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

OCTOBER 1997

Prepared for:

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

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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 constaminants 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

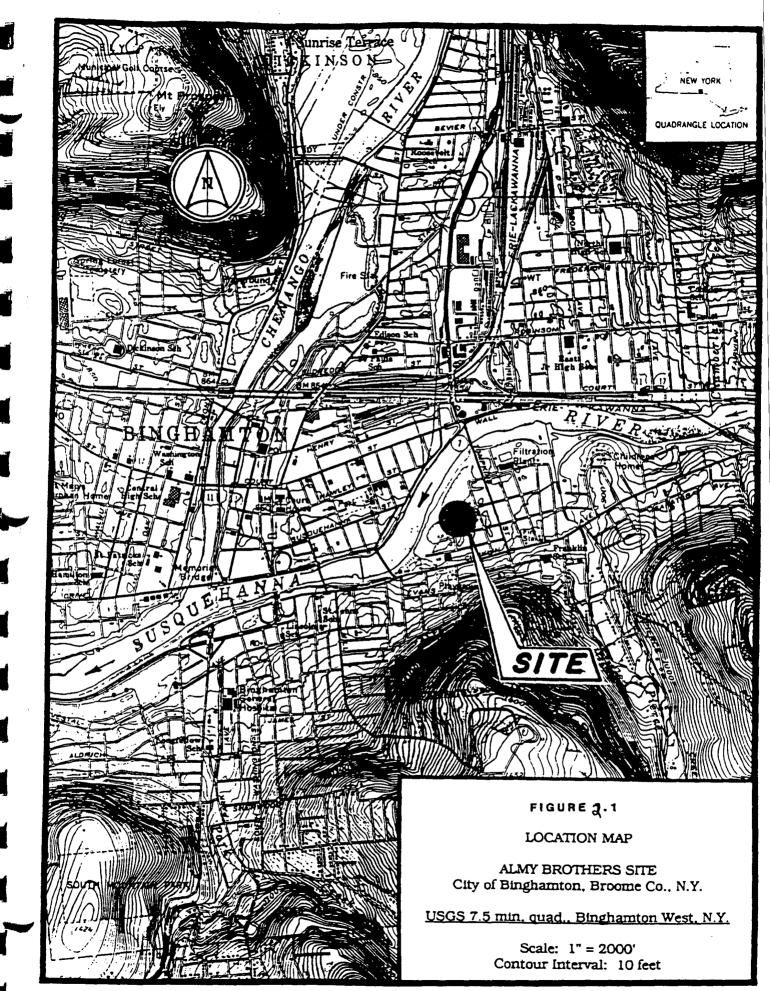
Based on grain size descriptions and the result of a hydraulic conductivity test performed at DGC-6D, the stratifield drift deposits have the greatest potential for groundwater yield. Well DGC-6D is screened exclusively in the stratified drift and a hydraulic conductivity (K) test performed at this well 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.

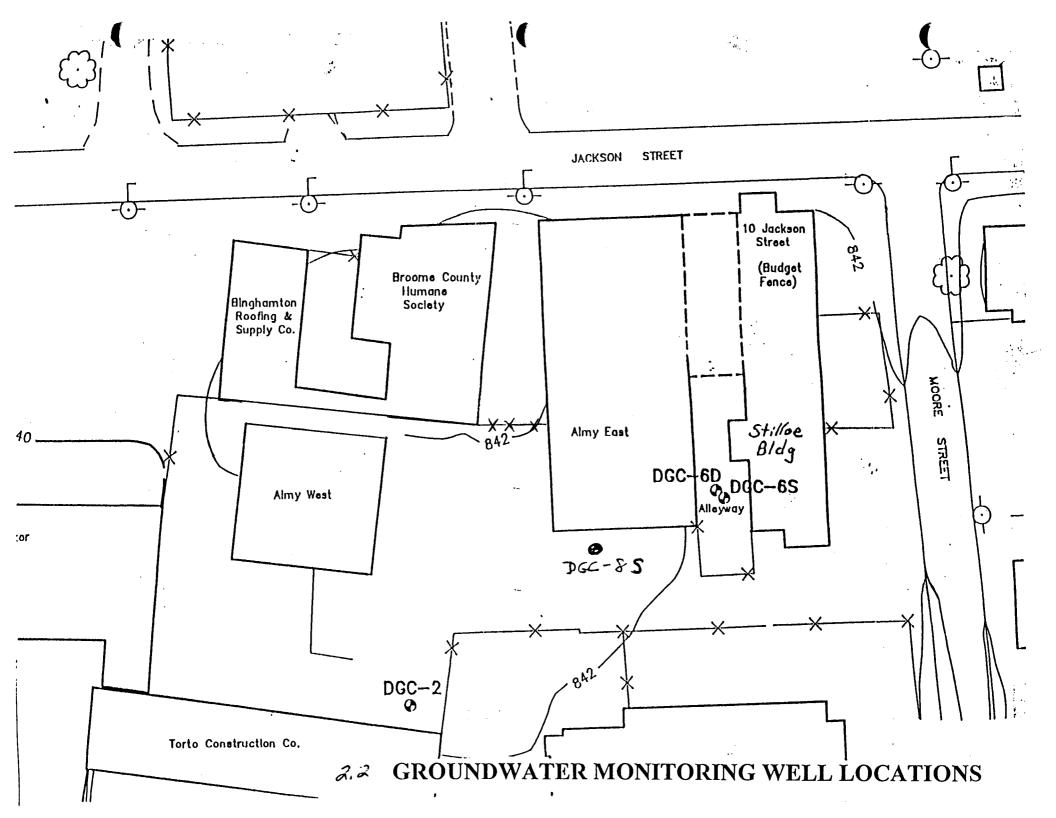
Given the close proximity of the site to the Susquehanna River, it is suspected that groundwater levels at the site are controlled in part by changes in the river level. Depending on the timing of precipitation events, the river may be recharging or draining the floodplain aquifer, driving local flow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





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

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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.

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.

4-4

4046e STARSLIST

					ed Soil Cleanup C Oil Contaminate	3				
Contaminant	CAS	Partition	Recommended	Groundwater	Allowable Soil	Soil Cleanup	USEPA Health	Based	Detection	Rec.soil
	Registry	coefficient	EPA Method	Standards/	Concentration	objectives to	(HEAST)	(ppm)	Limit	Cleanup
	Number	Koc		Criteria Cw	Cs ¹	Protect GW	Carcinogens	Systemic	Solid	Objective
				ug/l or ppb.	(ppm)	Quality (ppm)	_	Toxicants	(ppb)	(ppm)
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	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	*As per TAGM 404	6 individual and 1	the sum of VOCs not liste	d (Tentatively Iden	ntified Compounds(T	TCs))≤ 10 ppm				_
MDL - Method Detection Limit	**As per TAGM 40	46 individual nor	n-carcinogenic semivolati	les \leq 50 ppm and to	otal semivolatiles not	listed (Tentatively	Identified Compoun	ds(TICs))≤ 500p	pm	
1 - Allowable concentration with no Dilution Attenuation Factor - see TAGM 4046	Note: Soil cleanup o	bjectives are dev	eloped for soil organic ca	arbon content (f) of	f 1%, and should be a	adjusted for the actu	al soil organic carbo	on if it is known.		

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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:

		<u>Ap</u>	propriat	te Prepa	ration To	<u>echniqu</u>	<u>e</u> a	
		5030/		·		-	Direct	
Compound	CAS No. ^b	5035	<u>503</u> 1	5032	_5021	5041	Inject.	
Acetone	67-64-1	рр	с	с	nd	с	с	
Acetonitrile	75-05-8	pp	С	nd	nd	nd	c	
Acrolein (Propenal)	107-02-8	pp	c	С	nd	nd	c	
Acrylonitrile	107-13-1	pp	с	с	nd	С	c	
Allyl alcohol	107-18-6	ht	C	nd	nd	nd	c	
Allyl chloride	107-05-1	С	nd	nd	nd	nd	С	
Benzene	71-43-2	с	nd	с	С	с	с	
Benzyl chloride	100-44-7	С	nd	nd	nd	nd	с	
Bis(2-chloroethyl)sulfide	505-60-2	рр	nd	nd	nd	nd	С	
Bromoacetone	598-31-2	pp	nd	nd	nd	nd	С	
Bromochloromethane	74-97-5	c	nd	С	с	с	С	
Bromodichloromethane	75-27-4	С	nd	С	С	С	С	
4-Bromofluorobenzene (surr)	460-00-4	С	nd	С	с	С	С	
Bromoform	75-25-2	С	nd	с	С	с	С	
Bromomethane	74-83 - 9	С	nd	с	С	с	С	
n-Butanol	71-36-3	ht	с	nd	nd	nd	С	
2-Butanone (MEK)	78-93-3	рр	с	С	nd	nd	С	
t-Butyl alcohol	75-65-0	pp	С	nd	nd	nd	С	
Carbon disulfide	75-15-0	pp	nd	С	nd	С	С	
Carbon tetrachloride	56-23-5	С	nd	С	С	С	с	
Chloral hydrate	302-17-0	рр	nd	nd	nd	nd	С	
Chlorobenzene	108-90-7	С	nd	С	С	С	С	
Chlorobenzene-d₅ (IS)		С	nd	С	С	С	С	
Chlorodibromomethane	124-48-1	С	nd	С	nd	С	С	
Chloroethane	75-00-3	С	nd	С	С	С	С	
2-Chloroethanol	107-07-3	рр	nd	nd	nd	nd	С	
2-Chloroethyl vinyl ether	110-75-8	С	nd	С	nd	nd	С	
Chloroform	67-66-3	С	nd	С	С	С	С	
Chloromethane	74-87-3	С	nd	C .	C .	C.	С	
Chloroprene	126-99-8	с	nd	nd	nd	nd	С	
3-Chloropropionitrile	542-76-7	I	nd	nd	nd	nd	рс	

(continued)

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		<u>Ap</u> 5030/	propriat	<u>e Prepa</u>	ration To	echniqu	<u>e</u> ª Direc
Compound	CAS No. ^b	5030/	5031	5032	5021	5041	Inject
Crotonaldehyde	4170-30-3	рр	с	nd	nd	nd	с
1,2-Dibromo-3-chloropropane	96-12-8	рр	nd	nd	с	nd	с
1,2-Dibromoethane	106-93-4	c	nd	nd	с	nd	с
Dibromomethane	74-95-3	с	nd	С	с	с	с
1,2-Dichlorobenzene	95-50-1	с	nd	nd	с	nd	с
, 3-Dichlorobenzene	541-73-1	с	nd	nd	с	nd	с
,4-Dichlorobenzene	106-46-7	с	nd	nd	с	nd	с
1,4-Dichlorobenzene-d₄ (IS)		с	nd	nd	С	nd	с
cis-1,4-Dichloro-2-butene	1476-11-5	c	nd	С	nd	nd	с
rans-1,4-Dichloro-2-butene	110 - 57-6	рр	nd	С	nd	nd	с
Dichlorodifluoromethane	75-71-8	Ċ	nd	с	С	nd	с
1,1-Dichloroethane	75-34-3	c	nd	С	с	с	с
1,2-Dichloroethane	107-06-2	с	nd	с	с	с	с
1,2-Dichloroethane-d₄ (surr)		С	nd	c	с	с	с
1,1-Dichloroethene	75-35-4	c	nd	C	с	с	с
rans-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 C	nd	c	nd	C	c
rans-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
I,4-Difluorobenzene (IS)	540-36-3	nd	nd	nd	nd	C	nd
I.4-Dioxane	123-91-1	pp	c	c	nd	nd	c
Epichlorohydrin	106-89-8	PP 	nd	nd	nd	nd	c
Ethanol	64-17-5	İ	C	c	nd	nd	c
Ethyl acetate	141-78-6	İ	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	рр С	nd	c	nd	nd	c
Fluorobenzene (IS)	462-06-6	c	nd	nd	nd	nd	nď
Hexachlorobutadiene	87-68-3	c	nd	nd	C	nd	C
Hexachloroethane	67-72-1	1	nd	nd	nd	nd	c
2-Hexanone	591-78-6	рр	nd	c	nd	nd	c
2-Hydroxypropionitrile	78-97-7	PP 	nd	nd	nd	nd	pc
odomethane	74-88-4	c	nd	C	nd	C	c
sobutyl alcohol	78-83-1	pp	c	nd	nd	nď	c
sopropylbenzene	98-82-8	рр С	nd	nd	C	nd	c
Valononitrile	109-77-3	pp	nd	nd	nd	nd	c
Matchacrylonitrile	126-98-7	pp	J	nd	nd	nd	c
Methanol	67-56-1	PP I	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
I-Methyl-2-pentanone (MIBK)	108-10-1	pp	c	C	nd	nd	c
Naphthalene	91-20-3	рр С	nd	nd	c	nd	c

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

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

- С
- Adequate response by this techniqueMethod analyte only when purged at 80°C ht
- = Not determined nd
- 1 = Inappropriate technique for this analyte
- = Poor chromatographic behavior рс
- = Poor purging efficiency resulting in high Estimated Quantitation Limits рр
- = Surrogate surr
- = Internal Standard IS

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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	1,3-Dichloropropane
n-Butylbenzene	2,2-Dichloropropane
sec-Butylbenzene	1,1-Dichloropropene
tert-Butylbenzene	p-Isopropyltoluene
Chloroacetonitrile	Methyl acrylate
1-Chlorobutane	Methyl-t-butyl ether
1-Chlorohexane	Pentafluorobenzene
2-Chlorotoluene	n-Propylbenzene
4-Chlorotoluene	1,2,3-Trichlorobenzene
Dibromofluoromethane	1,2,4-Trimethylbenzene
cis-1,2-Dichloroethene	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 $5 \mu g/kg$ (wet weight) for soil/sediment samples, 0.5 mg/kg (wet weight) for wastes, and $5 \mu g/L$ 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 écolers in which the samples are packed must be accompanied by a chain-ofcustody 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

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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					
SA	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.

^aHardness sample isⁱtaken from metals container.

S	AMPLE PRESERVAT	ABLE 4-2 TION AND HOLDING TI D WATER SAMPLES	MES		
ParmeterPreservativeMaximum Holding TimeaSoilWater					
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	HNO3 to pH<, cool to 4° C	- 6 months	6 months -		

^aHolding times are based on verified time of sample receipt (VTSR).

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TABLE 4-3			
	FIELD QC SAMPLES		
Ground and Surface Water a	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".

^aRinsate blanks are required only for groundwaters where bailers are being decontaminated between samples.

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CUSTODY SE			CUSTODY SEAL Date: Signature:
	Jcb Nc.: Date:/ / Sample Test for:	pH:	
ة	Preserved with:		40015

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FIGURE 4-1 SAMPLE CUSTODY SEAL/LABEL

Project No.: Project Name:							*۰	Project Manager:							
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Samplers: (Signaturee)							Flotd Team Leader:						/////		
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CHAIN-OF-CUSTODY

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Figure 4-2 SAMPLE CHAIN-OF-CUSTODY RECORD

QAPP\3079_CC.PM5

APPENDIX PAGE _____ OF ___ Almy Brothers Site #7-04-021 GROUNDWATER SAMPLING LOG SHEET DATE SAMPLE LOCATION ACTIVITY START END LOCATION ID FIELD OC DATA: C FIELD DUPLICATE COLLECTED DUP ID WATER LEVEL / WELL DATA PROTECTIVE PROTECTIVE MEASURED " TOP OF WELL CASING STICK-UP FT CASING/WELL DIFF. FT HISTORICAL đ FT WELL DEPTH TOP OF CASING (FRCH GROUND) WELL DIA. 2 INCH 4 INCH ERIAL: WELL INTEGRITY: E PROT. CASING SECURE CONCRETE COLLAR INTACT HISTORICAL WELL MATERIAL: DEPTH TO FT WELL DEPTH FT WELL LOCKED . WATER OTHER: .16 GAL/FT (2 IN) GAL/VOL AMBIENT AIR VOA HEIGHT OF PPM x .65 GAL/FT (4 IN)= WATER COLUMN FT 1.5 GAL/FT (6 IN) TOTAL GAL PURGED WELL MOUTH PPM ۵ GAL/FT (__IN) **PURGE DATA** SAMPLE OBSERVATIONS CLEAR PURGE VOLUME ລ GAL a GAL 2 GAL GAL ລ GAL a COLORED_ TEMP, DEG C pH, UNITS TURSID_ SPECIFIC CONDUCTIVITY umhos/cm COOR ___ OTHER (SEE NOTES) EQUIPMENT DOCUMENTATION DECON FLUIDS USED PURGING SAMPLING EQUIPMENT ID VATER LEVEL EQUIP. USED ELECTRIC COND. PROBE FLOAT ACTIVATED P PERISTALTIC PUMP ISCO # LIQUI-NCX SUBMERSIBLE PUMP DEIGNIZED WATER KECX # FLOAT ACTIVATED П **BAILER** HNO3/D.I. WATER KECK INTERFACE PROBE O OTHER POTABLE WATER PVC/SILICON TUBING TSP SOLUTION TEFLON/SILICON TUBING b AIR LIFT NONE NUMBER OF FILTERS USED VATERRA IN-LINE FILTER PRESS/VAC FILTER ANALYTICAL PARAMETERS HETHCO FILTERED PRESERVATION VOLUME SAMPLE SAMPLE BOTTLE ID NUMBERS NUMBER METHCO RECUIRED COLLECTED Γ Г NOTES SIGNATURE:

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;
- Locki,
- 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

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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

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

I	nspection Area	Item Noted			Action	Preventive Maintenance		
1.	Caps	a.	Cracked or broken	•	Replace.	•	Check during sampling	
2.	Locks	a. b. c.	Will not open Rusted 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. b.	None Mislabeled	•	Remark.		mmY	
5.	Water Level (semiannually)	a. b.	Dry 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	

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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					

Mo	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. b. c.	Will not open Rusted 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. b.	None Mislabeled	•	Remark.			
5.	Water Level (semiannually)	Well Well	Dry Silted in or blocked DGC-2 DGC-6S DGC-6D DGC- 85	•	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

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- 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 onethird 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.

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TABLE 6.2.1

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATIZED WORK AREAS

Adjusted Temperature ^b	Normal Work ^e 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 $^{\circ}F = ta ^{\circ}F + (13 \times \% \text{ sunshine})$. 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.

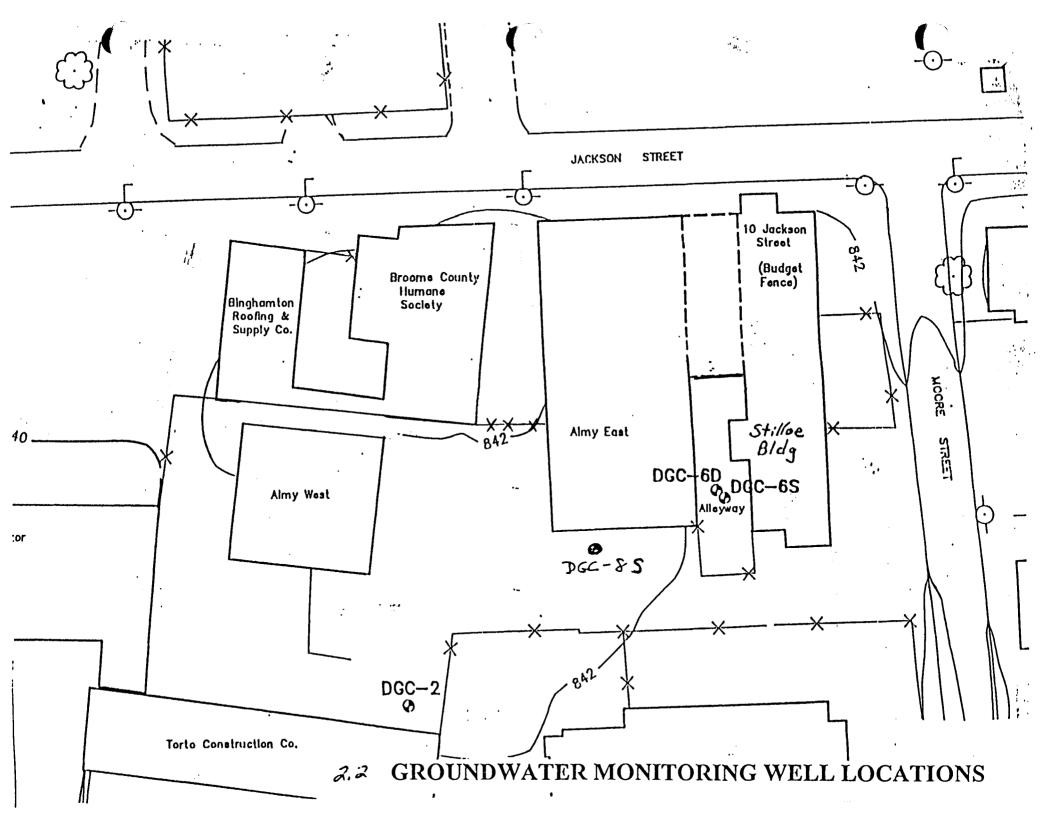
Further instruction will then be given by the Field Team Leader.

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.

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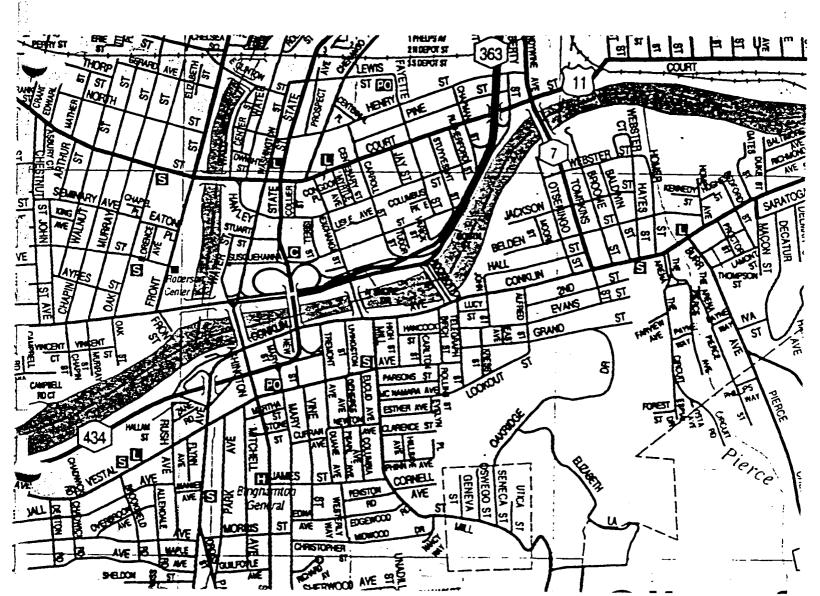
BINGHAMTON GENERAL HOSPITAL 20-42 MITCHELL AVENUE BINGHAMTON, NY 13903

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

Directions from the Almy Brothers site to the hospital:

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- 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

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TABLE 15A

Groundwater Sampling Results Field Analyses

Almy Brothers Site Binghamton, NY

			Specific		
	Temp		Conductivity	Turbidity	
	<u>(*C)</u>	PH*	(umho)	(NTU)**	
First Phase RI (J	luly 23 - 25, 1	991)			
DGC-1	18.5	7-7.5	.950	ND 50	
	in the	×.W.		. 3 . /	
DGC-3	15	6-7	650	20	
DGC-4	21.2	8	1,000	15	
DGC-5	21	7.5	730	24	
				.	754. I i A
	13.3	11.5	1.000	Ħ,	
Second Phase RI	(September	15 - 16, 19	92)		Vrc.
DGC-1	16.1	6.05	1,250	>200	
				10-7	
DGC-3	14.3	4.26	750	27	
DGC-4	17	6.05	1,000	>200	
DGC-5	16.2	5.9	710	>200	
					
	ax145		- 99	······································	
DGC-7S	15.8	6.51	348	>200	
DGC-7D	14.4	6.58	900	>200	

* 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.

DUNN GEOSCIENCE ENGINEERING CO., P.C. ALMYRPT - GWFIELD: UPDATED 5/20/93

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			u u	Almy Bro Binghar	List (TCL) others Site nton, NY rtcd in ug/l (·		Duplicate	Surface Water from 10 Jackson St. Basement	
Parameter	DGC-1		DGC-3	DGC-4	DGC-5			DGC-6D	SW1	Standards(a
Volatile Organics		-9	<u> </u>				2015 C	······	· ·····	<u> </u>
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	A. 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					• • • •					100(0)
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 Com			_			-			ater Standards or	
(a) Standards for groundwater use					J		in estimated val			•
NYSDEC Sept. 1991 6NYCRR		-	-	tions	B				blank, as well as	a sample
for Surface Waters and Groundy		-,			.,		-		ontamination and	•
(b) NYSDOH Part 5 Sanitary Cod		for unspecifie	d organic c	ontaminante	i		e appropriate a		on and the and	
(c) Standard for Principal Organic		-	a or Banne e	omannana	ND				ument detection	limit
(d) NYSDOH Part 5 Sanitary Cod			and VOC	•		Not analya		areated mou		

DUNN GEOSCIENCE ENGINEERING CO., P.C. ALMYRPT - JULGW.XLS: UPDATED 5/21/93

.

TABLE 5.15B (Continued)

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

		<u>م</u>		D	ingnamton,	NI			Surface	
j.				Results ar	Duplicate of	Water from 10 Jackson St. Basement	GW			
Parameter	DGC-1	Duc	DGC-3	_DGC-4	DGC-5	DUCTO				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
								Dup. of		
Herbicides			DGC-3RE							
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		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.

- 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.

C.

- ND Not detected above the indicated instrument detection limit.
- RE Sample was recollected and reanalyzed.

* Analytes that were not detected in any of the referenced samples were not included in this table.

				TABL	E 5B (Con	tinued)				
Parameter	DGC-1		Duplicate of DGC-6D	Surface Water from 10 Jackson St. Basement SW1	GW					
Inorganics			DGC-3	DGC-4	DGC-5	Intronos		000-00	511	Standards*
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 I	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 I	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 I	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	ND9	10 B	
Potassium	9,820	16,400	9,120	15,200	8,730	12,700	5,730	5,850	16,300	-
Selenium	ND I	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)

5

BOLD = Value exceeds NYSDEC Groundwater Standards.

TABLE 5.15C

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

Standards(a)
50(b)
5(c)
50(b)
100(d)
ND
0.1
35
4.4
0.26

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

r G

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TABLE 5.15C (Continued)

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

				Results are	reported in		Duplicate				Standard
Parameter	DGC-1	and a start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the start of the	DGC-3	DGC-4	DGC-5	and the second second		and the second	DGC-7S	SGC-7D	(8)
Semivolatile Organics		A.									
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 I	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.

BOLD Values in bold print exceed Groundwater Standards or Guidelines.

6 3

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.

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

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

APPENDIX B

GROUNDWATER MONITORING WELL LOGS

ż

		n n Geos iny, NY 12		•	58-1313	TEST	BORING	g log	BOR	ING I	No. DGC-02
PROJE	ст		Alm	y Broti	ners Site	L			SHEET	1 OF	2
CLIENT			NYS	DEC					JOB No.		00296-01946
DRILLIN		TRACTOR	H&	S Bori	ngs Inc.				MEAS. P	T. ELEV.	842.72
PURPO	SE		Моп	itoring	Well	•			GROUN	DELEV.	840.7
DRILLIN	IG MET	HOD HO	liow St	em Au	ger	SAMPLE	CORE	CASING	DATUM		MSL
		E Mo	bile B-	34	TYPE	SS		HSA	DATE ST	ARTED	04/23/91
GROUN	DWATE	R ELEV.	835.	04'	DIA.	2" OD		6 1/4	DATE FI	NISHED	04/24/91
MEASU	RING P	OINT	Тор	of PV(WEIGHT	140 #			DRILLER	1	L. Charbonneau
DATE C	F MEAS	SUREMEN	· ·		FALL	30"			INSPECT	TOR	M. Williams
DEPTH FT. INTERVAL	RECOVERY. SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6°	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GE	OLOGIC DE	ESCRIPTIO	4	ELEV. DEPTH		REMARKS
			ML		Bk \$s, mf S,	tfG				Rec =	1.8
		28	-							Moist	
_	S-1	16									
		21									
			1		Black SILT s fine Gravel (I		m to tine Sa	nd. trace			
2-	8	27	-		Br cm(+)f S,		c tar chip ar	nd		Rec =	1.0
	S S		SP		porcelain		·			Moist	
	S-2										:
4											
		5	GP		Br mf G s, m	fS, I\$; cind	ers			Rec =	0.5
×	2								•		
-	S-3	3									
		1								ļ	
- X.		1		ė					1	Ŧ	
6-			SP		Br cm(-)f S, s	s \$, t f G cin	ders.			Rec =	0.3
ľ]	4	56							Wet	
	S-4	6									
	0-4	2			Brown coarse some Silt, tra						
							TOL UNDES				
8		2			Do						
		3			Do					Rec =	U.6
ß											
-	S-5	2				/=					
		3				(FIL	L)				
		5			. <u> </u>			·····	830.9	ļ	

			nn Geos any, NY 12		-	58-1313	TEST BORING LOG	BOR	ING No. DGC-02	
Ĩ.	PROJ	ECT		Almy	Brot	2 OF 2				
• •	CLIEN	IT		NYS	DEC	JOB No.	ЮВ No. 00296-01946			
j.	DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NI ILLEE	SAMPLE SAMPLE SPOON PER 6"	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GEO	DLOGIC DESCRIPTION	ELEV. DEPTH	REMARKS	
J			3	ML/MH		Gr \$&C		9.8	Rec = 1.0 Wet	
Ĩ	-	S-6	5							
ļ	12-	8	9			Gr\$&C,tfG			Rec = 0.4	
Ĵ		×	12	мн					Very Wet	
	-	S-7	15 12			Gray SILT an (ML/MH).	d CLAY trace, fine Gravel			
	14-		12						Rec - 0.0 MG blocked shoe	
		S-8	7 15		-				resample Wet Rec = 0.2	
9			23	GP		GrmfGa, fS		825.2 15.5		
	16-		25			some Silt & C	to fine GRAVEL and, fine Sand, Clay (GP), STRATIFIED DRIFT)			
								823.7		
1	1			•		End of Boring 17.0'.	Sampled to 16.0'. Augered to	17.0		
I			•							
i,										

•. .

		n Geos y, NY 12		•	58-1313	TEST	BORING	g log	BOR	ING I	No. DGC-06S
PRO.	JECT		Alm	y Broti	ners Site				SHEET	1 OF	1
CLIE	NT		NYS	DEC					JOB No.		00296-01946
DRIL		RACTOR	Н&	S Bori	ngs inc.				MEAS. P	T. ELEV.	844.82
PURI	POSE		Mon	itoring	Well				GROUND	ELEV.	842.5
DRIL		OD HO	ilow St	em Au	iger	SAMPLE	CORE	CASING	DATUM		MSL
DRIL	L RIG TYPE	CM	IE-55		TYPE	NA		HSA	DATE ST	ARTED	05/02/91
GRO	UNDWATE	R ELEV.	832.	22'	DIA.			4 1/4	DATE FI	NISHED	05/02/91
MEAS	SURING PO	INT	Тор	of PV(WEIGHT				DRILLER		L. Charbonneau,
DATE	OF MEASU	JREMEN	T 07/2	3/91	FALL				INSPECT	OR	C. Gaule
DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6*	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GE	EOLOGIC DE	ESCRIPTION	4	ELEV. DEPTH		REMARKS
					See boring	log for DGC-	6D				
					?						
										4	
				ė							
		-									
				-							

]

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313 PROJECT Almy Brothers Site							TEST	BORIN	g log	BOR	ING I	No. DGC-06D
						hers Site				SHEET	1 OF	4
CLIENT NYSDEC										JOB No.		00296-01946
DRILLING CONTRACTOR H & S Borings Inc.						ngs Inc.			•	MEAS. P	T. ELEV	. 844.73
PUR	POSE			Mon	itoring	j Well				GROUNE	ELEV.	842.8
DRIL	LING	METH	HOD HS	A/Driv	e Casi	ng	SAMPLE	CORE -	CASING	DATUM		MSL
DRIL	LRIG	TYPE	E Mo	bile/Cl	ME-55	TYPE	SS		Steel	DATE ST	ARTED	04/26/91
GRO	UNDV	VATE	A ELEV.	831.	89'	DIA.	2" OD		6.25/4.25	DATE FI	ISHED	04/30/91
	SURIN				of PV(WEIGHT	140 #			DRILLER		L. Charbonneau,
DATE	OF	MEAS	UREMEN	T 07/2	3/91	FALL	30*			INSPECT	OR	C. Gaule
DEPTH FT.	INTERVAL, RECOVERY,	SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GE	EOLOGIC DE	SCRIPTIO	N	ELEV. DEPTH		REMARKS
	8		7	sw		Bk cmf S, a	\$, I f G, cind	ers	·····	<u>.</u>	Rec -	1.5
	8000										Dry	
-	XXXXXX :	S-1	15			Black coars	e to fine SAN	ID, and Silt.	little fine			
			10			Gravel: cind	<u>ers (SW).</u>			841.3		
			6	ML		Br Cy\$ t, f S	(FIL	L)		1.5		
2-	8		0	1		Do; occ f S					Rec -	1.0
			4	1							Moist	
_	×.	S-2	6									;
		5-2	9									
			5									
4-	8		10							838.8	Pee	1 4
			12	SP		BrfS,1\$				-838.3	Rec = Moist/	
	X	[8	ML		Br\$s,fS				4.5		
-		S-3	0							/		
	×		20									
6-			30		i							
0-		Ī	.3			Br\$s, f\$; n	nottled red b	rown			Rec = Moist	1.2
		ł									WUS	
_		5-4	5			Brown SILT	some, fine S	and: mottle	d brown			
	Ĩ	ļ	5			<u>(ML).</u>						
			6									
8-	8				·· •-	Br\$s,fS					Rec =	1.5
	**	ŀ	4								Wet	
_		6-5	5	SP			(FLOOD-PL	AIN SILT)	···	833.6		
	XX	ļ	6			Br mf(+) S, s				9.2		
			6				(STRATIFIE	D DRIFT)				

	Albar	n Geosi ny, NY 12		•	58-1313	TEST BORING LOG	BORI	NG No. DGC-0			
PRO.	JECT		Almy	y Broti	hers Site		SHEET	SHEET 2 OF 4			
CLIEI			NYS	DEC			JOB No.	00296-01946			
DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GEC	DLOGIC DESCRIPTION	ELEV. DEPTH	REMARKS			
		1	SP		Br mf(+) S, s	\$		Rec = 1.6 Wet			
		2									
-	S-6	3			Gr mf(+) S, s	\$					
	×										
12-	8	6	ML		Br gr \$s, mf S	5		Rec = 2.0			
		2						Wet			
-	S-7	2	SP		Branfl NC -	¢					
•	×	3				\$ m to fine (+) SAND, some Silt					
	**	6			<u>(SP).</u>						
14-	Ř.	3	1		Gr cmf(+) S, : Gr cmf(+) S,			Rec = 1.8 Wet			
	**				Br cmf(+) S, s	\$	14.3	***			
_	S-8	2			Brown coarse (SP).	e to fine (+) SAND. some Silt					
	***	3									
16-	×	9			Gebe and A	S of					
	***	9			Gr bn cmf(+)	0, 5 0		Rec = 0.6 Wet			
		19									
-	S-9										
		8			Grath Ca						
18-	8	10	SP	ė	Gr mf(+) G s Br cm(+)f S, I			Rec = 0.3			
	Ň	10	57					Wet			
-	S-10	9									
		3									
~~		9									
20-	8	4	GP		Br f G s(-), cn			Rec = 0.2 Wet			
			ĺ		(+) Sand, little	RAVEL some (-), coarse to fine e Silt (GP).					
-	S-11	10									
		7			(STRATIFIED DRIFT)					
22-		3					820.8	Baa 0.5			
	Š.	20	ML		Br CyS a, mf (GLACIAL LA		۷.۷	Rec = 0.5			

		unn Geos bany, NY 1		•	oration 458-1313	TEST BORING LOG	BOR	ING No. DGC-06D
	JECT				hers Site		- 	3 OF 4
CLIE			·	DEC			JOB No.	00296-01946
DEPTH FT.	INTERVAL, RECOVERY, SAMPLE	NUMBER BLOWS ON SAMPLE SPOON BED #	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GEO	DLOGIC DESCRIPTION	ELEV. DEPTH	REMARKS
24-	S-1	31 29 14	sw		Sand, some f	e to fine SAND, little (+) Silt,	818.8 24.0	Wet (Dense) Rec = 1.0 Wet
26-	S-1		ML		Br Cy\$ a, cm	fS, I f G	<u>816.8</u> 26.0	Rec – 0.6 Wet (Dense)
28-	S-1	23 14 26 5 39	sw		((Br cmf S, s \$,	GLACIAL LAKE BED)	<u>814.8</u> 28.0	Rec – 1.0 Wet
30-		36 24 29	GP	÷		cmf (-) S, s \$ m (+) to fine GRAVEL and, (-) Sand, some silt (GP),	•	Sands entering the casing. Rec = 0.5 Wet
32-	8	23 39 52	GP		Br mf G s(+),	cmf S, I \$		Rec – 0.3 Wet
34-	S-1	7 <u>22</u> 20 26 22			(\$	STRATIFIED DRIFT)		Rec = 0.0

		Alban	n Geos iy, NY 12	205 ·	(518)-	58-1313 TEST BORING			NG NO. DGC-000
PROJ		•				ners Site			4 OF 4
CLIEN	11			NYS	DEC		X	OB No.	00296-01946
рертн	INTERVAL, BECOVERV	SAMPLE	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI- FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION		epth	REMARKS
		S-18	53			· · ·	-		
36-	8		53			Br cmf S, s(-) \$, t f G			Rec - 0.4
	×.		19 20			Brown cooper to fine SAND, coper ()	C:14		Wet
		S-19	21			Brown coarse to fine SAND, some (-) trace fine Gravel (SW).	<u></u>		
38-	*		100/0.4			Br mf(+) S, s \$, t f G			Rec - 0.5
	*		59 46			• • • •			Wet
-	5	5-20	40	SP					
40-			45			(STRATIFIED DRIFT)		802.8	Rec = 0.4
,	XX	-	22			Gn gr \$&C s, mf G Green gray SILT & CLAY some, medi	um to		Wet
-	S	5-21	<u>22</u> 14	ML		fine Gravel (ML), (GLACIAL TILL)			:
42-			20			End of Boring Sampled to 42.0'. Auge	ared to	800.8 42.0	
						42.0'.		72.0	
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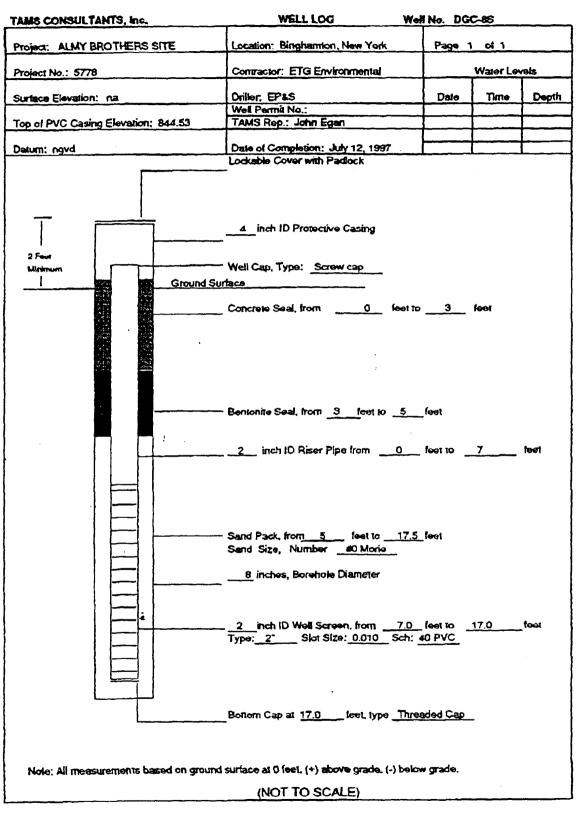
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APPENDIX C

MATERIAL SAFETY DATA SHEETS

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Material Safety Data Sheet May be used to comply with OSHA's Hazard Communication Standard, 25 CFR 1910.1200. Standard must be consulted for specific requirements.			d		ion
DENTITY (As I and and I and I and I and DDT - A FORMER CHLORINATED	PESTICID	E Note: Blank space			not applicable, or mo arked to indicate that
Section I					<u></u>
Manulacturer's Name		Emergency Telepi	none Number		
NOT CURRENTLY MANUFACTURED Address (Number, Street, City, State, and Zip Code)	. <u> </u>	N/A Telephone Numpe			
Address (Number, Sireel, City, State, and Zir Code)		N/A	e or intornation		
· · · · · · · · · · · · · · · · · · ·		Date Prepared 7/28/9	5		
		Signature of Prepa A.S. T			
Section II — Hazardous Ingredients/Ident	tity Informatio	on			······
Hazardous Components (Specific Chemical Identity, C	ommon Name(s))) OSHA PEL	ACGIH TLV	Other Lim Recommen	
DDT, DICHLORO DIPHENYL TRI	CHLORETHAN	NE 1.0 MG/M3		·	95+%
· · · · · · · · · · · · · · · · · · ·					
		·····			· · · · · · · · · · · · · · · · · · ·
Section III — Physical/Chemical Character Kolong Point EST. AT GREATER THAN					·····
olong Point ESI. AI GREATER IMAN	400 ⁰ F	Specific Gravity (H ₂ C) = 1)		2+
apor Pressure (mm Hg) 1.5 X 10-7 MM/HG AT 68 DEG.F		Metting Point			108°F
apor Density (AIR = 1)	10+	Evaporation Pate	NEGLIGIB	LF	
olubility in Water	101	(Buryl Acetate - 1)			
INSOLUBLE					<u>_</u>
WHITE TO GREY POWDER FAINT OR	NO ODOR	IN PURE FORM			
ection IV — Fire and Explosion Hazard D	ata				
ash Point (Method Used) IN EXCESS OF 300 DEGREES COC	<u></u>	Flammable Limits		LEL	UEL
WATER, FOAM OR DRY CHEMICAL		I NOI AFFLICA			<u> </u>
SCBA EQUIPMENT WOULD BE NEEDED	BOTH BEC	AUSE OF THE	URE CHEMT	CAL VAPOR	AND ITS
PROLYSIS PRODUCTS					
usual Fire and Explosion Hazards		· · · · ·			

FIRE - PHOSGENE AND HCL GASES ARE GENERATED AT HIGH TEMPERATURES

MATERIAL SAFETY DATA SHEET

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DDT - CHLORINATED PESTICIDE

REFERENCE FILE

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	Stable	x			<u>I MIT 1005 50</u>	
Incompatibility	Materials to Avoid	<u></u>			··· <u>-</u> ·····	
Hazardous Deco	mposition or Byprod	tucts	NOT APP			
PHOSGENE Hazardous	AND HCL BU	UT ON	LY AT HIGH Congruons to Avo		ATURES OF 60	0 + DEGREES F
Polymerization	·			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Will Not Occur	x				
Section VI -	Health Hazard	d Data				
Route(s) of Entry.		alation? S DUS'	PRIMARILY		RBS ACROSS	THIS COMPOUND IS STORED IN TH
Health Hazards /	Acute and Chronic)		· · · · · · · · · · ·		CT SKIN	TISSUE BUT HAS LIMITED IF AN EFFECTS EXCEPT AT VERY HIGH I
OPAT T	D50 (RATS)	250	MG/KG			
	LD50 (RATS					
Carcinogenicity:	NTF TED CARCINC	2) Y			RC Monographs? MAN	OSHA Regulated?
<u> </u>	TED CARCING					
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						FFECTS IN MAN OR EXPERIMENTAL
NIMALS T	•				O THE EYE AN	
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mergency and F	irst Aid Procedures	NO DEA	ATHS IN MA	N: FROM	ACCIDENTAL C	OR DELIBERATE INGESTION OR OCCU
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DBSERVED A	AT HIGHER D	OSES	IN EXPERIM	ENTAL A	ANIMALS	
ection VII	Precautions for	or Sate	Handling and	Use		
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	n Case Material Is	s Release	d or Spilled			
	n Case Matenal Is	s Release	d or Spilled			
aste Disposal Me	ethod	-	· · · · · · · · · · · · · · · · · · ·			
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MATERIAL SAFE	TY DATA SHEET			S-210 31:9203
Material Safety May be used to con OSHA's Hazard Cor 25 CFR 1910.1200. consulted for specific	nply with mmunication Standard, Standard must be		U.S. Department of Labor Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072	
IDENTITY (As Used or 2,4, D	HERBICIDE		Note: Blank spaces are not permitted, if any item is not information is available, the space must be marked	
Section I				
Manulacturer's Name HISTORICALLY	NUMEROUS BUT NOT	CURRENTLY	Emergency Telephone Number (LN U.S.	
	et, City, State, and ZIP Code)		Telephone Number for Information	······································
N.A	•		Date Prepared 7/28/95	<u> </u>
	· · · · · · · · · · · · · · · · · · ·	······································	Signature of Preparer (optional) A.S. TODD	
Section II - Haza	rdous Ingredients/Identi	ity Informatic		· · ·
Hazardous Components	: (Specific Chemical Identity: Co	ommon Name(s))	Other Limits OSHA PEL ACGIH TLV Recommended	4'e (optional
2,4, D o	r 2,4 DICHLOR	O PHENOXY	ACETIC ACID	····
	HITE CHRYSTALINE			
	IN A SOLVENT SOLU		TLV 10 MG/M3	
	ANT HERBICIDE OR		· · · · · · · · · · · · · · · · · · ·	
WETABLE EMULS	ION FOR SPRAY APP	LICATION.		<u></u>
	cal/Chemical Characteri	stics	•	
loilina Point		160° F	Specific Granty (H2O = 1)	1.14
ESS THAN 0.01	MM/HG AT 20 DEGR	EES C	Metting Print	138 ⁰ F
abor Density (AIR = 1)		8	Evaporation Pate NOT VOLATILE EXCEPT (Bury Acetate - 1) AT VERY HIGH TEMPERAT	URES
ERY SLIGHTLY	SOLUBLE			
Popearance and Ocor AINT ODOR IN		<u> </u>		<u> </u>
	nd Explosion Hazard Da	ata	<u> </u>	<u>·</u>
ash Pork (Merrod Used) 100 DEGREES +			Flammable Lumis LEL	UEL
Minguishing Mecia IATER, FOAM, C	O2 OR DRY CHEM			
		ILY UNLES	SS DILUTED IN SOLVENTS FOR FIELD A	PPLICATION
N WHICH CASE	THE SOLVENT IS TH	IE LIMITIN	IG FACTOR.	
VISUAL Fire and Explosion IILL GENERATE	PHOSCENE, HCL AND) 2,4,D VA	APORS AT HIGH TEMPERATURES ALL OF	WHICH
ANDATE THE US	E OF SCBA EQUIPME	ENT.		
roduce locally)	······································		Оѕна	174 Sept 1985
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Section V -	- Reactivity Data	3	
Stabilin;	Unstable		Conditions to Avoid
	Stable	x	
Incompatibility KEE	Materials to Avoid P AWAY FROM	OXII	DIZERS OR CAUSTICS
PHOSGENE	AND HCL IN	A F	IRE
lazardous olymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	
Section VI —	- Health Hazard	Data	
	ON HAZARD AS		
arcinogenicity.	NTP	7	IARC Monographs? OSHA Regulated?
NONE IN	ANY SCIENTIE	FIC L	ITERATURE
enerally ACCLAVA	and a state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second	ONC	TERM HICH EXPOSIDES CAN RESULT IN SYSTEMIC FEFECTS TO THE
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Naterial Salety Data Sheet Nay be used to comply with	U.S. Department of Labor Occupational Safety and Health Administration	, (.)
SHA's Hazard Communication Standard	(Non-Mandatory Form)	~//
5 CFR 1910,1200. Standard must be posulted for specific requirements.	Form Approved OMB No. 1218-0072	
ENTITY (As used on Laber and Losy 2,4,5 T P HERBICIDE	Note: Blank spaces are not permitted. If any item is no information is available, the space must be marked	
ection 1		
anulacturer's Name	Emergency Telephone Number	
poress (Number Sireet, City, State, and ZIP Code)	Telephone Number for Information	<u> </u>
	Date Prepared 7/31/95	
· · · · · · · · · · · · · · · · · · ·	S-gnature of Preparer (optional)	
	A.S. TODD	·
ction II — Hazardous Ingredients/Identity Information		
zardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL ACGIH TLV Recommended	
2,4,5 TRICHLORO PHENOXY	THIS COMPOUND HAS NO OFFICIAL	TLV. HOWEVER,
PROPIONIC ACID (2,4,5 TP). ALSO CALLED	ITS CHEMICAL SIMILARITY TO	2,4,D
SILVEX OR	AN EXPOSURE GUIDELINE OF 10 MG	M3 OR LESS
WEED B GON	WOULD BE APPROPRIATE.	
A HERBICIDE		
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tion III Physical/Chemical Characteristics		· · · · · · · · · · · · · · · · · · ·
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tion IÎI Physical/Chemical Characteristics g Pom ESTIMATED 200 DEGREES C MINIMUM	1.15 Metting Point	
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tion IÎI Physical/Chemical Characteristics g Port ESTIMATED 200 DEGREES C MINIMUM Pressure (mm Mg) NEGLIGIBLE Density (Alfa - 1)	1.15 Metting Point APPROX 150 DEGREES C Evaporation Pate	
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tion III Physical/Chemical Characteristics g Point ESTIMATED 200 DEGREES C MINIMUM Pressure (mm Hg) NEGLIGIBLE Dersny (Alfi - 1) 8-9 WERY SLIGHTLY SOLUBLE rance and Coox FAINT HYDROCARBON ODOR on IV Fire and Explosion Hazard Data Prom (Metrod Used) GREATER THAN 300 DEGREES F COC	1.15 Metting Point <u>APPROX 150 DEGREES C</u> Evaporation Pate (Butyl Acetate = 1) NEGLIGIBLE	
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Polymenzation	Will Not Occur					<u> </u>			<u> </u>
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Section VI -	- Health Hazard			Skin?		loce	Shon?		<u> </u>
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MATERIAL	SAFETY	DATA	SHEET
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MATERIAL SAFETY DATA SHEET	31.9203
Material Salety Data Sheet May be used to comply with USHA's Hazard Communication Standard, 25 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	Note: Blank spaces are not permitted, if any item is not applicable, or no information is available, the space must be marked to indicare that
Section I	•
Manufacturer's Name	Emergency Telephone Number
NO LONGER MANUFACTURED FOR USE IN TH Address (Number Street, City, State, and ZIP Code) U.S.	HE Telephone Number for Information
	Date Prepared
	7/31/95 Signature of Preparer (optional)
Section II — Hazardous Ingredients/Identity Inform	mation
Hazardous Components (Specific Chemical Identity; Common Nar	Other Limits me(s)) OSHA PEL ACGIH TLV Recommended % (opronan
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	· · · · · · · · · · · · · · · · · · ·
A CHEORINATED TEOTIOIDE	
Section III — Physical/Chemical Characteristics	·
oling Point 245 DEGREES C - DECOMPOSES	Specific Gravmy (H ₂ O - 1) EST. 1.2
2 X 10 ⁻⁷ MM/HG AT 77 DEGREES F.	Metting Point 200 DEGREES C
apor Density (AIR = 1)	Evaporation Pate NEGLIGIBLE
10 PLUS	(Buryl Acetare - 1)
INSOLUBLE opearance and Ocor	
FAINT HYDROCARBON CHEMICAL ODOR (PUR	RE COMPOUND)
ection IV — Fire and Explosion Hazard Data	
ash Point (Method Used) <u>OVER 300 DEGREES F - COC</u> Tinguishing Mecua	Flammable Limits LEL UEL
CO2 DRY CHEM FOAM AND WATER	
WATER NOT RECOMMENDED BECAUSE OF POT	TENTIAL ADVERSE ECOLOGICAL IMPACTS ON RECEIVING
STREAMS, GROUNDWATER OR SEWERS.	
NUSUAI Fire and Explosion Hazards HIGH TEMPERATURE FIRE CAN GENERATE H	HCL, PHOSGENE OR PRODUCTS OF PARTIAL
OXIDATION OF THIS PESTICIDE.	
produce locally)	OSHA 174 Sedi 1985
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			ENDRIN						
Section V -	- Reactivity Data								
Stabilin:	Unstable		Cunditions to Avoid	5					
	Stable	x							-
	(Materials to Avoid)		STRONG OX	IDIZERS					
<u> </u>									!
	mpasition or Byprodu					<u> </u>			<u> </u>
Hazardous Polymerization	May Occur		Conditions to Avoid						
	Will Not Occur	x	<u>, , , , , , , , , , , , , , , , , , , </u>	· · · · · · · · · · · · · · · · · · ·					_
Section VI -	- Health Hazard	<u> </u>					- <u></u>		
Roule(s) at Entry	Innai	ation?		Y ABSORBED THROUG		ORAL DOS		N. CAUCTA	
Heatin Hazards	YE	3		ACT SKIN.		CONVULSI			- .
	· · · · · · · · · · · · · · · · · · ·					CONVULSI		IMAILD A	-0.2 MG/K
ORAL LD5	O IN THREE A	NIMAI	. SPECIES					···· ············	-
	ROM 1.4 - 3.		KG.						- İ
Carcinogenicity'	NTP7		A POSS	IARC Monographs? IBLE ANIMAL CARCII	NOGEN		Regulated?		
	. <u> </u>	<u> </u>		ICAL SIMILARITY TO					- '
Signs and Symp:		AND		CTS CHRONICALLY A				· · · · · · · · · · · · · · · · · · ·	-
CNS EFFE	LIS ACUIELI,	AND	LIVER IMPA	CIS CHRONICALLI A	I LOWE		•		-
Aedical Concilion									- ·
	aled by Exposure								
tion VII	Precautions for n in Case Matenal Is 3 ABSORPTIO	Sate Released N ON	Handling and U or Sorred CLAY OR SIM	- REMOVE IMMEDIATH	W-UP W.	ARRANTED	IF MAJ	OR SKIN	- 1
*ion VII to Be Take S.(INTAIN E OR STORM ABSORBED	Precautions for n in Case Material IS 34 ABSORPTION DRAINS NOR (ethod MATERIAL DEM	Safe Released N ON ONTO PENDI	Handling and U or Sorred CLAY OR SIM SOIL SURFAC	JSC MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU	W-UP W. DO NOT	ARRANTED	IF MAJ	OR SKIN OR	- 1
*ion VII to Be Take LONTAIN F OR STORM asse Disposal M ABSORBED AS DETAIL ecautions to Be STORE IN	Precautions for n in Case Material is in 3Y ABSORPTION DRAINS NOR (ethod MATERIAL DEN LED IN THE EN Laten in Mandung an	Safe Released N ON ONTO PENDI PA FI	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT	JSC MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU	W-UP W. DO NOT UNT - 1	ARRANTED -FLUSH I MUST BE	IF MAJ NTO FLO DISPOSE	OR SKIN OR D	CONTACT O
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tion VII	Precautions for In or Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN LED IN THE EN Taken on Mandling an COOL, WELL-V	Safe Released N ON ONTO PENDI PA FI Storn VENTI	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT	JSC MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS.	W-UP W. DO NOT UNT - 1	ARRANTED -FLUSH I MUST BE	IF MAJ NTO FLO DISPOSE	OR SKIN OR D	CONTACT O
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*ion VII to Be Take LONTAIN F OR STORM ABSORBED AS DETAIL ecautions to Be STORE IN Der Precautions ection VIII spratory Protect HERE LEVE	Precautions for n in Case Malenal Is I AY ABSORPTION DRAINS NOR (eihoo MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V Control Measure on (Socoty Type)	Safe Release N ON ONTO PENDI PA FI Storm VENTI i es OR E C USE	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS	JSC MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS.	W-UP W DO NOT UNT - M IKES TO	ARRANTED FLUSH I MUST BE 0 CONTAI	IF MAJ NTO FLO DISPOSE N LEAKS	OR SKIN OR D OR SPIL	CONTACT O
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*ion VII	Precautions for In In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V Control Measure on (Soecty Type) LS APPROACH Cal Exhaust OT APPLICALLY techancal (General) OT APPLICABL ER OR NITRIT	Sate Released N ON ONTO PENDI PA FI Sion VENTI es OR E C USE LE	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS	JSE MEDICAL FOLLOV AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CLV MINIMALLY A CH Special Other SFETY GLASSE	W-UP W DO NOT UNT - M IKES T(HARCOAI	ARRANTED -FLUSH I MUST BE 0 CONTAI 	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI W(HIELDS	OR SKIN OR D OR SPIL F-FACE R DULD BE	CONTACT O
*ion VII	Precautions for In In Case Malenal Is I AY ABSORPTION DRAINS NOR (eihod MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL-V	Safe Release N ON ONTO PENDI PENDI PA FI Storn VENTI es OR E CUSE LE TE LE TY	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D_INDOORS VEK WHERE C	USE MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU TIONS. S WITH CURBS OR DI CLV MINIMALLY A CH Special Correct SFETY GLASSE CLOTHING OR SKIN C	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALL W(HIELDS ARE LIKI	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V CONTROL MEASURE ON (SOCOTY Type) IS APPROACH CCAI Exhaust OT TYPICALLY (CCHANCAI (CONCAR) OT APPLICABL ER OR NITRIT XHMG OF EQUIPMENT OR DISPOSABL LOCS TAMINATED OL	Sate Release N ON ONTO PENDI PENDI PA FI Storn VENTI i es OR E LE LE TE LE TY JTER	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C GARMENTS AN	JSE MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CLV MINIMALLY A CH Special Other SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI WO HIELDS ARE LIKI R ANY EX	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY KPOSED SI	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL	Sate Release N ON ONTO PENDI PA FI Sion VENTI es OR E CE LE TE LE TE DAT	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C SARMENTS AN LEAST ONCE	JSE MEDICAL FOLLOV AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CIV MINIMALLY A CH Special Other Cive Projection SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH Pege 2	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALL W(HIELDS ARE LIKI	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY KPOSED SI	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL	Sate Release N ON ONTO PENDI PA FI Sion VENTI es OR E CE LE TE LE TE DAT	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C SARMENTS AN LEAST ONCE	JSE MEDICAL FOLLOW AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CLV MINIMALLY A CH Special Other SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI WO HIELDS ARE LIKI R ANY EX	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY (POSED SI (-521/45225	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL	Sate Release N ON ONTO PENDI PA FI Sion VENTI es OR E CE LE TE LE TE DAT	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C SARMENTS AN LEAST ONCE	JSE MEDICAL FOLLOV AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CIV MINIMALLY A CH Special Other Cive Projection SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH Pege 2	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI WO HIELDS ARE LIKI R ANY EX	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY (POSED SI (-521/45225	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL	Sate Release N ON ONTO PENDI PA FI Sion VENTI es OR E CE LE TE LE TE DAT	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C SARMENTS AN LEAST ONCE	JSE MEDICAL FOLLOV AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CIV MINIMALLY A CH Special Other Cive Projection SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH Pege 2	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI WO HIELDS ARE LIKI R ANY EX	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY (POSED SI (-521/45225	CONTACT O
*ion VII	Precautions for In Case Malenal Is I AY ABSORPTION DRAINS NOR (MATERIAL DEN ED IN THE EN Taken in Handling an COOL, WELL-V COOL, WELL	Sate Release N ON ONTO PENDI PA FI Sion VENTI es OR E CE LE TE LE TE DAT	Handling and U or Somed CLAY OR SIM SOIL SURFAC NG ON CONCE FRA REGULAT LATED AREAS XCEED THE T D INDOORS VEK WHERE C SARMENTS AN LEAST ONCE	JSE MEDICAL FOLLOV AILAR MATERIAL. I CES ENTRATION AND AMOU CIONS. S WITH CURBS OR DI CIV MINIMALLY A CH Special Other Cyc Projection SFETY GLASSE CLOTHING OR SKIN C ID THOROUGHLY WASH Pege 2	W-UP W DO NOT UNT - M IKES TO HARCOAL	ARRANTED FLUSH I MUST BE O CONTAI L CARTRI H SIDE S IANTION S/FACE O	IF MAJ NTO FLO DISPOSE N LEAKS DGE HALI WO HIELDS ARE LIKI R ANY EX	OR SKIN OR D OR SPIL F-FACE R DULD BE ELY (POSED SI (-521/45225	CONTACT O

MATERIAL SAFETY DATA SHEET				31:9203
Material Salety Data Sheet May be used to comply with USHA's Hazard Communication Standard, 25 CFR 1910.1200. Standard must be insulted for specific requirements.	U.S. Departme Occupational Safety (Non-Mandatory Fo Form Approved OM8 No. 1218-0072	and Health Ad rm)		
ÉNTITY (As Used on Label and Lisi) DIELDRIN	Note: Blank spaces are momation is avai			
Section I		•		<u>,</u>
Manufacturer's Name	Emergency Telephone N	lumber		
Address (Number Sireet, City, State, and ZIP Code)	Telephone Number for Ir	nformation		
	Date Prepared 7/28/95			
	Signature of Preparer (or	olional)		
	A.S. TODD	<u> </u>		
Section II — Hazardous Ingredients/Identity Informa	ation			
Hazardous Components (Specific Chemical Identity; Common Name	e(s)) OSHA PEL ACC	SIH TLV F	Other Limits Recommended	l ais lophonall
DIELDRIN (PESTICIDE) NO LONGER MANUI	FACTURED 0	.25 MG/M3		
IN THE U.S.				······································
A 12 CARBON HEXACHLORO DERIVATIVE				
OF NAPHTHLENE	•		<u></u>	
	······			······
	······································			
		· · · · · · · · · · · · · · · · · · ·		
				······
ection III — Physical/Chemical Characteristics	Specific Gravity (H ₂ O = 1)			
ection III — Physical/Chemical Characteristics	Specific Grawty (H ₂ O = 1)			1.2
DECOMPOSES ON BOILING	Specific Gramty (H ₂ O = 1) Metting Point			1
DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F.	Metting Point			1
DECOMPOSES ON BOILING				1
Ning Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Nublity in Water	Metting Point Evaporation Rate			176 DEGREES
Ming Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR - 1) 12+ UDHITY IN WATER VERY SLIGHTLY SOLUBLE	Metting Point Evaporation Rate			176 DEGREES
Ning Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Nublity in Water	Metting Point Evaporation Rate			176 DEGREES
Ming Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Wolkity in Water VERY SLIGHTLY SOLUBLE pearance and Coor	Metting Point Evaporation Rate			176 DEGREES
Ming Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Workty in Water VERY SLIGHTLY SOLUBLE pearance and Coor VERY SLIGHT HYDROCARBON ODOR	Metting Point Evaporation Rate	LE		176 DEGREES
Along Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Worky in Water VERY SLIGHTLY SOLUBLE pearance and Odor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC inguishing Mec.a	Metting Point Evaporation Rate (Butyl Acetate = 1)			176 DEGREES
Along Point DECOMPOSES ON BOILING por Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. por Density (AIR = 1) 12+ Worky on Water VERY SLIGHTLY SOLUBLE pearance and Occor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC inguishing Mec.a CO2 FOAM, DRY CHEM, WATER	Metting Point Evaporation Rate (Buryl Acetate = 1) Flammable Limits		<u>_</u>	176 DEGREES
Alling Point DECOMPOSES ON BOILING DOP Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. DOP Density (AIR - 1) 12+ VERY SLIGHTLY SOLUBLE Dearance and Coor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC inguisting Mec.a CO2 FOAM, DRY CHEM, WATER CO2 FOAM, DRY CHEM, WATER CO3 Fire Fign: nc Procedures DT READILY COMBUSTIBLE BUT IN A FIRE	Metting Point Evaporation Pate (Buryl Acetate = 1) Flammable Limits BOTH DIELDRIN, HCI		<u>_</u>	UEL
Alling Point DECOMPOSES ON BOILING Der Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. DOD Density (AIR - 1) 12+ Wolkty in Water VERY SLIGHTLY SOLUBLE Dearance and Coor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC inguishing Mecia CO2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co31 Fire Figning Procedures DT READILY COMBUSTIBLE BUT IN A FIRE IRBORNE IN SIGNIFICANT HEALTH EFFECTS	Metting Point Evaporation Pate (Butyl Acetate = 1) Flammable Limits BOTH DIELDRIN, HCI S CONCENTRATION	L AND PHOS	GENE WO	UEL
Alling Point DECOMPOSES ON BOILING Der Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. DOD Density (AIR - 1) 12+ VERY SLIGHTLY SOLUBLE Dearance and Coor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC Inguisting Mec.a CO2 FOAM, DRY CHEM, WATER Scial Fire Fighting Procedures CO2 FOAM, DRY CHEM, WATER Scial Fire Fighting Procedures DT READILY COMBUSTIBLE BUT IN A FIRE IRBORNE IN SIGNIFICANT HEALTH EFFECTS ISUAL Fire and Explosion Hazards ATER USAGE SHOULD BE LIMITED BECAUSE	Metting Point Evaporation Pate (Butyl Acetate = 1) Flammable Limits BOTH DIELDRIN, HCI S CONCENTRATION	L AND PHOS	GENE WO	UEL
Alling Point DECOMPOSES ON BOILING Der Pressure (mm Hg) .1 X 10-7 MM/HG AT 68 DEGREES F. DOD Density (AIR - 1) 12+ Wolkty in Water VERY SLIGHTLY SOLUBLE Dearance and Coor VERY SLIGHT HYDROCARBON ODOR ction IV — Fire and Explosion Hazard Data sh Point (Method Used) 300 DEGREES + COC inguishing Mecia CO2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co2 FOAM, DRY CHEM, WATER Co31 Fire Figning Procedures DT READILY COMBUSTIBLE BUT IN A FIRE IRBORNE IN SIGNIFICANT HEALTH EFFECTS	Metting Point Evaporation Pate (Butyl Acetate = 1) Flammable Limits BOTH DIELDRIN, HCI S CONCENTRATION	L AND PHOS	GENE WO	UEL

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Section V -	Reactivity Data	l I	
Stability:	Unstable	Ι	Conditions to Avoid
i	Slable	X	STORE AWAY FROM STRONG OXIDIZERS
Incompatibility (Materials to Avoid)	.	
Hazardous Decor	DOSTION OF Byprodu		ODUCTS OF PARTIAL OXIDATION
Hazardous	May Occur		Conduons to Avoid
Polymerization	Will Not Occur	x	
Section VI -	Health Hazard		
Route(s) of Entry	ACUTE AN	ation?	RONIC ACUTE ABSORPTION HIGHLY'TOXIC
Heann Hazards /ACUTE LD50	Cure and Crone; RODENTS 38		
NERVOUS SY	STEM EFFECT	S AC	UTELY OR CHRONICALLY. LIVER IMPACTS ARE SECONDARY. THIS
COMPOUND A	ABSORBS READ	ILY	THROUGH THE SKIN.
Carcinogenicity: YES_IN	NTP?		IARC Monographs? OSHA Regulated? SPECTED IN MAN.
	SEA, HYPER I	_	ABILITY, HEADACHE, MUSCLE SPASM AND POSSIBLE CONVULSION
		YSTE	MIC DOSES BY THE INHALATION, DERMAL OR ORAL ROUTES OF EXPOSURE.
Medical Conditions Generally Aggrava		CNS	, OR LIVER FUNCTION
EYES FLUS IMMEDIATEL MATICALLY	HED WITH WA	TER POIS OR M	FOR 15 MINUTES AND CONSULT PHYSICIAN. ORAL - INDUCE VOMITING AND ON CONTROL CENTER. INHAL - REMOVE FROM EXPOSURE. TREAT SYMPTO- EDICAL TREATMENT/EVALUATION. DERMAL - REMOVE CONTAMINATED CLOTHING
Section VII -	Precautions for	Safe	Handling and Use AND THE MATERIAL FROM THE SKIN WITH SOAP/WATER. FOLLOW
Steps to Be Taken CONTAIN BY	In Case Material Is ABSORPTION	Release ON	Or Somed W/MEDICAL CONSULTATION. CLAY OR SIMILAR MATERIAL. DO NOT FLUSH INTO FLOOR OR STORM!
DRAINS NOR	ONTO SOIL	SURF	ACES
Waste Disposal Me ABSORBED_M	ATERIAL DEP	ENDI	NG ON CONCENTRATION AND AMOUNT - MUST BE DISPOSED AS DETAILED
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	REGULATION		
	aken in Handling an OOL, WELL-V		ATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS.
Other Precautions	i		
	•		
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Section VIII	Control Measur	es	
WHERE LEVEL	S APPROACH (CEED THE TLV MINIMALLY A CHARCOAL CARTRIDGE HALF-FACE RESPIRATOR
	cal Exhause THIS T TYPICALLY		
M	echanical (General) OT APPLICAB		Other
Protective Gloves	R OR NITRILI		VES. SAFETY GLASSES WITH SIDE SHIELDS
Other Protective Clot	thing or Equipment		
Work/Hypener Pract	(VEK WHERE CLOTHING OR SKIN CONTAMINATION ARE LIKELY.
	AMINATED OUT	_	CARMENTS AND THOROUGHLY WASH HANDS AND FACE OR ANY EXPOSED SKIN.
			YPE Occupational Safety & Health Reporter 14
INDUSTRIAL			

Material Safety Data Sheet May be used to comply with USHA'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 Laber and List) HEPTACHLOR	Note: Blank spaces are not permitted, if any item is not applicable, or ins information is available, the space must be marked to indicare that
Section I	
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	A.S. TODD
Hazaroous Components (Specific Chemical Identity; Common Name(s))	Ciner Limits OSHA PEL ACGIH TLV 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 CHLORI	NATED PESTICIDE
· · ·	
*READILY ABSORBED THROUGH THE INTACT S	KIN
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د مریک میں میں میں ایک میں میں میں میں میں میں میں میں میں میں	
Section III — Physical/Chemical Characteristics	
	Specific Grawry (H2O = 1)
<u>135 – 145 DEGREES C</u>	1.2
Vacor Pressure (mm Hg) 3 X 10-4 MM/HG AT 68 DEGREES F	96 DEGREES C
	vaporation Pate
	Buryl Acetale - 1) NEG
INSOLUBLE Appearance and Coor	······································
FAINT CHEMICAL ODOR	
Section IV - Fire and Explosion Hazard Data	
	lammable Limits LEL UEL
OVER 300 DEGREES F COC	i
Emogustrong Mecca <u>CO2</u> FOAM, DRY CHEM, WATER	
Special Fire Figure Processing	
WATER NOT RECOMMENDED WHERE THE COMPOUN	D MAY REACH STREAMS OR RESULT IN SOIL OR
GROUND WATER CONTAMINATION	
AT HIGHER TEMPERATURE THE COMPOUND IS VO	LATILE AND CAN RESULT IN PRONOUNCED
CNS EFFECTS SUCH AS CONVULSIONS. HCL AN	D PHOSGENE CAN ALSO BE GENERATED.
Yoduce locally)	OSHA 174 Sedt 1985
5-8-86 Published by THE BUREAU OF NATIONAL AF	FAIRS, INC., Washington, D.C. 20037 13

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Section V -	- Reactivity Dat			
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	-cule and Chronic) (IC IN SMALL <u>YES. READILY ABSORBEN</u> ITIES AS DUSTS THROUGH INTACT SKIN	D ORALLY TOXIC RAT LD50 40-188 MG/KG.
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MATERIAL	SAFETY	DATA	SHEET
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Material Safety Data Sheet May be used to comply with OSHA's Hazard Communication Standard, 25 CFR 1910.1200, Standard must be consulted for specific requirements.

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5-210 31:9203

IDENTITY (As Used on Laber and List) 4,4 D D D	Note: Blank spaces are not permitted, if any item is not applicable, or no information is available, the space must be marked to indicare that
Section I	
Manufacturer's Name	Emergency Telephone Number

NO LONGER MANUFACTURED IN THE U.S.		
Address (Number Street, City, State, and ZIP Code)	Telephone Number for Information	-
	Date Prepared 7/31/95	-
	Signature of Preparer (opinonal) A.S. TODD	

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s)) OSHA PEL ACGIH TLV Recommended
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 Boling Point Specific Grawny (H₂O = 1) 350[°]F ESTIMATED AT OVER ESTIMATED AT 1.5 LESS THAN I X'105 MM/HG AT 68 DEGREES F Metting Point N.A Vapor Density (AIR + 1) Evanoration Rate NEGLIGIBLE GREATER THAN 8 (Burn Acetate = 1) Southy on Water INSOLUBLE Appearance and Coor FAINT CHLORINATED HYDROCARBON ODOR IN CONCENTRATED FORM Section IV - Fire and Explosion Hazard Data Plash Point (Method Used) Flammable Limits LEL UEL IN EXCESS OF 300 DEGREES F COC Extinguishing Mecia CO2, FOAM DRY CHEM, OR WATER Sc 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

produce locally)

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MATERIAL SAFETY DATA SHEET					5-210 31:9203
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Section II — Hazardous Ingredients/Iden	tity Informati	ion		Ciner Limits	
Hazardous Components (Specific Chemical Identity: C	Common Name(s)	» Osha pel	ACGIH TLV	Recommende	
1,1 DICHLORO 2,2 BIS CH	LOROPHENY	<u>'L ETHYLENE (</u>	DDE)		
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IS A RECOMMENDED GUIDELI	INC.	·			
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Jupility in Water	. <u> </u>				- <u>*</u> _, _
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Section V - Reactivity Data Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: Unators Super: U	31:9204	4,4 D	D E	REFERENCE FILE
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May be used to comply with OSHA's Hazard Communication Standard, ど 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 Lader and Lisi) ALDRIN	Note: Blank spaces are not permitted, if any item is not applicable, or no information is available, the space must be marked to indicare that
Section I	
Manufacturer's Name NOT CURRENTLY MANUFACTURED IN THE U.S.	Emergency Telephone Number
Address (Humber, Sireet, 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 Informatio	<u></u>
Hazardous Components (Specific Chemical Identity: Common Name(s))	Other Limits OSHA PEL ACGIH TLV Recommended % (optiona
1,2,3,4,10,10 HEXACHLORO	0.25 MG/M3*
1,4,4,588 HEXAHYDRO	
1,4,58 DIMETHANO NAPHTHALENE	
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REFERENCE FILE

Section V -	Reactivity Da	ta	
Stabring	Unstable		Conditions to Avoid
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Incompatibility	Materials to Avoid	n	
Hazardous Deco HCL AND	mossion or Bypro	tucts	
Hazardous Polymerization	May Occur		Conditions to Avoid
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Section VI -	Health Hazard		
Route(s) of Entry	Linn YE	alation?	READILY ABSORBED LD50 RATS 60 MG/KG
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INHALATIC	ON OF THE S	PRAY	OR MIST AND DERMAL ABSORPTION
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Section VII -	Precautions for	or Safe	Handling and Use CONSULTATI
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RAINS NOR	ONTO SOIL	SURF	ACES
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	Taken in Handling COOL, WELL		ILATED AREAS WITH CURBS OR DIKES TO CONTAIN LEAKS OR SPILLS
ther Precautions		i	
ection VIII -	Control Measu	ires	· · · · · · · · · · · · · · · · · · ·
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ΓM	echanical (General)		EXHAUST IS FEASIBLE
Rective Gloves	NOT APPLICA		Sye Protection
her Protective Cio	ER OR NITRI		SAFETY GLASSES WITH SIDE SHIELDS
rk/Hygienic Pract	ces		VVEK WHERE CLOTHING OR SKIN CONTAMINATION ARE LIKELY
			ARMENTS AND THOROUGHLY WASH HANDS, FACE, ANY EXPOSED SKIN. LEAST ONCE Page 2
_			YPE Occupational Safety & Health Reporter 14
DUSTRIAL (CHEMICAL		

					31:9203
Material Safety Data Sheet May be used to comply with OSHA's Hazard Communication Standard, 25 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			
NTITY (As Used on Label and List) 2,4,5 T			ces are not permitte I is available, the sc		
Section I		·····			
Manulacturer's Name UNKNOWN		Emergency Teler	phone Numbér		
Address (Number Sireer, City, State, and ZIP Code)		Telephone Nump	er for information		
		Date Prepared 7/31/			······
		Signature of Prec A.S.			
Section II - Hazardous Ingredients/Iden	ntity Informatio	Я	r		
Hazaroous Components (Specific Chemical Identity: (Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommende	
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(WEEDONE)		OSHA LIMI	I 10 MG/M3		
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	ristics 540 [°] F	Specific Gravity (H2	D - 1)		1.15
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Section V -	- Reactivity Data	3					
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Hazardous Polymerization	May Occur	ļ	Conditions to Avoid		•		-
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	Health Hazard						
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Heath Hazards (A	cute and Chronici	VEIG	T LOSS AND	OF DERMAL EFI EXCEPT MINOR	ECIS	F	ROM 100-1000 MG/H
	I	POSS	BLE KIDNEY IMPA	CTS			
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Medical Conditions		 т т х	ER OR KIDNEY DI	SFASE	·		······································
Generally Aggravat	ed by Exposure		ER OK RIDNET DI				<u> </u>
Emergency and Fir	St Ard Procedures		~ <u>~~~</u>	<u> </u>			
FLUSH EYES	5 OUT FOR 15		. WHERE CONTACT				SKIN USING LIBERA
WASHING W/	SOAP/WATER.	RE	MOVE FROM EXPOS	URES TO MISTS	IF GENERAT	ED AND TREAT	I SYMPTOMATICALLY
			Handling and Use	<u> </u>			
SORB WIT	H CLAY, CAR	BON	OR RELATED CHEM	ICAL ABSORBANT	S	•	
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EPA APPROV	FD LANDFILL	S OR	INCINERATION D	EPENDING ON AM	OUNTS AND	CONCENTRATIC	DN.
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STORE IN C	COOL, DRY, V	ENII	LAILD AKEA		<u> </u>	<u></u>	
Other Precautions				<u></u>			i
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	Control Measure						· ·
		_	CIDE CARTRIDGES				
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notective Gloves				Eye Protection			
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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 scap 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 Page 2 of 4 TECHNICAL CHLORDANE

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 HCI, 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	t 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
Bolling Point	349*F ©2 mmHg. Decomposes before boiling at atmospheric conditions.
Vapor Pressure	1 x 10" mmHg at 25°C (77"F).
Vapor Density	13.2 (Air = 1)
Specific Gravity	1.63 at 25°C (H ₂ 0 = 1)
Solublity	Insoluble in water. Miscible in xylene, alcohols, chlorinated solvents.
Evaporation Rate	>2.0 (Toluene = 1).
Stablilty	Stable.
Reactivity	Slowly dehydrohalogenates in strong alkali.
Decomposition Products	None known.

Page 4 of 4 TECHNICAL CHLORDANE

HEALTH HAZARD	TECHNICAL AND SUPPORTING INFORMATION
INFORMATION	
Primary Route(s) of Entry	ORAL: No, inhalation: Yes, Dermal/Eys: 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' convulsions, confusion, incoordination, excitability, or coma. In eyes, may cause' irritation. 'Based on acute polsoning cases and animal studies. 'Based on results in animal studies.
Acute Toxicity: Oral	LD _{so} in rate has been reported as low as 133 mg/kg and as high as 649 mg/kg.
Dermal	LD _{so} in rabbits is greater than 200 mg/kg but <2000 mg/kg.
inhalation	LC, 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 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. Th central nervous system and liver appear to be the target organs. The lowest observed effect level (LOEL) with chronic ingestion exposure (live 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 RCRA	Regulated. Reportable quantity 1 lb. (0.45kg).
CWA	Hazardous waste when disposed. Regulated.
	Subject to reporting requirements of 40CFR 355.
	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%

The information presented herein, while not guaranteed, was prepared by technically knowledgeable personnel and to the best of our knowledge is true and accurate. It is not intended to be all inclusive and the manner and conditions of use and handling may involve other or additional considerations. The information provided herein is applicable only to Technical Chlordane. As manufactured by/for Velsicol Chemical Corporation.



New York State Department of Environmental Conservation

John

MEMORANDUM

TO:Michael J. Cruden, West Field Services, BCS, DERFROM:John R. Strang, O&M Section, BHSC, DERSUBJECT: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:

- <u>1.1 Project Description</u>. Replace the last sentence with "The remedy was completed in September 1997 and the site is in the monitoring and maintenance phase."
- <u>4.3 Evaluation of Monitoring Reports</u>. 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."
- <u>5.2 Inspection and Maintenance</u>. 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.
- <u>6.1.1 Emergency Contacts</u>. Change the NYSDEC Albany Office telephone number to 518-457-0927.
- <u>Appendix B</u>. Include the boring log for the just installed monitoring well.

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

R. Strang

Project Engineer

Attachments

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

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•				APPENDIX others Site	e #7-04 -0		PAGE	OF
		GROU		SAMPLI				
SAMPLE		·				·····		
LOCATION		PLICATE COLLECTER		ACTIVITY STA	RT	ENO		
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ALM BROTHERS SITE # 7-04-021

INSPECTION REPORT FORM

OVERALL SITE

	ICE/GATE COND	TION	હ્ ৫৩)	FAIR	PUOR	LUCKED?		
EVID	HNAGE PROBLE ENCE OF THE PAY ANY CHANGES IN VIE	GR	OUNDWATER MONIT	NO ORIN Y BR	G SYSTED OTHERS S TE NO. 7-0	ITE-	ITEN	1S-
I	nspection Area		Item Noted		А	ction		Preventive Maintenance
1.	Caps WM_	- a ,	Cracked or broken	•	Replace.		•	Check during sampling
2.	Locks Wull	a_ _b, c,	Will not open Rusted Different key for each well	•	•	en and replace. with the same lock	•	Lubricate during sampling
3.	Surface seals	a.	Cracked	•	Re-grout		•	Inspect during sampling
4.	Markings	a. b.	None Mislabeled	•	Remark.			·/
5.	Water Level (semiannually)	a. b. Wcll	Dry Silted in or blocked DLC-Z. DLC-GS DLC-GS DLC-GD DLC	•	redrilling is warran DEC/DC redrilling	H to determine if is warranted. in-place and/or	•	Check during sampling

INSPECTINK

DATE

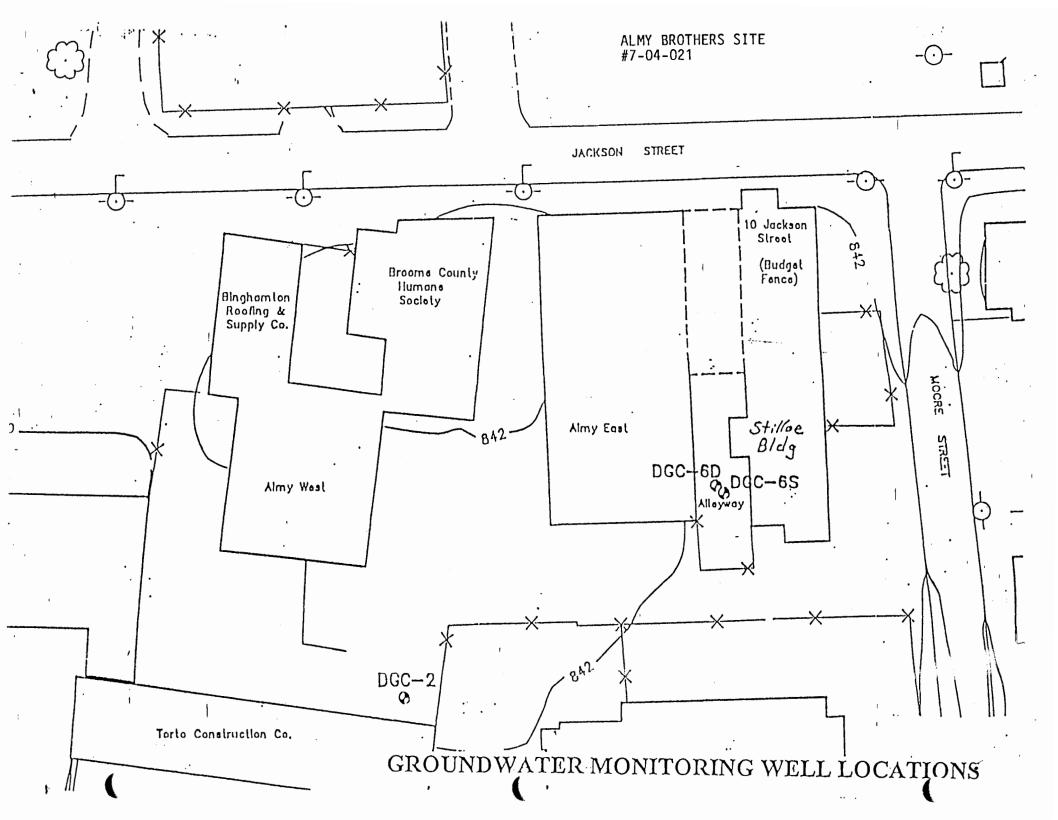


FIGURE 2

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

