f S, l $ Brown fine GRAVEL some (-), coarse to fine (+) Sand, little Silt (GP). (STRATIFIED DRIFT)	820.8	Rec = 0.2 Wet
22		20	ML		Br CyS a, mf(+) S, s f G (GLACIAL LAKE BED)	22.0	Rec = 0.5

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. DGC-06D
PROJECT Almy Brothers Site		SHEET 3 OF 4
CLIENT NYSDEC		JOB No. 00296-01946

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-12	30 31 29			Brown Clayey SILT and, medium to fine (+) Sand, some fine Gravel (ML).		Wet (Dense)
24						818.8	
	S-13	14 45 56 24	SW		Br cmf S, l(+) s f G Brown coarse to fine SAND, little (+) Silt, some fine Gravel (SW)	24.0 816.8	Rec = 1.0 Wet
26	S-14	12 25 23 14	ML		Br Cy$ a, cmf S, l f G	26.0	Rec = 0.6 Wet (Dense)
28	S-15	26 39 36 24	SW		(GLACIAL LAKE BED) Br cmf S, s $, a mf G	814.8 28.0	Rec = 1.0 Wet
30	S-16	29 31 23 39	GP		Br m(+)f G a, cmf (-) S, s $ Brown medium (+) to fine GRAVEL and, coarse to fine (-) Sand, some silt (GP).		Sands entering the casing. Rec = 0.5 Wet
32	S-17	52 33 22 20	GP		Br mf G s(+), cmf S, l $		Rec = 0.3 Wet
34		26 22			(STRATIFIED DRIFT)		Rec = 0.0

Dunn Geoscience Corporation
Albany, NY 12205 · (518)458-1313

TEST BORING LOG

BORING No. DGC-06D

PROJECT: Almy Brothers Site | SHEET 4 OF 4

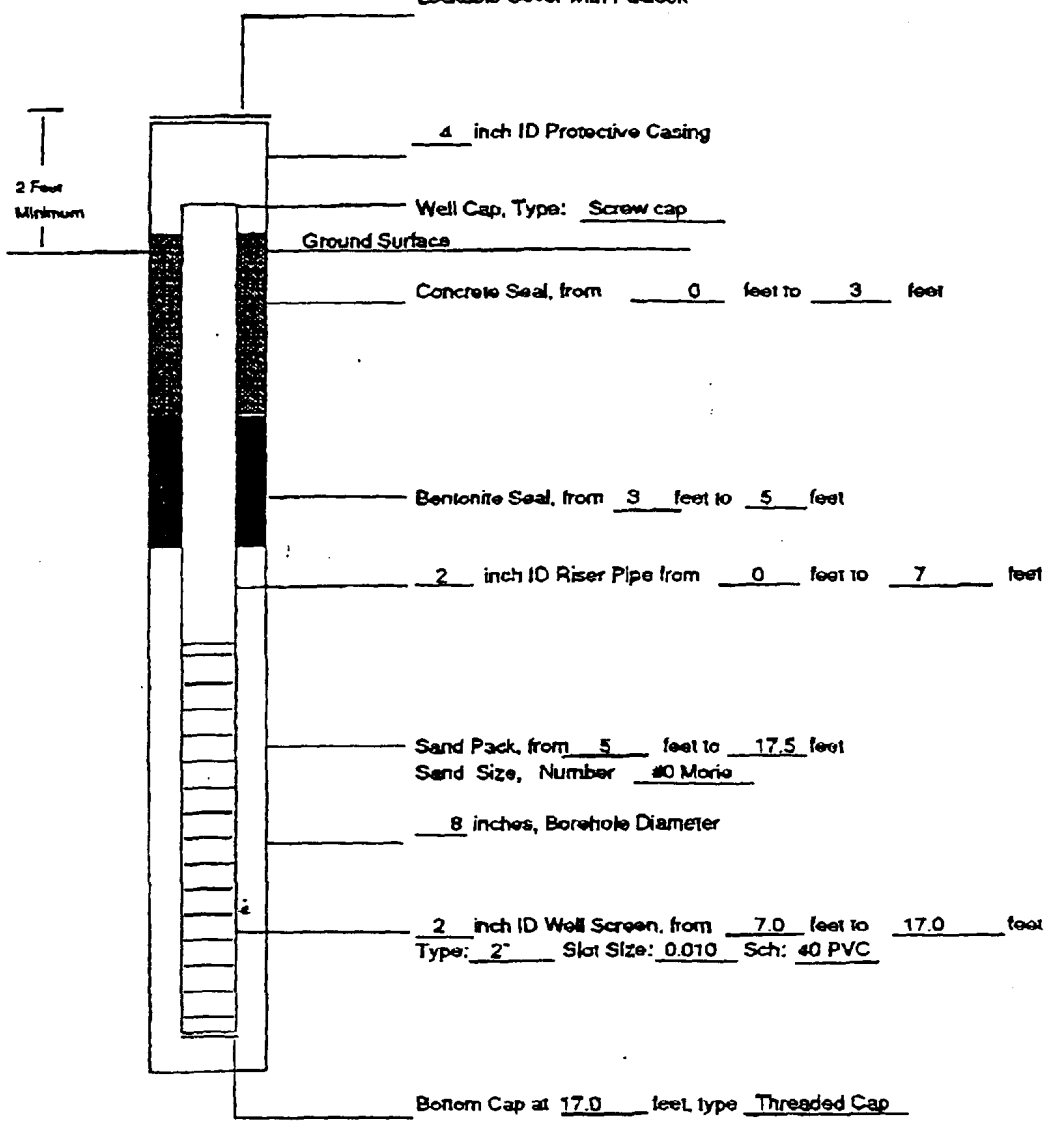
CLIENT: NYSDEC | JOB No. 00296-01946

DEPTH	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-18	53					
		53					
36		19			Br cmf S, s(-) $, t f G		Rec = 0.4 Wet
	S-19	20			Brown coarse to fine SAND, some (-) Silt, trace fine Gravel (SW).		
		21					
		100/0.4					
38		59			Br mf(+) S, s $, t f G		Rec = 0.5 Wet
	S-20	46					
		41	SP				
		45			(STRATIFIED DRIFT)	802.8	
40		22			Gn gr $&C s, mf G	40.0	Rec = 0.4 Wet
	S-21	22			Green gray SILT & CLAY some, medium to fine Gravel (ML).		
		14	ML		(GLACIAL TILL)		
		20				800.8	
42					End of Boring Sampled to 42.0'. Augered to 42.0'.	42.0	

DGC-85

TAMS CONSULTANTS, Inc. **WELL LOG** **Well No. DGC-85**

Project: ALMY BROTHERS SITE	Location: Binghamton, New York	Page 1 of 1		
Project No.: 5778	Contractor: ETG Environmental	Water Levels		
Surface Elevation: na	Driller: EP&S	Date	Time	Depth
	Well Permit No.:			
Top of PVC Casing Elevation: 844.53	TAMS Rep.: John Egan			
Datum: ngvd	Date of Completion: July 12, 1997			



Note: All measurements based on ground surface at 0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

APPENDIX C

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
DDT - A FORMER CHLORINATED PESTICIDE

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that

Section I

Manufacturer's Name NOT CURRENTLY MANUFACTURED	Emergency Telephone Number N/A
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information N/A
	Date Prepared 7/28/95
	Signature of Preparer (optional) A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
DDT , DICHLORO DIPHENYL TRICHLORETHANE	1.0 MG/M3			95+%

A WHITE CHRYSTALLINE POWDER INSOLUBLE IN WATER BUT SOLUBLE IN MOST ORGANIC SOLVENTS OR WITH SURFACTANTS. HISTORICALLY ALSO SOLD IN SOLVENT SOLUTION OR AS WATER EMULSION.

Section III — Physical/Chemical Characteristics

Boiling Point EST. AT GREATER THAN	$400^{0}F$	Specific Gravity (H_2O = 1)	2+
Vapor Pressure (mm Hg) 1.5 X 10-7 MM/HG AT 68 DEG.F		Melting Point	$108^{0}F$
Vapor Density (AIR = 1)	10+	Evaporation Rate (Butyl Acetate = 1) NEGLIGIBLE	

Solubility in Water
INSOLUBLE

Appearance and Odor
WHITE TO GREY POWDER FAINT OR NO ODOR IN PURE FORM

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
IN EXCESS OF 300 DEGREES COC	NOT APPLICABLE		

Extinguishing Media
WATER, FOAM OR DRY CHEMICAL

Special Fire Fighting Procedures
SCBA EQUIPMENT WOULD BE NEEDED BOTH BECAUSE OF THE PURE CHEMICAL VAPOR AND ITS PYROLYSIS PRODUCTS

Unusual Fire and Explosion Hazards
FIRE - PHOSGENE AND HCL GASES ARE GENERATED AT HIGH TEMPERATURES

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		KEEP AWAY FROM ANY FOOD SOURCES OR STRONG OXIDIZERS
	Stable	X	

Incompatibility (*Materials to Avoid*)
NOT APPLICABLE

Hazardous Decomposition or Byproducts
PHOSGENE AND HCL BUT ONLY AT HIGH TEMPERATURES OF 600 + DEGREES F

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry. Inhalation? YES, AS DUST PRIMARILY Skin? ABSORBS ACROSS INTACT SKIN Ingestion? THIS COMPOUND IS STORED IN THE FAT TISSUE BUT HAS LIMITED IF ANY ACUT EFFECTS EXCEPT AT VERY HIGH DOSE.

Health Hazards (*Acute and Chronic*)

ORAL LD50 (RATS) 250 MG/KG

DERMAL LD50 (RATS) 2500MG/KG

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?
SUSPECTED CARCINOGEN NOT CONFIRMED IN MAN

Signs and Symptoms of Exposure
ACUTELY THIS COMPOUND HAS SHOWN VERY LIMITED ADVERSE EFFECTS IN MAN OR EXPERIMENTAL ANIMALS. THE DUST IS SLIGHTLY IRRITATING TO THE EYE AND SKIN.

Medical Conditions Generally Aggravated by Exposure INHALATION EFFECTS ARE ALMOST EXCLUSIVELY THROUGH CONTACT OR INHALATION AND SOME LIVER AND KIDNEY IMPACTS HAVE BEEN REPORTED IN THE OLDER LITERATURE.

Emergency and First Aid Procedures NO DEATHS IN MAN FROM ACCIDENTAL OR DELIBERATE INGESTION OR OCCUPATIOI EXPOSURE HAVE BEEN REPORTED. POSSIBLE LATENT CONCERNS ARE FOR LIVER CANCER INDUCTION OBSERVED AT HIGHER DOSES IN EXPERIMENTAL ANIMALS

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Waste Disposal Method
ABSORB WITH CLAY OR SIMILAR PRODUCTS FOR DISPOSAL IN AN APPROVED EPA LANDFILL OR BY INCINERATION

Precautions to Be Taken in Handling and Storing
AVOID DIRECT SKIN CONTACT. USE INPERVIOUS GLOVES OR SIMILAR HAND PROTECTION PREVENT CLOTHING AND OTHER GARMENT CONTAMINATION.

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
HALF-FACE NIOSH-APPROVED PESTICIDE CARTRIDGE RESPIRATOR WHERE LEVELS EXCEED THE TLV OF 1.0 MG/M3 AS IN SPRAYING APPLICATIONS.

Ventilation			
	Local Exhaust: NOT APPLICABLE CURRENTLY	Special	
	Mechanical (General): NOT APPLICABLE	Other	

Protective Gloves: HEAVY RUBBER GLOVES OR EQUIVALENT
Eye Protection:

Other Protective Clothing or Equipment
TYVEK OR SIMILAR OUTER GARMENTS FOR CLEAN-UP PURPOSES

Work/Hygienic Practices
GOOD PERSONAL HYGIENE MANDATORY. DO NOT HANDLE IN EATING AREAS OR WHERE FOOD, ETC. IS STOREI PREVENT PERSONAL CLOTHING CONTAMINATION. MINIMALLY, THOROUGHLY WASH HANDS FACE OR OTHER EXPOSED SKIN WHEN LEAVING AREA OF LIKELY EXPOSURE.

Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
2,4, D HERBICIDE

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that

Section I

Manufacturer's Name HISTORICALLY NUMEROUS BUT NOT CURRENTLY	Emergency Telephone Number IN U.S.
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
N.A.	Date Prepared 7/28/95
	Signature of Preparer (optional) A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
2,4, D or 2,4 DICHLORO PHENOXY ACETIC ACID				
A YELLOW TO WHITE CHRYSTALINE SOLID		TLV 10 MG/M3		
USUALLY SOLD IN A SOLVENT SOLUTION AS A				
BROAD LEAF PLANT HERBICIDE OR AS A				
WETABLE EMULSION FOR SPRAY APPLICATION.				

Section III — Physical/Chemical Characteristics

Boiling Point	160° F	Specific Gravity (H_2O = 1)	1.14
Vapor Pressure (mm Hg) LESS THAN 0.01 MM/HG AT 20 DEGREES C		Melting Point	138°F
Vapor Density (AIR = 1)	8	Evaporation Rate (Butyl Acetate = 1)	NOT VOLATILE EXCEPT AT VERY HIGH TEMPERATURES

Solubility in Water
VERY SLIGHTLY SOLUBLE

Appearance and Odor
FAINT ODOR IN PURE FORM

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
300 DEGREES + COC	N.A.		

Extinguishing Media
WATER, FOAM, CO2 OR DRY CHEM

Special Fire Fighting Procedures
THIS PRODUCT WILL NOT BURN READILY UNLESS DILUTED IN SOLVENTS FOR FIELD APPLICATION IN WHICH CASE THE SOLVENT IS THE LIMITING FACTOR.

Unusual Fire and Explosion Hazards
WILL GENERATE PHOSGENE, HCL AND 2,4,D VAPORS AT HIGH TEMPERATURES ALL OF WHICH MANDATE THE USE OF SCBA EQUIPMENT.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	

Incompatibility (*Materials to Avoid*)
KEEP AWAY FROM OXIDIZERS OR CAUSTICS

Hazardous Decomposition or Byproducts
PHOSGENE AND HCL IN A FIRE

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? INHALATION HAZARD AS DUST OR MIST PRIMARILY. Skin? WILL CROSS THE INTACT SKIN BUT NOT READILY IN QUANTITIES OF HEALTH SIGNIFICANCE. Ingestion? ORALLY TOXIC IN MAN AFFECTING THE LIVER AND KIDNEYS WITH CHRONIC LONG-TERM EXCESSIVE EXPOSURE.

Health Hazards (*Acute and Chronic*)

Carcinogenicity: NTP? NONE IN ANY SCIENTIFIC LITERATURE IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure
ACUTE IRRITATING (MODERATE) BY INHALATION, AND FROM SKIN OR EYE CONTACT.

Medical Conditions Generally Aggravated by Exposure LONG-TERM, HIGH EXPOSURES CAN RESULT IN SYSTEMIC EFFECTS TO THE KIDNEY, LIVER AND CENTRAL NERVOUS SYSTEM

Emergency and First Aid Procedures
FLUSH EYES WITH WATER FOR 15 MINUTES. IF INGESTED, INDUCE VOMITING. INHALATION EXPOSURES MUST BE TREATED SYMPTOMATICALLY WITH EMPHASIS ON IRRITATION AND THE TARGET ORGAN FUNCTION AFTER REMOVAL FROM EXPOSURE.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
THIS MATERIAL CAN BE ABSORBED WITH CLAY OR A NUMBER OF ORGANIC COMMERCIAL COMPOUNDS. FOR CLEANING AND DISPOSAL EITHER BY INCINERATION OR LANDFILL BUT ONLY IN EPA-APPROVED FACILITIES

Waste Disposal Method
CHEMICAL TREATMENT FOR REMOVAL AND DEGRADATION OR CONTROLLED BURIAL OF LOWER LEVEL WASTE.

Precautions to Be Taken in Handling and Storing
AVOID SKIN CONTACT OR INHALATION OF DUSTS OR MISTS. KEEP STORED WELL AWAY FROM FOOD ITEMS OR AREAS AFFECTING WILDLIFE

Other Precautions
SKIN AND EYE PROTECTION WHEN HANDLING THE PURE OR CONCENTRATED MATERIALS.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
NIOSH-APPROVED WITH PESTICIDE CARTRIDGES

Ventilation		
	Local Exhaust: NOT APPLICABLE EXCEPT FOR BLENDING OR SPRAYING OPERATIONS.	Special
	Mechanical (General)	Other

Protective Gloves | Eye Protection

Other Protective Clothing or Equipment
FULL BODY (TYVEK) OR OTHER OUTER CLOTHING WHEN CLEANING UP SPILLS OR WASTE

Work/Hygienic Practices
GOOD PERSONAL HYGIENE REQUIRED TO PRECLUDE EYE AND SKIN IRRITATION EFFECTS AND INCIDENTAL INGESTION.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

ENTITY (As Used on Label and List)
2,4,5 T P HERBICIDE

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Section I

Manufacturer's Name	Emergency Telephone Number
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
	Date Prepared: 7/31/95
	Signature of Preparer (optional): A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
2,4,5 TRICHLORO PHENOXY PROPIONIC ACID (2,4,5 TP). ALSO CALLED SILVEX OR WEED B GON A HERBICIDE	THIS COMPOUND HAS NO OFFICIAL TLV. HOWEVER, BASED ON ITS CHEMICAL SIMILARITY TO 2,4,D AN EXPOSURE GUIDELINE OF 10 MG/M3 OR LESS WOULD BE APPROPRIATE.			

Section III — Physical/Chemical Characteristics

Boiling Point: ESTIMATED 200 DEGREES C MINIMUM		Specific Gravity (H_2O = 1): 1.15	
Vapor Pressure (mm Hg): NEGLIGIBLE		Melting Point: APPROX 150 DEGREES C	
Vapor Density (AIR = 1): 8-9		Evaporation Rate (Butyl Acetate = 1): NEGLIGIBLE	

Solubility in Water: VERY SLIGHTLY SOLUBLE

Appearance and Odor: FAINT HYDROCARBON ODOR

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
GREATER THAN 300 DEGREES F COC	N.A.		

Extinguishing Media: CO2 FOAM, DRY CHEM, WATER

Special Fire Fighting Procedures: MINIMIZE THE USE OF WATER TO PRECLUDE OFF-SITE MIGRATION FOR CONTROLLING IMPACTS ON STREAMS OR VEGETATION

Unusual Fire and Explosion Hazards: AT ELEVATED TEMPERATURES, THE COMPOUND MAY BE VOLATILIZED AND/OR DECOMPOSE TO FORM HCL OR PHOSGENE

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS OR ALKALINE SOLUTIONS.

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts
ONLY UNDER FIRE CONDITIONS

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? POSSIBLE W/SPRAY MIST Skin? WILL CAUSE MINOR Ingestion? RAT LD50

Health Hazards (Acute and Chronic) APPLICATIONS AND/OR IRRITATIONS WITH CONTACT 650 MG/KG
FIRES ONLY NO INDICATION OF
SIGNIFICANT SKIN
ABSORPTION.

Carcinogenicity: NTP? LIMITED HUMAN IARC Monographs? EVIDENCE OF CANCER IN OSHA Regulated?
IARC MONOGRAPHS

Signs and Symptoms of Exposure
ACUTE IRRITATION AND BURNING SENSATION FROM INHALATION OF MISTS OR CONTACT MAY WITH PURE COMPOUND CAUSE SKIN ERYTHEMA

Medical Conditions Generally Aggravated by Exposure LIVER OR KIDNEY PROBLEMS

Emergency and First Aid Procedures
FLUSH EYES W/WATER 15 MIN. IF INGESTED, INDUCE VOMITING. INHALATION EXPOSURES MUST BE TREATED SYMPTOMATICALLY WITH EMPHASIS ON THE TARGET ORGAN FUNCTION AFTER REMOVAL FROM EXPOSURE.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
THIS MATERIAL CAN BE ABSORBED WITH CLAY OR A NUMBER OF ORGANIC COMMERCIAL COMPOUNDS FOR CLEAN-UP AND DISPOSAL EITHER BY INCINERATION OR LANDFILL BUT ONLY IN EPA-APPROVED FACILITIES.

Waste Disposal Method
CHEMICAL TREATMENT FOR REMOVAL AND DEGRADATION OR CONTROLLED BURIAL OF LOWER LEVEL WASTE.

Precautions to Be Taken in Handling and Storing
AVOID SKIN CONTACT OR INHALATION OF DUSTS OR MISTS. KEEP STORED WELL AWAY FROM FOOD ITEMS OR AREAS AFFECTING WILDLIFE.

Other Precautions
SKIN AND EYE PROTECTION WHEN HANDLING THE PURE OR CONCENTRATED MATERIALS.

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
NIOSH-APPROVED WITH PESTICIDE CARTRIDGES.

Ventilation		
	Local Exhaust: NOT APPLICABLE EXCEPT FOR BLENDING OPERATIONS.	Special: OR SPRAY APPLICATIONS.
	Mechanical (General)	Other

Protective Gloves | Eye Protection

Other Protective Clothing or Equipment
FULL BODY (TYVEK) OR OTHER OUTER CLOTHING WHEN CLEANING UP SPILLS OR WASTE

Work/Hygienic Practices
GOOD PERSONAL HYGIENE REQUIRED TO PRECLUDE EYE AND SKIN EFFECTS AND INCIDENTAL INGESTION.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
ENDRIN

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Section I

Manufacturer's Name
NO LONGER MANUFACTURED FOR USE IN THE

Emergency Telephone Number

Address (Number, Street, City, State, and ZIP Code)
U.S.

Telephone Number for Information

Date Prepared
7/31/95

Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
ENDRIN - A STERIOISOMER OF DIELDRIN OR		0.1 MG/M3*		
1,2,3,4,10,10 HEXACHLORO 6,7 EPOXY				
1,4,4,5,6,7,8,8 OCTAHYDRO ENDO				
ENDO 1,4:5,8 DIMETHANO NAPHTHALENE				
A CHLORINATED PESTICIDE				
*ABSORBS READILY THROUGH THE INTACT SKIN				

Section III — Physical/Chemical Characteristics

Boiling Point: 245 DEGREES C - DECOMPOSES		Specific Gravity (H_2O = 1): EST. 1.2	
Vapor Pressure (mm Hg): 2 X 10^{-7} MM/HG AT 77 DEGREES F.		Melting Point: 200 DEGREES C	
Vapor Density (AIR = 1): 10 PLUS		Evaporation Rate (Butyl Acetate = 1): NEGLIGIBLE	

Solubility in Water
INSOLUBLE

Appearance and Odor
FAINT HYDROCARBON CHEMICAL ODOR (PURE COMPOUND)

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
OVER 300 DEGREES F - COC			

Extinguishing Media
CO2 DRY CHEM FOAM AND WATER

Special Fire Fighting Procedures
WATER NOT RECOMMENDED BECAUSE OF POTENTIAL ADVERSE ECOLOGICAL IMPACTS ON RECEIVING STREAMS, GROUNDWATER OR SEWERS.

Unusual Fire and Explosion Hazards
HIGH TEMPERATURE FIRE CAN GENERATE HCL, PHOSGENE OR PRODUCTS OF PARTIAL OXIDATION OF THIS PESTICIDE.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES. Skin? READILY ABSORBED THROUGH THE INTACT SKIN. Ingestion? ORAL DOSE IN MAN CAUSING CONVULSIONS ESTIMATED AT ABOUT 0.2 MG/KG.

Health Hazards (*Acute and Chronic*)

ORAL LD50 IN THREE ANIMAL SPECIES

RANGED FROM 1.4 - 3.0 MG/KG.

Carcinogenicity: NTP? NO CURRENT DATA. IARC Monographs? POSSIBLE ANIMAL CARCINOGEN BASED ON ITS CHEMICAL SIMILARITY TO DIELDRIN. OSHA Regulated?

Signs and Symptoms of Exposure

CNS EFFECTS ACUTELY, AND LIVER IMPACTS CHRONICALLY AT LOWER LEVELS.

Medical Conditions Generally Aggravated by Exposure

Emergency and First Aid Procedures

INHAL - REMOVE FROM EXPOSURE - TREAT SYMPTOMATICALLY AND REFER TO PHYSICIAN - EYE - FLUSH OUT W/WATER FOR 15 MIN. DERMAL CONTACT - REMOVE IMMEDIATELY BY THOROUGH WASHING W/SOAP AND WATER MEDICAL FOLLOW-UP WARRANTED IF MAJOR SKIN CONTACT OCCURS

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

CONTAIN BY ABSORPTION ON CLAY OR SIMILAR MATERIAL. DO NOT FLUSH INTO FLOOR OR STORM DRAINS NOR ONTO SOIL SURFACES

Waste Disposal Method

ABSORBED MATERIAL DEPENDING ON CONCENTRATION AND AMOUNT - MUST BE DISPOSED AS DETAILED IN THE EPA FIFRA REGULATIONS.

Precautions to Be Taken in Handling and Storing

STORE IN COOL, WELL-VENTILATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS.

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)

WHERE LEVELS APPROACH OR EXCEED THE TLV MINIMALLY A CHARCOAL CARTRIDGE HALF-FACE RESPIRATOR WOULD BE NEEDED.

Ventilation			
	Local Exhaust: NOT TYPICALLY USED INDOORS	Special	
	Mechanical (General): NOT APPLICABLE	Other	

Protective Gloves	Eye Protection
HEAVY RUBBER OR NITRITE	SFETY GLASSES WITH SIDE SHIELDS

Other Protective Clothing or Equipment

COVERALLS OR DISPOSABLE TYVEK WHERE CLOTHING OR SKIN CONTAMIANTION ARE LIKELY

Work/Hygienic Practices

REMOVE CONTAMINATED OUTER GARMENTS AND THOROUGHLY WASH HANDS/FACE OR ANY EXPOSED SKIN. A SHOWER IS REOCMMENDED AT LEAST ONCE DAILY AFTER HANDLING THIS TYPE OF INDUSTRIAL CHEMICAL.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

ENTITY (As Used on Label and List)	Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that
DIELDRIN	

Section I

Manufacturer's Name	Emergency Telephone Number
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
	Date Prepared: 7/28/95
	Signature of Preparer (optional): A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
DIELDRIN (PESTICIDE) NO LONGER MANUFACTURED IN THE U.S. A 12 CARBON HEXACHLORO DERIVATIVE OF NAPHTHLENE		0.25 MG/M3		

Section III — Physical/Chemical Characteristics

Boiling Point: DECOMPOSES ON BOILING		Specific Gravity (H_2O = 1)	1.2
Vapor Pressure (mm Hg): 3.1 X 10^{-7} MM/HG AT 68 DEGREES	F.	Melting Point	176 DEGREES C
Vapor Density (AIR = 1): 12+		Evaporation Rate (Butyl Acetate = 1)	NEG.

Solubility in Water: VERY SLIGHTLY SOLUBLE

Appearance and Odor: VERY SLIGHT HYDROCARBON ODOR

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
300 DEGREES + COC			

Extinguishing Media: CO2 FOAM, DRY CHEM,WATER

Special Fire Fighting Procedures: NOT READILY COMBUSTIBLE BUT IN A FIRE BOTH DIELDRIN, HCL AND PHOSGENE WOULD BE AIRBORNE IN SIGNIFICANT HEALTH EFFECTS CONCENTRATION

Unusual Fire and Explosion Hazards: WATER USAGE SHOULD BE LIMITED BECAUSE OF POTENTIAL ADVERSE IMPACTS ON RECEIVING WATERS AND FISH OR WILDLIFE.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STORE AWAY FROM STRONG OXIDIZERS

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts
HCL AND PHOSGENE PLUS PRODUCTS OF PARTIAL OXIDATION

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry Inhalation? ACUTE AND CHRONIC Skin? ACUTE ABSORPTION Ingestion? HIGHLY TOXIC

Health Hazards (*Acute and Chronic*)
ACUTE LD50 RODENTS 38-75 MG/KG INHALATION OVEREXPOSURE IN MAN CAN RESULT IN CENTRAL NERVOUS SYSTEM EFFECTS ACUTELY OR CHRONICALLY. LIVER IMPACTS ARE SECONDARY. THIS COMPOUND ABSORBS READILY THROUGH THE SKIN.

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?
YES IN ANIMALS AND SUSPECTED IN MAN.

Signs and Symptoms of Exposure
FIRST NAUSEA, HYPER IRRITABILITY, HEADACHE, MUSCLE SPASM AND POSSIBLE CONVULSION WITH SUSTAINED HIGH SYSTEMIC DOSES BY THE INHALATION, DERMAL OR ORAL ROUTES OF EXPOSURE.

Medical Conditions Generally Aggravated by Exposure CNS, OR LIVER FUNCTION

Emergency and First Aid Procedures
EYES FLUSHED WITH WATER FOR 15 MINUTES AND CONSULT PHYSICIAN. ORAL - INDUCE VOMITING AND IMMEDIATELY REFER TO POISON CONTROL CENTER. INHAL - REMOVE FROM EXPOSURE. TREAT SYMPTOMATICALLY AND REFER FOR MEDICAL TREATMENT/EVALUATION. DERMAL - REMOVE CONTAMINATED CLOTHING AND THE MATERIAL FROM THE SKIN WITH SOAP/WATER. FOLLOW W/MEDICAL CONSULTATION.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
CONTAIN BY ABSORPTION ON CLAY OR SIMILAR MATERIAL. DO NOT FLUSH INTO FLOOR OR STORM DRAINS NOR ONTO SOIL SURFACES

Waste Disposal Method
ABSORBED MATERIAL DEPENDING ON CONCENTRATION AND AMOUNT - MUST BE DISPOSED AS DETAILED IN THE EPA REGULATIONS.

Precautions to Be Taken in Handling and Storing
STORE IN COOL, WELL-VENTILATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS.

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
WHERE LEVELS APPROACH OR EXCEED THE TLV MINIMALLY A CHARCOAL CARTRIDGE HALF-FACE RESPIRATOR WOULD BE NEEDED.

Ventilation			
	Local Exhaust: THIS CHEMICAL IS NOT TYPICALLY USED INDOORS	Special	
	Mechanical (General): NOT APPLICABLE	Other	

Protective Gloves: HEAVY RUBBER OR NITRILE GLOVES.
Eye Protection: SAFETY GLASSES WITH SIDE SHIELDS

Other Protective Clothing or Equipment
COVERALLS OR DISPOSABLE TYVEK WHERE CLOTHING OR SKIN CONTAMINATION ARE LIKELY.

Work/Hygienic Practices
REMOVE CONTAMINATED OUTER GARMENTS AND THOROUGHLY WASH HANDS AND FACE OR ANY EXPOSED SKIN. A SHOWER IS RECOMMENDED AT LEAST ONCE DAILY AFTER HANDLING THIS TYPE INDUSTRIAL CHEMICAL.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
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OMB No. 1218-0072

IDENTITY (As Used on Label and List)
HEPTACHLOR

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that

Section I

Manufacturer's Name
NO LONGER MANUFACTURED FOR USE IN THE

Emergency Telephone Number

Address (Number, Street, City, State, and ZIP Code)
U.S.

Telephone Number for Information

Date Prepared
7/31/95

Signature of Preparer (optional)
A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
		0.5 MG/M3 *		
1,4,5,6,7,8,8' HEPTACHLORO				
3,4,7,7' TETRA HYDRO METHANOINDANE				
HEPTACHLOR OR HEPTAGRAM, ETC. A CHLORINATED PESTICIDE				

*READILY ABSORBED THROUGH THE INTACT SKIN

Section III — Physical/Chemical Characteristics

Boiling Point: 135 - 145 DEGREES C		Specific Gravity (H_2O = 1): 1.2	
Vapor Pressure (mm Hg): 3 X 10^{-4} MM/HG AT 68 DEGREES F		Melting Point: 96 DEGREES C	
Vapor Density (Air = 1): 8 PLUS		Evaporation Rate (Butyl Acetate = 1): NEG	

Solubility in Water
INSOLUBLE

Appearance and Odor
FAINT CHEMICAL ODOR

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
OVER 300 DEGREES F COC			

Extinguishing Media
CO2 FOAM, DRY CHEM, WATER

Special Fire Fighting Procedures
WATER NOT RECOMMENDED WHERE THE COMPOUND MAY REACH STREAMS OR RESULT IN SOIL OR GROUND WATER CONTAMINATION

Unusual Fire and Explosion Hazards
AT HIGHER TEMPERATURE THE COMPOUND IS VOLATILE AND CAN RESULT IN PRONOUNCED CNS EFFECTS SUCH AS CONVULSIONS. HCL AND PHOSGENE CAN ALSO BE GENERATED.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES. HIGHLY TOXIC IN SMALL QUANTITIES AS DUSTS OR MISTS. Skin? YES. READILY ABSORBED THROUGH INTACT SKIN W/SUSTAINED CONTACT. Ingestion? ORALLY TOXIC RAT LD50 40-188 MG/KG.

Health Hazards (*Acute and Chronic*)

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?
SUSPECTED CARCINOGEN IN ANIMALS.

Signs and Symptoms of Exposure
CNS EFFECTS ACUTELY. LIVER OR IMPACTS CHRONICALLY AT LOWER CONCENTRATIONS.

Medical Conditions Generally Aggravated by Exposure: LIVER DISEASE.

Emergency and First Aid Procedures
EYES: FLUSH W/WATER 15 MIN.-CONSULT PHYSICIAN. ORAL: INDUCE VOMITING-IMMEDIATELY REFER TO POISON CONTROL CENTER. INHAL: REMOVE FROM EXPOSURE. TREAT SYMPTOMATICALLY-REFER FOR MEDICAL TREATMENT/EVALUATION. DERMAL: REMOVE MATERIAL WITH SOAP/WATER FOLLOWED BY MEDICAL CONSULTATION

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
CONTAIN BY ABSORPTION ON CLAY OR SIMILAR MATERIAL. DO NOT FLUSH INTO FLOOR OR STORM DRAINS NOR ONTO SOIL SURFACES.

Waste Disposal Method
ABSORBED MATERIAL DEPENDING ON CONCENTRATION AND AMOUNT - MUST BE DISPOSED AS DETAILED IN THE EPA REGULATIONS.

Precautions to Be Taken in Handling and Storing
STORE IN COOL, WELL-VENTILATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS.

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
WHERE LEVELS APPROACH OR EXCEED THE TLV MINIMALLY A CHARCOAL CARTRIDGE HALF-FACE RESPIRATOR WOUL BE NEEDED.

Ventilation		
Local Exhaust: NOT TYPICALLY USED EXCEPT FOR INDOOR APPLICATION.	Special	
Mechanical (General): NOT APPLICABLE.	Other	

Protective Gloves: HEAVY RUBBER OR NITRITE.

Eye Protection: SAFETY GLASSES WITH SIDE SHIELDS.

Other Protective Clothing or Equipment
COVERALLS OR DISPOSABLE TYVEK WHERE CLOTHING OR SKIN CONTAMINATION ARE LIKELY.

Work/Hygienic Practices
REMOVE CONTAMINATED OUTER GARMENTS AND THOROUGHLY WASH HANDS/FACE OR ANY EXPOSED SKIN.
SHOWER IS RECOMMENDED AT LEAST DE DAILY AFTER HANDLING THIS TYPE INDUSTRIAL CHEMICAL.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
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Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that

Section I

Manufacturer's Name
NO LONGER MANUFACTURED IN THE U.S.

Emergency Telephone Number

Address (Number, Street, City, State, and ZIP Code)

Telephone Number for Information

Date Prepared
7/31/95

Signature of Preparer (optional)
A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
1,1 DICHLORO				
2,2 BIS (CHLOROPHENYL) ETHANE				
A CHLORINATED PESTICIDE COMPONENT OF DDT AND FORMERLY SOLD AS RHOTHANE				
AND OTHER TRADE NAMES.				
NO OFFICIAL TLV.				
THE DDT LIMIT WOULD BE AN				
APPROPRIATE CONSERVATIVE GUIDELINE.				

Section III — Physical/Chemical Characteristics

Boiling Point: ESTIMATED AT OVER 350°F		Specific Gravity (H_2O = 1)	ESTIMATED AT 1.5
Vapor Pressure (mm Hg): LESS THAN 1 X 10^5 MM/HG AT 68 DEGREES F		Melting Point	N.A
Vapor Density (AIR = 1): GREATER THAN 8		Evaporation Rate (Butyl Acetate = 1)	NEGLIGIBLE

Solubility in Water
INSOLUBLE

Appearance and Odor
FAINT CHLORINATED HYDROCARBON ODOR IN CONCENTRATED FORM

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
IN EXCESS OF 300 DEGREES F COC	NA		

Extinguishing Media
CO2, FOAM DRY CHEM, OR WATER

Special Fire Fighting Procedures
AVOID USE OF WATER WHERE IT WILL IMPACT ON RECEIVING STREAMS OR SOILS ADJACENT

Unusual Fire and Explosion Hazards
CAN GENERATE PHOSGENE AND HCL PLUS TOXIC PRODUCTS OF PARTIAL COMBUSTION AND

THE PESTICIDE AS AIRBORNE VAPORS

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS

Incompatibility (Materials to Avoid)

Hazardous Decomposition or Byproducts
ONLY OCCURS FROM FIRES OR CHEMICAL OXIDATION REACTIONS

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry Inhalation? TOXIC BY INHAL AS DUST OR Skin? DERMAL LD50 IN Ingestion? RAT ORAL LD50 113 MG/KG

Health Hazards (Acute and Chronic) SPRAY MIST. RABBITS 1200 MG/KG

DERMAL ABSORPTION IS A PRIMARY CONCERN WITH REPEATED EXPOSURE INCIDENTS.

Carcinogenicity: NTP? THIS COMPOUND IS CLASSIFIED AS AN ANIMAL CARCINOGEN, IT IS A IARC Monographs? OSHA Regulated? NO

WEAK MUTAGEN AND RESULTS IN TUMORS IN AT LEAST TWO SPECIES.

Signs and Symptoms of Exposure
NO ACUTE INDICATIONS OF SERIOUS HEALTH EFFECTS FROM EXPERIENCE IN MAN. IN ANIMALS AT HIGH DOSE, LIVER AND CNS EFFECTS ALSO OCCUR.

Medical Conditions
Generally Aggravated by Exposure NONE KNOWN

Emergency and First Aid Procedures
EYES: FLUSH W/WATER 15 MIN. FOLLOW-UP ANTICIPATED AS NEEDED

ORAL: INDUCE VOMITING AND REFER TO PHYSICIAN FOR SYMPTOMATIC SUPPORT TREATMENT

Section VII — Precautions for Safe Handling and Use

INHAL - REMOVE FROM EXPOSURE - HIGH LEVELS ONLY ANTICIPATED BY THIS ROUTE IN FIRES DERMAL: WASH

Steps to Be Taken in Case Material Is Released or Spilled
ABSORB WITH CLAY OR SIMILAR MATERIALS. CONTAMINATED AREAS WITH SOAP/WATER.

FOR DISPOSAL AS SPECIFIED IN THE EPA CONSULT PHYSICIAN FOR FOLLOW-UP

REGULATIONS FOR PESTICIDES.

Waste Disposal Method

Precautions to Be Taken in Handling and Storing
AVOID SKIN CONTACT. STORE IN DRY COOL WELL-VENTILATED AREA.

Other Precautions

Section VIII — Control Measures

Respiratory Protection (Specify Type)
ONLY APPLICABLE FOR THE PURE COMPOUND WHERE SPRAYING OR SIMILAR TASKS ARE DONE

Ventilation		
	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves
RUBBER OR EQUIVALENT MATERIALS

Eye Protection

Other Protective Clothing or Equipment
COVERALLS OR TYVEK WHERE SKIN OR CLOTHING CONTAMINATION MAY OCCUR

Work/Hygienic Practices
MINIMAL THOROUGH WASHING OF HANDS AND FACE AFTER HANDLING THE MATERIAL TO PRECLUDE SKIN ABSORPTION AND/OR INCIDENTAL INGESTION.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

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Section I

Manufacturer's Name NO LONGER MANUFACTURED IN THE U.S.	Emergency Telephone Number
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
NA	Date Prepared 7/31/95
	Signature of Preparer (optional) A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
1,1 DICHLORO 2,2 BIS CHLOROPHENYL ETHYLENE (DDE)				
NO OFFICIAL OCCUPATIONAL LIMIT, THE DDT LIMIT OF 1.0 MG/M3 IS A RECOMMENDED GUIDELINE.				

Section III — Physical/Chemical Characteristics

Boiling Point ESTIMATED OVER	350°F	Specific Gravity (H_2O = 1) ESTIMATED AT	1.4
Vapor Pressure (mm Hg) LESS THAN 1 X 10^5 MM/HG AT 68	DEGREES F	Melting Point	UNKNOWN
Vapor Density (AIR = 1) GREATER THAN 8		Evaporation Rate (Butyl Acetate = 1) NEGLIGIBLE	

Solubility in Water
INSOLUBLE

Appearance and Odor
FAINT CHLORINATED HYDROCARBON ODOR IN CONCENTRATED FORM

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)		Flammable Limits	LEL	UEL
IN EXCESS OF 300 DEGREES F	COC	NA		

Extinguishing Media
CO2, FOAM DRY CHEM OR WATER

Special Fire Fighting Procedures
AVOID USE OF WATER WHERE IT WILL IMPACT ON RECEIVING STREAMS OR SOILS AND GROUNDWATER ADJACENT.

Unusual Fire and Explosion Hazards
CAN GENERATE PHOSGENE AND HCL PLUS TOXIC PRODUCTS OF PARTIAL OXIDATION THE PESTICIDES AS AIRBORNE VAPORS

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts
ONLY OCCURS FROM FIRES OR CHEMICAL OXIDATION REACTIONS

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? TOXIC BY INHALATION AS A DUST OR VAPOR. Skin? DERMAL LD50 EST AT 2000 MG/KG IN RABBITS. Ingestion? RAT LD50 880 MG/KG

Health Hazards (*Acute and Chronic*)

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?
LIMITED EVIDENCE OF CARCINOGENICITY IN TWO EXPERIMENTAL ANIMAL SPECIES.

Signs and Symptoms of Exposure
LIMIT ACUTE INDICATIONS OF EXPOSURE FROM EXPERIENCE IN MAN. IN ANIMALS AT HIGH DOSE, LIVER AND CNS EFFECTS OCCUR

Medical Conditions Generally Aggravated by Exposure: NONE KNOWN

Emergency and First Aid Procedures
EYES: FLUSH W/WATER 15 MIN.-FOLLOW-UP ANTICIPATED AS NEEDED. ORAL: INDUCE VOMITING AND REFER TO PHYSICIAN FOR SYMPTOMATIC SUPPORT TREATMENT. INHAL: REMOVE FROM EXPOSURE - HIGH LEVELS ONLY ANTICIPATED BY THIS ROUTE IN FIRES. DERMAL: WASH CONTAMINATED AREAS WITH SOAP/WATER - CONSULT PHYSICIAN FOR FOLLOW-UP.

ction VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
ABSORB WITH CLAY OR SIMILAR MATERIALS

FOR DISPOSAL AS SPECIFIED IN THE EPA REGULATIONS FOR THIS CLASS OF PESTICIDES.

Waste Disposal Method

Precautions to Be Taken in Handling and Storing
AVOID SKIN CONTACT. STORE IN DRY COOL WELL-VENTILATED AREA

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
ONLY APPLICABLE FOR THE PURE COMPOUND WHERE SPRAYING OR SIMILAR TASKS ARE DONE

Ventilation		
	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves: RUBBER OR EQUIVALENT
Eye Protection:

Other Protective Clothing or Equipment
COVERALLS OR TYVEK WHERE SKIN OR CLOTHING CONTAMINATION MAY OCCUR

Work/Hygienic Practices
MINIMALLY THOROUGH WASHING OF HANDS/FACE AFTER HANDLING THE MATERIAL TO PRECLUDE SKIN ABSORPTION AND/OR INCIDENTAL INGESTION.

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

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Occupational Safety and Health Administration
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Form Approved
OMB No. 1218-0072

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Section I

Manufacturer's Name NOT CURRENTLY MANUFACTURED IN THE U.S.	Emergency Telephone Number
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
N/A	Date Prepared 7/31/95
	Signature of Preparer (optional) A.S.TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
1,2,3,4,10,10 HEXACHLORO		0.25 MG/M3*		
1,4,4,588 HEXAHYDRO				
1,4,58 DIMETHANO NAPHTHALENE				
(A CONTACT AND SYSTEM PESTICIDE)				

*ABSORBS READILY THROUGH INTACT SKIN

Section III — Physical/Chemical Characteristics

Boiling Point OVER 300 DEGREES F. (DECOMPOSES)	Specific Gravity (H_2O = 1) APPROXIMATELY 1, 3
Vapor Pressure (mm Hg) 6 X 10^{-6} HH/HG AT 68 DEGREES F.	Melting Point 104 DEGREES C
Vapor Density (AIR = 1) 10 PLUS	Evaporation Rate (Butyl Acetate = 1) NEGATIVE

Solubility in Water
INSOLUBLE

Appearance and Odor
FAINT TO MILD CHLORINATED HYDROCARBON CHEMICAL ODOR

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
OVER 300 COC	N.A.		

Extinguishing Media
CO2 FOAM, DRY CHEM OR WATER

Special Fire Fighting Procedures
CO2 IS RECOMMENDED TO PERMIT EASE OF CLEANUP AND DECONTAMINATION AND TO AVOID SEWER, STREAM, GROUNDWATER OR OTHER ADVERSE IMPACTS.

Unusual Fire and Explosion Hazards
CAN GENERATE ALDRIN VAPORS IN ADDITION TO HCL, PHOSGENE OR PRODUCTS OF PARTIAL PYROLYSIS.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts
HCL AND PHOSGENE

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES; Skin? READILY ABSORBED; Ingestion? LD50 RATS 60 MG/KG

Health Hazards (*Acute and Chronic*)
SIMILAR TO DIELDRIN. CNS & LIVER IMPACTS POSSIBLE WITH OVEREXPOSURE BY BOTH INHALATION OF THE SPRAY OR MIST AND DERMAL ABSORPTION

Carcinogenicity: NTP? SUSPECTED ANIMAL CARCINOGEN; IARC Monographs?; OSHA Regulated? NO

Signs and Symptoms of Exposure
ACUTELY CNS EFFECTS AND LIVER IMPACTS CHRONICALLY

Medical Conditions Generally Aggravated by Exposure: LIVER OR KIDNEY DISEASE

Emergency and First Aid Procedures
EYES FLUSHED WITH WATER FOR 15 MIN & CONSULT PHYSICIAN. ORAL - INDUCE VOMITING AND IMMEDIATELY REFER TO POISON CONTROL CTR. INHAL - REMOVE FROM EXPOSURE. TREAT SYMPTOMATICALLY AND REFER FOR MEDICAL TREATMENT/EVALUATION. DERMAL - REMOVE MATERIAL W/SOAP+WATER FOLLOWED BY MEDICAL CONSULTATION

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
CONTAIN BY ABSORPTION ON CLAY OR SIMILAR MATERIAL. DO NOT FLUSH INTO FLOOR OR STORM DRAINS NOR ONTO SOIL SURFACES

Waste Disposal Method
ABSORBED MATERIAL DEPENDING ON CONCENTRATION AND AMOUNT - MUST BE DISPOSED AS DETAILED IN THE EPA REGULATIONS.

Precautions to Be Taken in Handling and Storing
STORE IN COOL, WELL-VENTILATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
WHERE LEVELS APPROACH OR EXCEED THE TLV MINIMALLY A CHARCOAL CARTRIDGE HALF-FACE RESPIRATOR WILL BE NEEDED.

Ventilation		
	Local Exhaust: THIS COMPOUND IS NOT TYPICALLY USED WHERE LOCAL EXHAUST IS FEASIBLE	Special
	Mechanical (General): NOT APPLICABLE	Other

Protective Gloves	Eye Protection
HEAVY RUBBER OR NITRITE	SAFETY GLASSES WITH SIDE SHIELDS

Other Protective Clothing or Equipment
COVERALLS OR DISPOSABLE TYVEK WHERE CLOTHING OR SKIN CONTAMINATION ARE LIKELY

Work/Hygienic Practices
REMOVE CONTAMINATED OUTER GARMENTS AND THOROUGHLY WASH HANDS, FACE, ANY EXPOSED SKIN. SHOWER IS RECOMMENDED AT LEAST ONCE DAILY AFTER HANDLING THIS TYPE INDUSTRIAL CHEMICAL.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
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Form Approved
OMB No. 1218-0072

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Section I

Manufacturer's Name	Emergency Telephone Number
UNKNOWN	
Address (Number, Street, City, State, and ZIP Code)	Telephone Number for Information
	Date Prepared: 7/31/95
	Signature of Preparer (optional): A.S. TODD

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
2,4,5 TRICHLORO PHENOXY ACETIC ACID (WEEDONE)	OSHA LIMIT 10 MG/M3			

Section III — Physical/Chemical Characteristics

Boiling Point: ESTIMATED	540°F	Specific Gravity (H_2O = 1)	1.15
Vapor Pressure (mm Hg):	NEG.	Melting Point	138°C
Vapor Density (AIR = 1):	7+	Evaporation Rate (Butyl Acetate = 1): NEGLIGIBLE	

Solubility in Water: VERY SLIGHTLY SOLUBLE

Appearance and Odor: FAINT CHLORINATED HYDROCARBON ODOR

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
IN EXCESS OF 250 DEGREES COC	NA		

Extinguishing Media: CO2 FOAM, DRY CHEM, OR WATER

Special Fire Fighting Procedures: MINIMIZE USE OF WATER TO PRECLUDE ADVERSE IMPACT ON RECEIVING WATER AND SOIL AND GROUNDWATER CONTAMINATION.

Unusual Fire and Explosion Hazards: THIS COMPOUND CAN DECOMPOSE TO FORM HCL AND PHOSGENE PLUS OTHER BY-PRODUCTS OF POTENTIAL COMBUSTION.

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	STRONG OXIDIZERS OR CAUSTICS.

Incompatibility (*Materials to Avoid*)

Hazardous Decomposition or Byproducts

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES, THROAT/LUNG IRRITATION Skin? LIMITED INDICATIONS Ingestion? LD50 VARIES WITH SPECIES

Health Hazards (*Acute and Chronic*) WEIGHT LOSS AND OF DERMAL EFFECTS FROM 100-1000 MG/KG
EXCEPT MINOR IRRITATION.
POSSIBLE KIDNEY IMPACTS
AT HIGHER AIRBORNE LEVELS CHRONICALLY.

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?
NO DATA SUGGESTING CARCINOGENICITY IN MAN OR ANIMALS.

Signs and Symptoms of Exposure
EYE, THROAT AND UPPER RESPIRATORY BURNING SENSATION.

Medical Conditions Generally Aggravated by Exposure: LIVER OR KIDNEY DISEASE.

Emergency and First Aid Procedures
FLUSH EYES OUT FOR 15 MIN. WHERE CONTACT OCCURS. REMOVE MATERIALS FROM SKIN USING LIBERAL WASHING W/SOAP/WATER. REMOVE FROM EXPOSURES TO MISTS IF GENERATED AND TREAT SYMPTOMATICALLY.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
SORB WITH CLAY, CARBON OR RELATED CHEMICAL ABSORBANTS. . . .

Waste Disposal Method
EPA APPROVED LANDFILLS OR INCINERATION DEPENDING ON AMOUNTS AND CONCENTRATION.

Precautions to Be Taken in Handling and Storing
STORE IN COOL, DRY, VENTILATED AREA

Other Precautions

Section VIII — Control Measures

Respiratory Protection (*Specify Type*)
NIOSH APPROVED WITH PESTICIDE CARTRIDGES

Ventilation		
	Local Exhaust: NOT APPLICABLE EXCEPT FOR BLENDING OR SPRAYING OPERATIONS.	Special
	Mechanical (General)	Other
Protective Gloves		Eye Protection

Other Protective Clothing or Equipment
FULL BODY (TYVEK) OR OTHER OUTER CLOTHING WHEN CLEANING UP SPILLS OR WASTE

Work/Hygienic Practices
GOOD PERSONAL HYGIENE REQUIRED TO PRECLUDE EYE AND SKIN EFFECTS AND INCIDENTAL INGESTION.

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VELS

VELSICOL CHEMICAL CORPORATION
10400 WEST HIGGINS ROAD
ROSEMONT, IL 60018

MATERIAL SAFETY DATA SHEET FOR:

TECHNICAL CHLORDANE

EMERGENCY TEL. NO. 708-298-9000 **Date:** 8/92

MATERIAL IDENTIFICATION

Chemical Identity	Octachlorohexahydro-4,7-methanoindene and related compounds. (CAS RN: 12789-03-6)
Synonyms	Technical octachloro-4,7-methanotetrahydroindane; chlordane
Chemical Family	Chlorinated cyclodiene adduct
DOT Classification	Flammable Liquid NA 2762
OSHA Hazardous Ingredients	Chlordane 100% (technical).

HEALTH ALERT AND FIRST AID

Warning: **May be fatal if swallowed. Irritating in eyes.**

In Eyes	Flush eyes with water for at least 15 minutes. Get medical attention.
On Skin	Wash several times with mild soap and water, rinsing thoroughly. Remove contaminated clothing immediately. Consult a physician.
Ingested	Drink large amount of water. Induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person. Get medical attention.
Inhaled	Remove to fresh air. Apply artificial respiration, if necessary. Consult a physician.
Note to Physician	For ingestion, lavage stomach with 2-4 liters of tap water. Instill 30 gm of activated charcoal in 3-4 oz. of water. Sodium sulfate cathartic. Use anticonvulsants in appropriate dosages repeated as necessary. Watch breathing closely, aspirate, oxygen and/or ventilatory support if needed. Avoid oils, oil laxatives, epinephrin (adrenalin) and sudden physical stimuli. Do not give stimulants.

In All Cases of Emergency, Contact a Physician

FIRE AND EMERGENCY EXCURSION INFORMATION ON NEXT PAGE

FIRE AND EXPLOSION INFORMATION

Explosive Limits (% by volume)	Lower: 2.8 Upper: 30.5
Flammability	Flammable.
Flash Point	95°F Pensky-Martin, non-sustained.
Fire Extinguishing Media	Halon, fog or water spray, foam, carbon dioxide, ABC dry chemical.
Special Protective Equipment	If fire involves the Technical Chlordane, wear full protective clothing and self-contained breathing apparatus.
Special Fire Fighting Procedures	Cool drums with water and remove when possible. If spill has ignited, use water spray when protecting persons stopping the source; use water sparingly so that spill can be contained.
Products of Combustion	May yield HCl, organochlorides, oxides of nitrogen, carbon monoxide and carbon dioxide.
Unusual Fire and Explosion Hazards	None (typical drum fire hazards).

REACTIVITY

Unusual Reactive Conditions	None.

SPILL INFORMATION

Control and Clean-up	Contain spill and absorb with clay granules, sawdust or equivalent. Collect in drums. Area can be washed down with water and detergent to remove remaining insecticide. DO NOT ALLOW WASHINGS IN SEWER.
Absorbents	Clay granules, sawdust or dirt.
Counteractants	Not applicable.
Incompatibles	Strong oxidizing agents.
CERCLA Reportable Quantity	1 pound (0.45 kilogram).

HANDLING, STORAGE AND DISPOSAL

Special Precautions Maintain adequate ventilation. Do not breathe vapors. Maintain secure restraints on containers when handling. Do not get on skin or clothing.

Personal Protective Equipment Where inhalation is likely, wear a MSHA/NIOSH-approved respirator for pesticides. Where eye and skin contact is likely, use chemical goggles or face shield, impermeable gloves, and clean body-covering clothing.

Exposure Limits OSHA PEL: 0.5 mg/m³ (skin).
ACGIH TLV: 0.5 mg/m³ (skin).

NFPA Rating Health: 1, Fire: 2, Reactivity: 1, Special Properties: None

Storage Store in dry, well-ventilated area away from sources of ignition. Do not store with food or feedstuffs.

Waste Disposal Controlled incineration in accordance with applicable regulatory permits.

PHYSICAL AND CHEMICAL INFORMATION

Chemical Formula Not applicable.

Appearance and Odor Amber, viscous liquid. Slightly pungent chlorine-like odor.

Molecular Weight Not applicable

Boiling Point 349°F @2 mmHg. Decomposes before boiling at atmospheric conditions.

Vapor Pressure 1×10^{-5} mmHg at 25°C (77°F).

Vapor Density 13.2 (Air = 1)

Specific Gravity 1.63 at 25°C (H_2O = 1)

Solubility Insoluble in water. Miscible in xylene, alcohols, chlorinated solvents.

Evaporation Rate >2.0 (Toluene = 1).

Stability Stable.

Reactivity Slowly dehydrohalogenates in strong alkali.

Decomposition Products None known.

TECHNICAL AND SUPPORTING INFORMATION

HEALTH HAZARD INFORMATION

Primary Route(s) of Entry	ORAL: No, Inhalation: Yes, Dermal/Eye: Yes
Listed as Possibly Carcinogenic by	IARC (Inadequate evidence in humans; sufficient evidence in animals).
Signs and Symptoms of Acute Overexposure	Ingestion or gross dermal exposure may cause[1] convulsions, confusion, incoordination, excitability, or coma. In eyes, may cause[2] irritation. [1]Based on acute poisoning cases and animal studies. [2]Based on results in animal studies.
Acute Toxicity: Oral	LD_{50} in rats has been reported as low as 133 mg/kg and as high as 649 mg/kg.
Dermal	LD_{50} in rabbits is greater than 200 mg/kg but <2000 mg/kg.
Inhalation	LC_{50} in rats (4 hr.) has been reported as low as 0.1 mg/l, however, in a repeated dose study, mortality occurred after several 8 hr. exposures at 0.15 mg/l. Further, in a 90-day study no mortality occurred at 0.01 mg/l (8 hrs. 5 days/week). This suggests an LC_{50} between 0.15 and 0.5 mg/l.

OTHER TOXICOLOGICAL INFORMATION

Eye Irritation	Irritating to the eye of rabbits.
Skin Irritation	Not a primary skin irritant to rabbits.
Skin Sensitization	Not a sensitizer in guinea pigs.
Mutagenicity	In general, mutagenicity tests indicate that the substance is not mutagenic, although some positive results have been reported in individual tests.
Subchronic and Chronic Toxicity	Technical chlordane has been studied in laboratory animals for subchronic, chronic, reproductive, teratogenic and oncogenic effects. The central nervous system and liver appear to be the target organs. The lowest observed effect level (LOEL) with chronic ingestion exposure (liver effects) in animals appears to be about 5 ppm. Liver tumors were observed in certain strains of laboratory rodents in long-term feeding studies, but there were differences of opinion as to whether lesions were evidence of carcinogenicity.

REGULATORY INFORMATION

FIFRA	Registered pesticide.
CERCLA	Regulated. Reportable quantity 1 lb. (0.45kg).
RCRA	Hazardous waste when disposed.
CWA	Regulated.
SARA 302	Subject to reporting requirements of 40CFR 355.
SARA 311 AND 312	Subject to reporting requirements of 40CFR 370 categories listed below: -Immediate (acute) health. -Delayed (chronic) health.
SARA 313	Components subject to reporting requirements of 40CFR 372: Chlordane (technical) (listed under CASRN 57-74-9): 100%

John

New York State Department of Environmental Conservation

MEMORANDUM

TO: Michael J. Cruden, West Field Services, BCS, DER
FROM: John R. Strang, O&M Section, BHSC, DER
SUBJECT: Almy Brothers Site, #7-04-021, Broome County

DATE: September 2, 1997

I have reviewed the document entitled "Monitoring and Maintenance Manual for the Almy Brothers Site" and have the following comments:

- 1.1 Project Description. Replace the last sentence with "The remedy was completed in September 1997 and the site is in the monitoring and maintenance phase."

- 4.3 Evaluation of Monitoring Reports. Replace the last sentence with "As we remove monitoring wells from the monitoring network, we should properly decommission them following the NYSDEC Groundwater Monitoring Well Decommissioning Procedures, October 1996."

- 5.2 Inspection and Maintenance. The site should have an inspection form (as an example I attach Table 5-1 marked up). On the reverse side of the inspection form should be a map of the site that includes the location of the monitoring wells. The new monitoring well needs to be added to the site map (Figure 2.2) Also attached is a Groundwater Sampling Log Sheet to be included as Figure 4-3 for use during the groundwater sampling.

- 6.1.1 Emergency Contacts. Change the NYSDEC - Albany Office telephone number to 518-457-0927.

- Appendix B. Include the boring log for the just installed monitoring well.

If you have any questions, please call me at 457-0927.

John R. Strang
Project Engineer

Attachments

cc: C. Branagh, Reg. 7
T. Suozzo, Reg. 7
J. May, Reg. 7
G. Rider

a:704021.om

APPENDIX
Almy Brothers Site #7-04-021
GROUNDWATER SAMPLING LOG SHEET

PAGE _____ OF _____

DATE

SAMPLE LOCATION ID

LOCATION ACTIVITY START END

FIELD QC DATA: ☐ FIELD DUPLICATE COLLECTED DUP ID_____

WATER LEVEL / WELL DATA

WELL DEPTH FT ☐ MEASURED ☐ HISTORICAL ☐ TOP OF WELL ☐ TOP OF CASING ☐ _____

PROTECTIVE CASING STICK-UP (FROM GROUND) FT

PROTECTIVE CASING/WELL DIFF. FT

DEPTH TO WATER FT

HISTORICAL WELL DEPTH FT

WELL DIA. ☐ 2 INCH ☐ 4 INCH ☐ 6 INCH ☐ _____

WELL MATERIAL: ☐ PVC ☐ SS ☐ _____

WELL INTEGRITY:	YES	NO	N/A
PROT. CASING SECURE	☐	☐	☐
CONCRETE COLLAR INTACT	☐	☐	☐
WELL LOCKED	☐	☐	☐

OTHER:_____

HEIGHT OF WATER COLUMN FT X ☐ .16 GAL/FT (2 IN) ☐ .65 GAL/FT (4 IN)= ☐ 1.5 GAL/FT (6 IN) ☐ ___ GAL/FT (__IN)

GAL/VOL

TOTAL GAL PURGED

AMBIENT AIR VOA PPM

WELL MOUTH PPM

PURGE DATA

PURGE VOLUME	@_____GAL	@_____GAL	@_____GAL	@_____GAL	@_____GAL
TEMP, DEG C					
pH, UNITS					
SPECIFIC CONDUCTIVITY umhos/cm					
_____					

SAMPLE OBSERVATIONS
☐ CLEAR
☐ COLORED_____
☐ CLOUDY _____
☐ TURBID_____
☐ ODOR _____
☐ OTHER (SEE NOTES)

EQUIPMENT DOCUMENTATION

PURGING / SAMPLING
☐ / ☐ PERISTALTIC PUMP
☐ / ☐ SUBMERSIBLE PUMP
☐ / ☐ BAILER
☐ / ☐ PVC/SILICON TUBING
☐ / ☐ TEFLON/SILICON TUBING
☐ / ☐ AIR LIFT
☐ / ☐ WATERRA
☐ / ☐ IN-LINE FILTER
☐ / ☐ PRESS/VAC FILTER
☐ / ☐ _____

EQUIPMENT ID
ISCO #_____
KECK # ☐ 2" ☐ 1" #___
☐ QED

DECON FLUIDS USED
☐ LIQUI-NOX
☐ DEIONIZED WATER
☐ HNO3/D.I. WATER
☐ POTABLE WATER
☐ TSP SOLUTION
☐ NONE
☐ _____

WATER LEVEL EQUIP. USED
☐ ELECTRIC COND. PROBE
☐ FLOAT ACTIVATED
☐ KECK INTERFACE PROBE
☐ OTHER

NUMBER OF FILTERS USED _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
☐					☐	

NOTES

SIGNATURE:_____

Figure 4-3

ALMY BROTHERS SITE # 7-04-021 DATE _____

INSPECTION REPORT FORM

OVERALL SITE

FENCE/GATE CONDITION GOOD FAIR POOR LOCKED?

DRAINAGE PROBLEMS YES NO ~~TABLE 5-1~~

EVIDENCE OF TRESPASS YES NO

NOTE ANY CHANGES IN USE OF THE PROPERTY

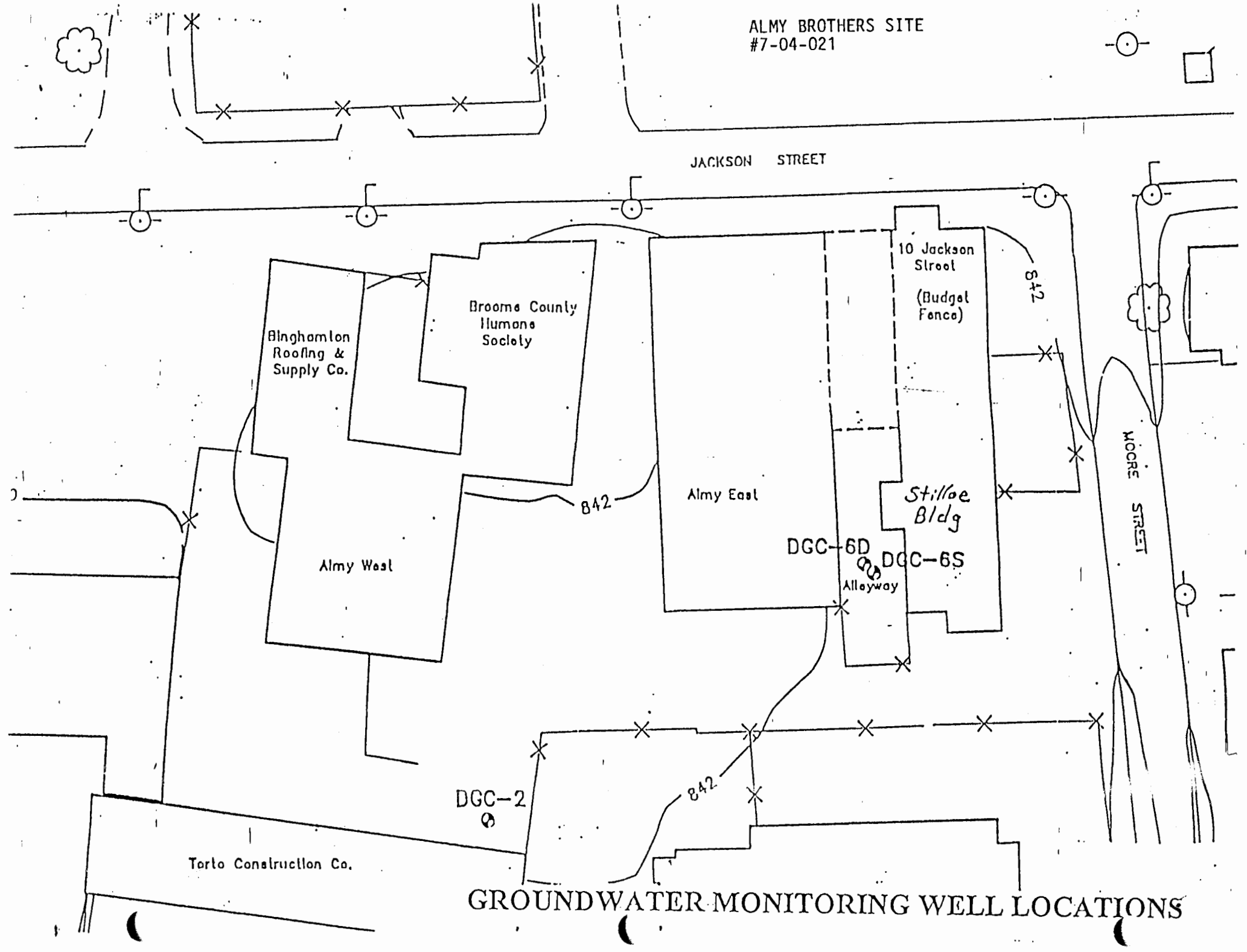
GROUNDWATER MONITORING SYSTEM ~~MAINTENANCE ITEMS~~

~~ALMY BROTHERS SITE~~

~~NYSDEC SITE NO. 7-04-021~~

Inspection Area	Item Noted	Action	Preventive Maintenance
1. Caps Well	~~a.~~ Cracked or broken	• Replace.	• Check during sampling
2. Locks Well	~~a.~~ Will not open ~~b.~~ Rusted c. Different key for each well	• Break open and replace. • Replace with the same lock number.	• Lubricate during sampling
3. Surface seals	a. Cracked	• Re-grout.	• Inspect during sampling
4. Markings	a. None b. Mislabeled	• Remark.	
5. Water Level (semiannually)	a. Dry b. Silted in or blocked Well DAC-2 DAC-6S DAC-6D DAC-___	• DEC/DOH to determine if redrilling to a greater depth is warranted. • DEC/DOH to determine if redrilling is warranted. • Abandon in-place and/or install new well.	• Check during sampling

INSPECTOR _____



GROUNDWATER MONITORING WELL LOCATIONS

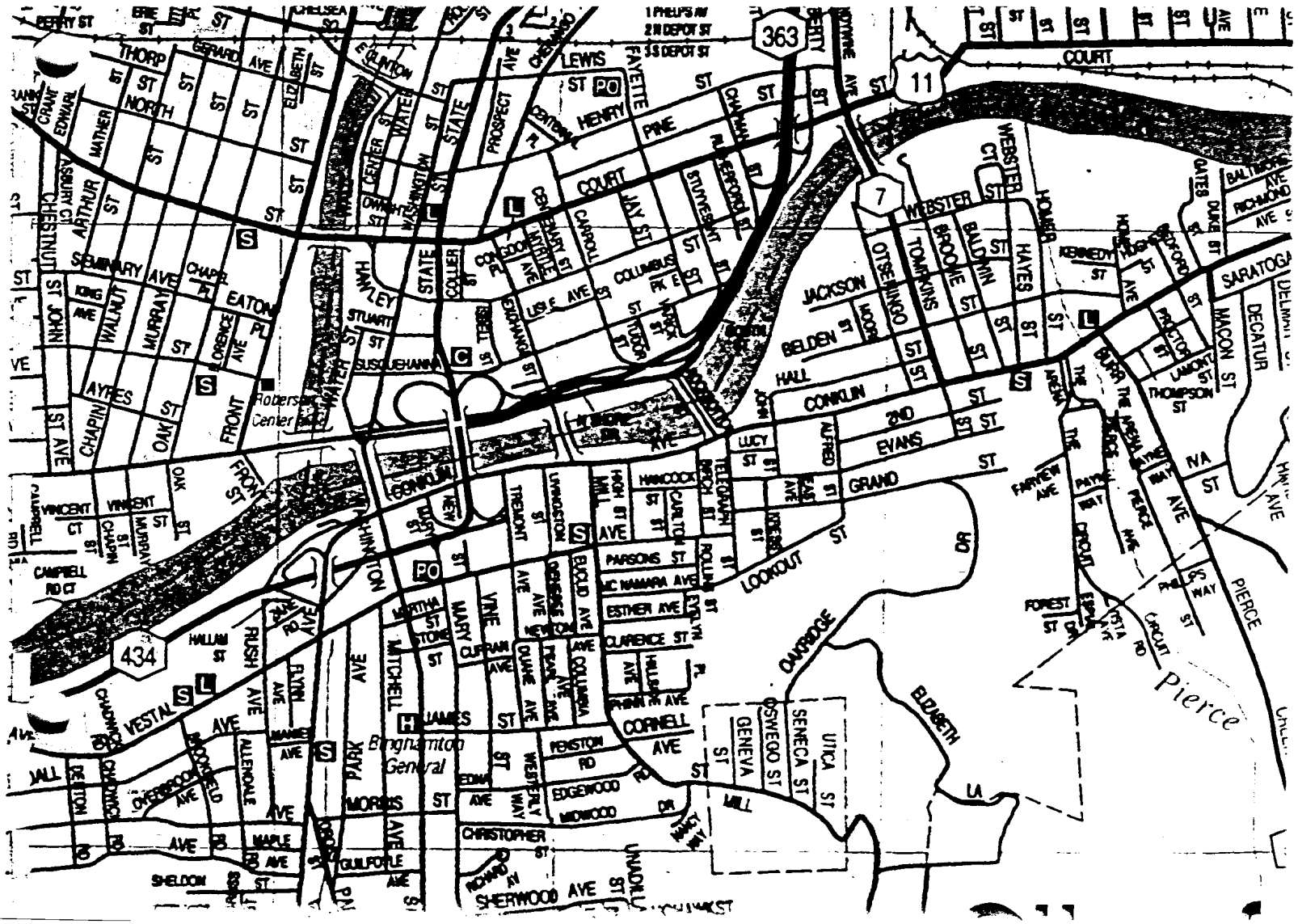
FIGURE 2

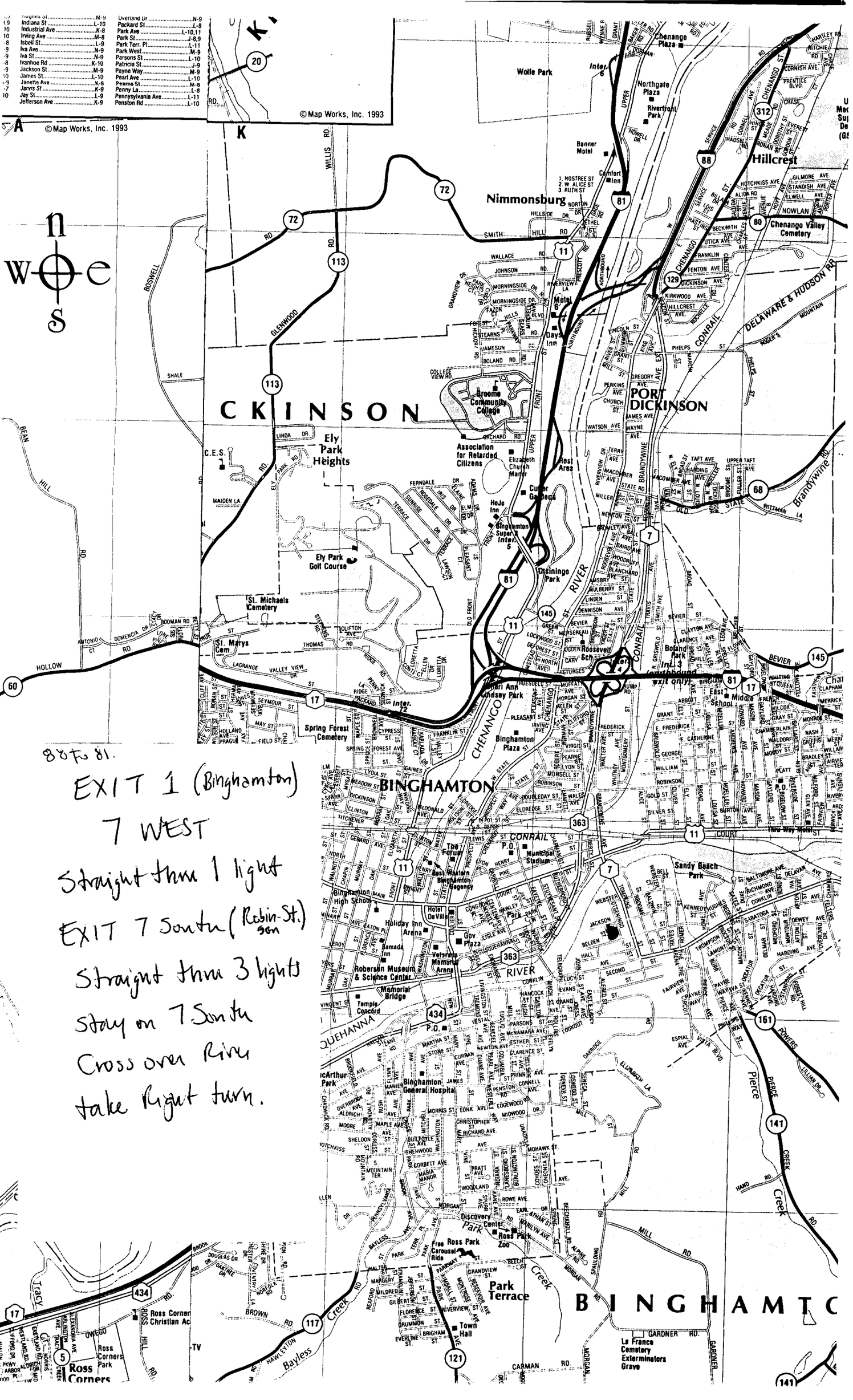
BINGHAMTON GENERAL HOSPITAL
20-42 MITCHELL AVENUE
BINGHAMTON, NY 13903

(607) 762-2231 EMERGENCY
(607) 762-2400 INFORMATION

Directions from the Almy Brothers site to the hospital:

1. Exit the Jackson Street gate
2. Turn right onto Tompkins Street
3. Turn right onto Conklin Avenue
4. Turn left onto S. Washington Street
5. Turn right onto Vestal Avenue
6. Turn left onto Park Avenue to **EMERGENCY ROOM**





80 to 81.

EXIT 1 (Binghamton)
7 WEST
Straight thru 1 light
EXIT 7 South (Robin St.)
Straight thru 3 lights
stay on 7 South
Cross over River
take Right turn.