Focused Site Inspection
Prioritization Report

American Cyanamid Company
USEPA ILD 000 675 264

September 5, 1996

930480

EPA Region 5 Records Ctr.
288881

BLACK & VEATCH Waste Science, Inc.

MEMORANDUM

USEPA Region V
FSIP
American Cyanamid
Results of Residential Well Sampling

BVWS Project 71380.104
BVWS File D.1
December 13, 1995

To: File

From: Mona Reints

Introduction

This report addendum was prepared to accompany the American Cyanamid focused site inspection prioritization (FSIP) report dated September 19, 1995. The site is owned and operated by Cytek Industries. On November 20, 1995, Marc Cummings, Illinois Environmental Protection Agency remedial project manager, Pre-Notice Program, indicated the site had entered into the program.

Six residential well samples were collected on August 31, 1995, during the final phases of initial report preparation. This report addendum summarizes those findings.

Groundwater Pathway

Three principal water-bearing units are used as sources of water near the site. The three aquifers in descending order are a Quaternary sand and gravel drift deposit, a Silurian dolomite bedrock formation, and the Cambrian-Ordovician aquifer system, which consists of hydraulically connected Ordovician and Cambrian dolomite and sandstone formations.

According to well logs in the area, the Quaternary drift aquifer and the Silurian dolomite bedrock aquifer are hydraulically connected, forming the aquifer of concern. The Ordovician Maquoketa shale formation, a regional aquitard that is approximately 50 feet thick, lies between the aquifer of concern and the lower Cambrian-Ordovician aquifer system (Woller and Sanderson 1983).

The Quaternary drift deposit, ranging in thickness from 5 to 100 feet, is composed of interbedded till units, lacustrine clay deposits, and water-bearing sand and gravel units. The Silurian dolomite bedrock formation varies in thickness from 100 to 150 feet (Hughes, Kraatz, and Landon 1966). The thickness of the Cambrian-Ordovician aquifer system is approximately 750 feet.

Area residents use water from either private or municipal groundwater wells. A review of Illinois State Water Survey database information suggests that area wells are finished in the Silurian dolomite bedrock. Domestic wells, commercial/industrial wells, and wells serving mobile home parks and the city of Joliet are within 4 miles of the site. No area wells are believed to be finished in the Quaternary drift or

-0076

Cambrian-Ordovician aquifers. The nearest drinking water wells, located at private residences across from the northern and western site borders, are approximately 0.1 mile from the site. Private wells within a 4 mile radius of the site serve an estimated 5,133 people.

Residential Well Sampling

On August 31, 1995, the ARCS contractor field team collected spilt samples with Golder Associates, the consultant for American Cyanamid. Six nearby residential wells were sampled. Residential well sample RW01 was collected north of the site at a McKinley Avenue residence. Residential well sample RW02 was collected north of the site at a second McKinley Avenue residence. Residential well sample RW03 was collected north of the site at a home on Patterson Road. Residential well sample RW04 was collected northwest of the site at a second Patterson Road residence. Residential well sample RW05 was collected west of the site at a Champlain Street home. Residential well sample RW06, the background well, was collected west of the site at Keuka Street residence.

Residential well depths are unknown, but are assumed to be screened in the aquifer of concern. It is also unknown whether any of the samples were collected before treatment systems. Figure 1 shows each sample location. Appendix A presents FSIP analytical data; Appendix B presents site photographs.

Sample jars were sealed, labeled, packaged, and transported to USEPA Contract Laboratory Program participant laboratories in accordance with procedures set forth in the quality assurance project plan (QAPjP).

Residential well samples scheduled for organic and inorganic analyses were shipped to Envirosystems in Columbia, Maryland, on August 31, 1995, and September 1, 1995. Samples were analyzed for Target Compound List and Target Analyte List substances under a special analytical services request.

Reusable sampling equipment and personal protective equipment (PPE) were decontaminated before transport offsite. Disposable sampling and PPE items were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.

Analytical Results and Key Samples

Laboratory analysis of residential well samples revealed two metals are present.

Key samples are samples that contain substances in sufficient concentration to document an observed release. Table 1 identifies FSIP key samples. Key samples revealed the presence of calcium and manganese.

Table 1
Key Sample Summary

Groundwater (concentrations in µg/L)			
Substance	RW01	RW03	RW06 Background
Calcium		372,000	113,000
Manganese	48.2	543	8.9

References

Hughes, George M., Paul Kraatz, and Ronald Landon, 1966, Bedrock Aquifers of Northeastern Illinois, Illinois State Water Survey, Urbana, Illinois.

Woller, Dorothy M., and Ellis W. Sanderson, 1983, Public Groundwater Supplies in Will County, Illinois State Water Survey, Champaign, Illinois.

PAGE REMOVED
DUE TO
PII

Appendix A

American Cyanamid Company

Analytical Data

Table A-1
Volatile Organic Analysis for Residential Well Samples
American Cyanamid

Volatile Compound	Sample Locations and Number Concentrations in µg/L					
	RW01	RW02	RW03	RW04	RW05	RW06 Background
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Disulfide	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
Styrene	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U
Total Number of TICS *	0	0	0	0	0	0

* Number, not concentrations, of tentatively identified compounds (TICs).

RW-vol.wk4

Table A-2
Semivolatile Organic Analysis for Residential Well Samples
American Cyanamid

Semivolatile Compound	Sample Location and Number Concentrations in µg/L					
	RW01	RW02	RW03	RW04	RW05	RW06 Background
Phenol	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethyl)Ether	5 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	5 U	5 U	5 U	5 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	5 U	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	5 U	5 U	5 U	5 U	5 U	5 U
n-Nitroso-Di-n-Propylamine	5 U	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Isophorone	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)Methane	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-Methylphenol	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U	20 U	20 U
2-Chloronaphthalene	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	20 U	20 U	20 U	20 U	20 U	20 U
Dimethyl Phthalate	5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	5 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	20 U	20 U	20 U	20 U	20 U	20 U
Acenaphthene	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U	20 U	20 U
Dibenzofuran	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	5 U	5 U	5 U	5 U	5 U	5 U
Fluorene	5 U	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ
4,6-Dinitro-2-Methylphenol	20 U	20 U	20 U	20 U	20 U	20 U
n-Nitrosodiphenylamine	5 U	5 U	5 U	5 U	5 U	5 U

Table A-2 (Continued)
Semivolatile Organic Analysis for Residential Well Samples
American Cyanamid

Semivolatile Compound	Sample Location and Number Concentrations in µg/L					
	RW01	RW02	RW03	RW04	RW05	RW06 Background
4-Bromophenyl-phenylether	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	20 U	20 U	20 U	20 U	20 U	20 U
Phenanthrene	5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	5 U	5 U	5 U	5 U	5 U	5 U
di-n-Butylphthalate	5 U	5 U	5 U	5 U	5 U	5 U
Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U
Pyrene	5 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	5 U	5 U	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)Anthracene	5 U	5 U	5 U	5 U	5 U	5 U
Chrysene	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Ethylhexyl)Phthalate	5 U	5 U	5 U	5 U	5 U	5 U
di-n-Octyl Phthalate	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(b)Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)Pyrene	5 U	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)Pyrene	5 U	5 U	5 U	5 U	5 U	5 U
Dibenzo(a,h)Anthracene	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,i)Perylene	5 U	5 U	5 U	5 U	5 U	5 U
Total Number of TICs *	0	0	0	0	0	0

* Number, not concentration, of tentatively identified compounds (TICs).

Table A-3 Pesticide/PCB Analysis for Residential Well Samples American Cyanamid						
Pesticide/PCB	Sample Locations and Number Concentrations in µg/L					
	RW01	RW02	RW03	RW04	RW05	RW06 Background
Alpha-BHC	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Beta-BHC	0.010 UJ	0.010 UJ	0.010 UJ	0.010 UJ	0.010 UJ	0.010 UJ
Delta-BHC	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Gamma-BHC (Lindane)	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Heptachlor	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Aldrin	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Heptachlor Epoxide	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Endosulfan I	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Dieldrin	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDE	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endrin	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endosulfan II	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDD	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endolsulfide sulfate	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDT	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Methoxychlor	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin ketone	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endrin aldehyde	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Alpha Chlordane	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Gamma-Chlordane	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Toxaphene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1016	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Aroclor 1221	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Aroclor 1232	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Aroclor 1242	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Aroclor 1248	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Aroclor 1254	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Aroclor 1260	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

s:\proj\FSIP\am-cyn\data\rw-pest.wk4 + disk

A-4

Table A-4
Inorganic Analysis for Residential Well Samples
American Cyanamid

Metals and Cyanide	Sample Locations and Number Concentrations in µg/L					
	RW01	RW02	RW03	RW04	RW05	RW06 Background
Aluminum	28.4 BJ	32.9 BJ	32.2 BJ	38.1 BJ	34.4 BJ	40.5 BJ
Antimony	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
Arsenic	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Barium	18.7 B	19.6 B	14.5 B	20.6 B	21.1 B	24.8 B
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Calcium	262000	152000	372000	130000	110000	113000
Chromium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 B
Cobalt	2.0 U	2.0 U	2.8 B	2.0 U	2.0 U	2.0 U
Copper	2.5 BJ	8.5 B	12.1 B	14.7 B	4.9 BJ	34.5
Iron	686	20.0 U	374	20 U	525	1600
Lead	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Magnesium	159000	79500	405000	70000	58500	59000
Manganese	48.2	1.0 U	543	3.7 B	9.7 B	8.9 B
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	6.2 BJ	2.0 U	12.2 BJ	2.2 BJ	4.4 BJ	2.5 BJ
Potassium	9700	6550	16800	5210	4880 B	3040 B
Selenium	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Silver	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sodium	39100	33000	66100	23000	16500	20300
Thallium	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Vanadium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	39.8 J	75.6 J	16.4 J	22.1 J	22.0 J	37.8 J
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

s:\proj\FSIP\am-cyan\data\rw-metal.wk4

Appendix B

American Cyanamid Company

Site Photographs

6 PAGES
REDACTED
DUE TO
PII