

## DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

### RCRA Corrective Action Environmental Indicator (EI) RCRAInfo code (CA725) Current Human Exposures Under Control

**Facility Name:** American Cyanamid Company Agricultural Research Division  
**Facility Address:** Quakerbridge and Clarksville Roads, West Windsor, New Jersey  
**Facility EPA ID#:** NJD002349009

#### **Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EIs developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

#### **Definition of “Current Human Exposures Under Control” EI**

A positive “Current Human Exposures Under Control” EI determination (“YE” status code) indicates that there are no unacceptable human exposures to “contamination” (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

#### **Relationship of EI to Final Remedies**

While Final remedies remain the long-term objectives of the RCRA Corrective Action program, the EIs are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The “Current Human Exposures Under Control” EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program’s overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

#### **Duration / Applicability of EI Determinations**

EI Determination status codes should remain in the RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

#### **Facility Information**

American Cyanamid Company (ACCo) has operated an agricultural chemical research and development facility at this location since 1957. The site is located on a 640-acre property in a mixed area of commercial, residential, and open land uses. The site and surrounding area are partially developed. The site is bordered to the east by the Pennsylvania Railroad right-of-way, to the west by U.S. Highway 1, to the south by Quakerbridge Road, and to the north by open land and the floodplain of Duck Pond Run.

Historical site operations have included agricultural chemical laboratory research and development, raising of experimental crops and livestock, and chemical and nutrient testing on crops and livestock. Facility infrastructure has included surface impoundments, wastewater treatment operations, underground and aboveground storage tanks, loading/unloading areas, a drum and container storage area, sanitary and storm water sewer systems, and two landfills.

ACCo filed a Part A permit application in 1980 for interim status storage and treatment of hazardous wastes in containers. A revised Part A was filed by the facility in 1985 for container storage of chlorinated and non-chlorinated solvents, reactive compounds, and chemical reagents for chemical experiments and laboratory analyses. ACCo received a Part B Permit for the storage of up to 11,640 gallons of containerized hazardous waste (mainly solvents). In addition, the facility registered two unlined landfills (Landfill No. 1 and Landfill No. 2) under the CERCLA Hazardous Waste Notification Requirements. The facility also held a permit for wastewater discharge to surface water at two outfalls (DSN 001 and DSN 002). These systems are now connected to the on-site waste water treatment plant (WWTP).

A RCRA Facility Assessment (RFA) was performed at the ACCo site in 1985. The RFA identified 4 Solid Waste Management Units (SWMUs) and 16 Areas of Concern (AOCs) that required further evaluation for releases of hazardous wastes or hazardous constituents. SWMUs at the site include two landfills and two discharge ditches for wastewater outfalls. AOCs include a formulation washdown tank, a 10,000-gallon diesel fuel underground storage tank (UST), a detonation area for destruction of reactive chemicals, 2 streams adjacent to the discharge ditches for wastewater outfalls, and 11 petroleum USTs. NJDEP issued an Administrative Consent Order (ACO) in 1990 which required investigation of potential releases from the SWMUs and AOCs. RCRA Facility Investigation (RFI) activities were performed from 1990 through 1992. The results of the RFI indicated that only the landfills required further investigation and cleanup. The Corrective Measures Study (CMS) for corrective action at the landfills was performed in 1992. Based on the CMS findings, wastes were excavated from both landfills for off-site treatment and disposal. Remedial actions were completed in 1995, and documented in the Remedial Action Report (RAR). Since completion of the remedial action, NJDEP has required quarterly groundwater monitoring of five wells at the site to document natural attenuation of groundwater contamination found in the shallow aquifer beneath and downgradient from Landfill No. 2 (SWMU 2).

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

- If yes - check here and continue with #2 below.
- If no - re-evaluate existing data, or
- If data are not available skip to #6 and enter IN (more information needed) status code

**Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs):** The RFI, CMS, and remedial actions at ACCo **have been performed with NJDEP oversight. During these studies, soil, surface water, biota, and sediment samples have been collected and 12 wells have been installed and monitored on site. During the course of investigations the following four 4 SWMUs and 16 AOCs have been identified at the property. A SWMU/AOC map is found in Attachment 1.**

**SWMU 1, Landfill No. 1:** This unit was located in the north-central portion of the site and was used until the 1970s for disposal of solid wastes, including vegetative matter and construction debris. Wastes were placed in a mound that covered an area of approximately 1,800 square feet and then covered with soil (Ref. 1). During the RFI, zinc was detected in soil and iron and manganese were detected in groundwater, both above relevant standards (Ref. 1). Background sampling indicated that the elevated iron and manganese concentrations detected in groundwater at the landfill were naturally occurring. Soil in the area of the elevated zinc sample was excavated, stockpiled, and disposed during the remedial action implemented in 1994 and 1995 (Ref. 2). Confirmatory soil sampling did not detect any hazardous constituents above the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC). A total of 327 tons of contaminated soil, asbestos tiles, and chemical containers were excavated from the landfill, and shipped off site to a commercial disposal facility. In addition, five small containers (1-gallon or smaller) of unknown liquid were excavated from the landfill and overpacked in 5-gallon lab packs. The contents were characterized and labeled as solvents prior to off-site disposal at a commercial hazardous waste facility. The excavated area was regraded and planted with grass seed. The area is currently an open vegetated area. An unconditional no further action determination was granted by NJDEP for the former Landfill No. 1 site on April 28, 1997.

**SWMU 2, Landfill No. 2:** This unit was located in the south-central portion of the site, immediately north of outfall DSN 001 (SWMU 3). This unit was formerly used for the disposal of laboratory wastes generated at the facility (Ref. 1). The unit consisted of two disposal trenches, excavated and used for disposal of laboratory wastes in various containers from the 1960s until the early 1970s. During landfill operations, wastes including containers of spent non-halogenated solvents (F003 and F005) and pesticides (U060 and U061) were covered with soil to the existing grade. During the RFI, the extent of the landfill was determined through a ground penetrating radar survey and excavation of test pits. Soil sampling indicated the presence of chloroform, 4,4-DDT, and toxaphene above NJ RDCSCC. Groundwater monitoring at this unit detected volatile organic compound (VOC) contamination above the New Jersey Class II Groundwater Quality Criteria (NJ GWQC) for chloroform, 1,2-dichloroethane, and carbon tetrachloride. Pesticides detected in groundwater above the NJ GWQC included alpha-benzene

hexachloride (Alpha-BHC), gamma-benzene hexachloride (Gamma-BHC), and 4,4'-DDE. Corrective measures implemented at this unit include excavation of wastes and contaminated soil and ongoing groundwater monitoring. Approximately 1,600 cubic yards of wastes and soil were excavated from Landfill No. 2 between 1994 and 1995, and shipped off site for disposal (Ref. 2). Confirmatory samples from the excavations indicated that remaining pesticide contamination in soil exceeded the NJ RDCSCC. The facility completed remedial actions at this unit by backfilling the excavation and implementing land-use restrictions (i.e. Declaration of Environmental Restriction [DER]) (Refs. 3, 4). The facility currently performs quarterly groundwater monitoring to evaluate natural attenuation of the existing groundwater contamination, and reports the results to NJDEP. NJDEP has rendered a conditional no further action determination for this unit. The no further action determination is based upon the filing of the DER, which was executed for this area in April, 1996, and the continuation of quarterly groundwater monitoring of the wells surrounding this unit. It should also be noted that ACCo is currently preparing documentation to implement a Classification Exemption Area (CEA) to restrict the use of groundwater that may have been impacted by this unit (Ref. 6).

**SWMU 3, Drainage Ditch at Outfall DSN 001:** This unit consists of a drainage ditch that receives discharges from the sanitary and laboratory wastewater treatment systems. This unit is located along the southern part of the property. As part of the discharge permit requirements for the facility and during the RFI process, water, sediment and biota samples were collected from the drainage ditch. One sediment sample (SED-3) contained lead (60 mg/kg), mercury (1.3 mg/kg), copper (71 mg/kg), silver (4.4 mg/kg), and zinc (23 mg/kg) above the applicable sediment standards (i.e., NJDEP Guidance for Sediment Quality Evaluations, Final Draft for Internal Use Only, March 1991). No other sediment, water, or biota samples indicated significant contamination. Also, sample SED-3 was located adjacent to the railroad right-of-way and downstream of samples that did not indicate contamination. A qualitative ecological assessment was performed at this unit as part of the RFI. Based on the results of the ecological assessment, no further action was required for this unit by NJDEP.

**SWMU 4, Drainage Ditch at Outfall DSN 002:** This unit consists of a drainage ditch that receives discharges from storm water and non-contact cooling water. This unit is located at the northwestern part of the site. As part of the discharge permit requirements for the facility and during the RFI process, water, sediment and biota samples were collected from the drainage ditch. Several sediment samples contained elevated metal concentrations above applicable sediment standards (i.e., NJDEP Guidance for Sediment Quality Evaluations, Final Draft for Internal Use Only, March 1991). Two sediment samples (SED-1, SWS-2) contained lead (110 mg/kg, 83 mg/kg), mercury (0.29 mg/kg, 0.32 mg/kg), copper (130 mg/kg in each), and zinc (170 mg/kg, 150 mg/kg). Sediment sample SWS-1 contained mercury at 180 mg/kg. No other sediment, water or biota samples detected contamination above environmental standards. A qualitative ecological assessment was performed at this unit as part of the RFI. Based on the results of the ecological assessment, no further action was required for this unit by NJDEP.

**AOC 1, Formulation Washdown Tank:** This unit consisted of a 1,000 gallon UST with a stainless steel liner. The tank was located at the southeastern corner of the laboratory building. Washdown from the formulation preparation laboratory and scrubber water from the laboratory air pollution control unit were stored in this tank prior to off-site disposal. The steel liner was added to this tank in 1988. The tank was removed in 1991, in conjunction with the RFI (Ref. 1). Removal activities included removal and inspection of the steel liner, excavation of the concrete

vault and surrounding soil, sampling the excavated soil and wipe sampling of the tank liner, and collection of confirmation samples. No VOCs or pesticide constituents were detected in the confirmation soil samples, the excavated soil samples, or the wipe samples at concentrations above New Jersey standards. Thus, no further action was required for this tank by the NJDEP Bureau of Underground Storage Tanks (BUST).

**AOC 2, 10,000-Gallon Diesel UST:** This unit consisted of a 10,000-gallon UST used to store No. 2 fuel oil at the Formulations Building. The tank was removed and closed in 1992 per the requirements of the NJDEP BUST program.

**AOC 3, Stream Adjacent to Outfall DSN 001:** This AOC received discharges from the sanitary and laboratory wastewater treatment processes from SWMU 3 and the drainage ditch at Outfall DSN 001 (SWMU 3). The stream flows west along the southern boundary of the site, crossing the property line near the southwestern corner of the ACCo site. The site characterization activities and sample results for this AOC are described with SWMU 3. NJDEP has determined that no further action is required at this AOC.

**AOC 4, Stream Adjacent to Outfall DSN 002:** This AOC received discharges of storm sewers and non-contact cooling water from SWMU 4 and the Drainage Ditch at Outfall DSN 002 (SWMU 4). The stream flows east and northeast across the northern portion of the site, discharging to Duck Pond Run northeast of the ACCo site. The stream receives drainage from the Irrigation Pond and the Fire Pump Pond at the site. The site characterization and sample results for this AOC are described with SWMU 4. NJDEP has determined that no further action is required at this AOC.

**AOC 5, Reactive Chemical Detonation Area:** This area is located in the northwestern part of the site, southeast of Landfill No. 1. This area was an open field used for disposal of pyrophoric laboratory chemicals by detonation. During the RFI, five soil samples were collected and analyzed for VOCs (Ref. 1). No contaminants were detected in soil at this AOC, thus no further action was required by NJDEP.

**AOCs 6 through 16, Petroleum USTs:** Eleven USTs were present at the facility and used for the storage of petroleum products. Seven of the tanks contained No. 2 fuel oil, three tanks contained gasoline, and one tank contained No. 6 fuel oil. All of the storage tanks were removed and closed under the NJDEP BUST program. The tanks are summarized in Table 1 below.

**Table 1 - AOCs 6 through 16, Petroleum USTs**

<b>Tank No.</b>	<b>Location</b>	<b>Capacity (gallons)</b>	<b>Contents</b>	<b>Status</b>
E1	Research and Development	25,000	No. 2 Fuel Oil	Removed 1992
E3	T-6	500	No. 2 Fuel Oil	Removed 6/90
E4	Clinical Building	10,000	No. 2 Fuel Oil	Removed 1992
E5	Greenhouses	15,000	No. 2 Fuel Oil	Removed 1992
E6	Cafeteria	10,000	No. 2 Fuel Oil	Removed 6/90
E7	Poultry House	10,000	No. 2 Fuel Oil	Removed 6/90
E8	Farrowing House	1,000	No. 2 Fuel Oil	Removed 6/90
001	T-8	1,000	Regular Gasoline	Removed 6/90
002	Agronomy	1,000	Unleaded Gasoline	Removed 1992
003	Agronomy	1,000	Regular Gasoline	Removed 1992
C2	Research and Development	25,000	No. 6 Fuel Oil	Closed 1987

In summary, all SWMUs and AOCs require no further action or investigation with the exception of Landfill No. 2 (SWMU 2). Landfill No. 2 (SWMU 2) received a conditional no further action determination for soil on April 28, 1997. The conditional determination was contingent on the implementation of the DER, which was executed on October 2, 1996, and required that quarterly groundwater monitoring continue. According to the NJDEP, ACCo is also currently preparing documentation to implement a CEA which will restrict the use of groundwater in the area contamination associated with Landfill No. 2 (SWMU 2) (Ref. 6).

**References:**

1. RCRA Facility Investigation, American Cyanamid Company Agricultural Research Center, West Windsor, New Jersey. Prepared by Harding Lawson Associates. Dated June, 1992.
2. Remedial Action Report, American Cyanamid Company Agricultural Research Center. Prepared by Harding Lawson Associates. Dated September, 1995.
3. **Letter from Pamela Baker, American Cyanamid Company, to Robert Marcolina, NJDEP, Re: Declaration of Environmental Restriction. Dated October 11, 1996.**
4. Letter from Roman S. Luzecky, NJDEP, to Pamela Baker, American Cyanamid Company, Re: No Further Action for Soils, American Home Products Company. Dated April 28, 1997.
5. Fax from Jeannette Cleary, Bureau of Field Operations, NJDEP, to Agathe Nadai, USEPA, Re: Summary of Former Underground Storage Tanks. Dated February 1, 2001.

6. Telephone communication between Agathe Nadai, USEPA, and Robert Marcolina, NJDEP. February, 2001.
2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “**contaminated**”<sup>1</sup> above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			VOCs, pesticides
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)	X			4,4-DDT, toxaphene
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			4,4-DDT, toxaphene
Air (Outdoor)		X		

\_\_\_\_\_ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter IN status code.

**Rationale:**

**Groundwater**

Groundwater beneath the ACCo site occurs at approximately 15 feet below ground surface (bgs) across the southern portion of the site, and approximately 6 feet bgs across the northern portion of the site. The uppermost aquifer beneath the site is an unconsolidated overburden aquifer (Ref. 1). Initial investigations

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<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

determined that the unconsolidated aquifer is unconfined, and that groundwater in this aquifer flows to the north beneath the site. At a depth of approximately 36 to 50 feet, the unconsolidated aquifer is underlain by bedrock. The bedrock beneath the site is comprised of sandstone in the northeastern part of the site, and metamorphic rock to the southwest.

Groundwater investigations at this site initially detected contaminant concentrations above the NJ GWQC in July, 1988, in the area of Landfill No. 2 (SWMU 2). Historical groundwater contamination at this unit has primarily consisted of VOC and pesticide contamination in the unconsolidated aquifer. The facility monitors a series of five well locations (MW-5, MW-6, MW-7, MW-8, and MW-12) to assess groundwater contamination in the area of Landfill No. 2 (SWMU 2). MW-5 and MW-6 are located immediately downgradient of Landfill No. 2 (SWMU 2), while MW-7 and MW-8 are located immediately upgradient. MW-12 is located on site approximately 1,800 feet downgradient of Landfill No. 2 (SWMU 2). Contamination has not been detected above NJ GWQC in MW-12. Currently, only a few constituents are being detected above NJ GWQC in MW-5 and MW-6. Table 2 identifies all constituents detected in the vicinity of Landfill No. 2 (SWMU 2) above NJ GWQC during the last two documented groundwater monitoring events (Ref. 5).

**Table 2 - Constituents Detected in Groundwater Above NJ GWQC During Recent Groundwater Monitoring Events (µg/l)**

MW	Constituent	NJ GWQC	6/00	9/00
MW-5	Chloroform	6.0	15.6	10.6
	Carbon Tetrachloride	2	BS	BS
	Alpha-BHC	0.02	0.26	0.02
	Gamma-BHC	0.2	1.41	BS
MW-6	Gamma-BHC	0.2	0.20	BS
MW-7	Alpha-BHC	0.02	0.18	BS
	Gamma-BHC	0.2	8.36	1.29
MW-8	Gamma-BHC	0.2	0.36	0.24

BS - constituent was detected below the NJ GWQC

**Air (Indoors)**

Chloroform and carbon tetrachloride are the only volatile constituents that are currently present in groundwater at Landfill No. 2 (SWMU 2) above the NJ GWQC. However, these two constituents are both well below the Connecticut Volatilization Criteria for Residential Exposure (i.e., carbon tetrachloride = 16 µg/l, chloroform = 287 µg/l), and thus are unlikely to migrate into indoor air at levels of concern. In addition, the groundwater contamination has only been detected in the vicinity Landfill No. 2 (SWMU 2) which is in an undeveloped portion of the site. There are currently no buildings located above the area of groundwater contamination. Thus, due the low levels of VOCs detected on site and the lack of on-site

buildings in the area of groundwater contamination, contamination migration into indoor air is not a concern at ACCo.

### **Surface/Subsurface Soil**

According to the RAR, all soil impacted above the New Jersey Impact to Groundwater Screening Criteria has been removed from Landfill No. 2 (SWMU 2). However, pesticides remained in soil above both the NJ RDCSCC and NJ NRDCSCC after remedial efforts at Landfill No. 2 (SWMU 2) were completed. According to the DER, 4,4-DDT (2.26 mg/kg, 6.84 mg/kg) is present at two boring locations within the footprint of Landfill No. 2 (SWMU 2) above the NJ RDCSCC (2.0 mg/kg), but below the NJ NRDCSCC (9.0 mg/kg). Toxaphene (3.57 mg/kg, 8.16 mg/kg) has also been detected at two boring locations within the footprint of Landfill No. 2 (SWMU 2) above both NJ RDCSCC ( 0.10 mg/kg) and NJ NRDCSCC (0.20 mg/kg). According to the DER, these contaminant concentrations are present at the base of excavated areas (5 to 13 feet bgs) (Ref. 3). In addition, the toxaphene method detection limit was elevated (i.e., 0.22 mg/kg) above the soil standards in numerous sampling locations at Landfill No. 2 (SWMU 2).

### **Surface Water/Sediment**

Surface water and sediment at the ACCo site consists of two small on-site ponds, small streams in the southeastern and northern portion of the property, and surface drainage ditches. Historical groundwater monitoring has documented that groundwater contamination is stabilized in the area of Landfill No. 2 (SWMU 2) and not migrating into on- or off-site surface water.

### **Air (Outdoors)**

Based upon the nature and limited extent of contamination in soil and groundwater in Landfill No. 2 (SWMU 2), volatile emissions and/or the migration of particulates entrained on dust are not expected to be significant exposure pathways of concern at the ACCo facility.

### **References:**

1. **RCRA Facility Investigation, American Cyanamid Company Agricultural Research Center, West Windsor, New Jersey. Prepared by Harding Lawson Associates. Dated June, 1992.**
2. **Remedial Action Report, American Cyanamid Company Agricultural Research Center. Prepared by Harding Lawson Associates. Dated September, 1995.**
3. **Letter from Pamela Baker, American Cyanamid Company, to Robert Marcolina, NJDEP, Re: Declaration of Environmental Restriction. Dated October 11, 1996.**
4. **Letter from Roman S. Luzecky, NJDEP, to Pamela Baker, Facility Environmental Engineer, Re: No Further Action for Soils, American Home Products Company. Dated April 28, 1997.**
5. **Letter from Robert J. Guidry, P.G., to Robert Marcolina, NJDEP, Re: Quarterly Groundwater Monitoring Well Report Submittal. Dated October 24, 2000.**

3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table  
*Potential **Human Receptors** (Under Current Conditions)*

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food <sup>3</sup>
Groundwater	No	No	No	No	–	–	No
Air (indoor)							
Surface Soil (e.g. < 2 ft)	No	No	No	No	No	No	No
Surface Water							
Sediment							
Subsurface Soil (e.g., > 2 ft)	–	–	–	No	–	–	No
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated”Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes (“--”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

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<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

**Rationale:**

**Groundwater**

VOC and pesticide contamination is present in groundwater at Landfill No. 2 (SWMU 2). This contamination is limited in extent to the Landfill No. 2 (SWMU 2) area, as shown by the presence of contamination in MW-5, MW-6, MW-7, and MW-8, and by the absence of contamination in downgradient MW-12. In general, quarterly and semi-annual monitoring at the facility has shown a general decreasing trend for contaminants of concern (COC) in the Landfill No. 2 (SWMU 2) area over time. However, it should be noted that MW-7 and MW-8, which are upgradient of Landfill No. 2 (SWMU 2) have shown an average higher concentration of pesticides (alpha-BHC and gamma-BHC) than downgradient MW-5 and MW-6. The RFI report identified pesticide application on adjacent agricultural lands east and southeast of the facility as a potential source of the pesticide concentrations detected in groundwater at Landfill No. 2 (Ref. 1). In addition, quarterly groundwater monitoring results have shown that concentrations of alpha-BHC and gamma-BHC have been fluctuating in MW-7 and MW-8 since 1989. Because the contaminated soil in Landfill No. 2 (SWMU 2) has been removed, these monitoring results indicate a potential off-site source for pesticide contamination in groundwater. Furthermore, because pesticide contamination has not been detected in downgradient MW-12 at levels above NJ GWQC, the contamination appears to be naturally attenuating in the area of Landfill No. 2 (SWMU 2) and not reaching downgradient and off-site locations. The remaining constituents (chloroform, carbon tetrachloride) detected in groundwater have shown a historical downward trend in MW-5 and MW-6 and have also not been detected in downgradient MW-12. Thus, all groundwater contamination associated with Landfill No. 2 (SWMU 2) is currently present within site boundaries, concentrated in the Landfill No. 2 (SWMU 2) area, and expected to naturally attenuate to levels below the NJ GWQC over time.

Municipal water supplies for West Windsor are supplied by Elizabethtown Water Company, which obtains water from wells located in Jefferson Park, West Windsor, over one mile northeast of the site. These municipal wells are all located downgradient of on-site MW-12, which has an absence of contamination. A well records search was performed as part of the RFI process. Based upon search results 58, well records describing a total of 66 wells were identified within a 0.5 mile radius of the site. Of these wells, 11 were monitoring wells (i.e., non-supply wells); 6 were for non-drinking supplies (i.e., fire protection, industrial process, etc.); 1 was for irrigation supply; 45 were used as potable water supplies; and 3 were of unknown usage. According to the RFI, the facility also maintains four active production wells (Wells D, E, I, and K) which provide production water supplies for the facility. Water samples were collected at these production wells during the RFI process and none of the samples indicated the presence of any target analytes above action levels.

It should also be noted that ACCo is currently in the process of preparing documentation to implement a CEA for groundwater for the Landfill No. 2 (SWMU 2) area. The CEA will document the nature and extent of the contamination at Landfill No. 2 (SWMU 2) for public record and restrict future use of groundwater that has been impacted by waste management activities at Landfill No. 2 (SWMU 2).

Thus, based upon all available documentation, there is currently no complete exposure pathways to contaminated groundwater in the Landfill No. 2 (SWMU 2) area, given that the contamination is concentrated on site in the Landfill No. 2 (SWMU 2) area and not reaching MW-12 or off-site locations. In addition, groundwater monitoring results have indicated that contaminant concentrations are naturally

attenuating over time and not reaching MW-12, which is approximately 1,800 feet downgradient of Landfill No. 2 (SWMU 2).

### **Surface/Subsurface Soil**

According to the RAR and the DER, pesticides are still present in soil at Landfill No. 2 (SWMU 2) above the NJ RDCSCC and NJ NRDCSCC. The DER indicates that the elevated levels are present at the base of the excavated areas in Landfill No. 2 (SWMU 2), at an approximate depth of 5 to 13 feet bgs.

The property is currently used for industrial purposes and only toxaphene has been detected in Landfill No. 2 (SWMU 2) above the NJ NRDCSCC. However, because the soil contamination is present only in the subsurface, direct exposure for on-site workers and/or trespassers is not considered a complete exposure pathway.

In addition, the implementation of the DER restricts current and future uses, disruptions, and alterations in contaminated soil areas at Landfill No. 2 (SWMU 2). This DER eliminates the potential for on-site construction workers to contact contaminated subsurface soil in Landfill No. 2 (SWMU 2) that is above the NJ NRDCSCC. Thus, there are currently no complete exposure pathways to contaminated soil at the ACCo site.

### **References:**

1. **RCRA Facility Investigation, American Cyanamid Company Agricultural Research Center, West Windsor, New Jersey. Prepared by Harding Lawson Associates. Dated June, 1992.**
2. **Remedial Action Report, American Cyanamid Company Agricultural Research Center. Prepared by Harding Lawson Associates. Dated September, 1995.**
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4. **Letter from Roman S. Luzecky, NJDEP, to Pamela Baker, Facility Environmental Engineer, Re: No Further Action for Soils, American Home Products Company. Dated April 28, 1997.**
5. **Letter from Robert J. Guidry, P.G., to Robert Mercolina, NJDEP, Re: Quarterly Groundwater Monitoring Well Report Submittal. Dated October 24, 2000.**

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks?

\_\_\_\_\_ If no (exposures cannot be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

**Rationale:**

This question is not applicable. See response to question #3.

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<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the “significant” **exposures** (identified in #4) be shown to be within acceptable limits?

\_\_\_\_\_ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

\_\_\_\_\_ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

\_\_\_\_\_ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

**Rationale:**

This question is not applicable. See response to question #3.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the American Cyanamid Facility, EPA ID# NJD002349009, located at the intersection of Quakerbridge and Clarksville Roads, in West Windsor, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

**Completed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Kristin McKenney  
Risk Assessor  
Booz Allen & Hamilton

**Reviewed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Kathy Rogovin  
Senior Risk Assessor  
Booz Allen & Hamilton

**Also Reviewed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Agathe Nadai, RPM  
RCRA Programs Branch  
EPA Region 2

\_\_\_\_\_  
Barry Tornick, Section Chief  
RCRA Programs Branch  
EPA Region 2

**Approved by:** Original signed by: \_\_\_\_\_ **Date:** March 29, 2001

Raymond Basso, Chief  
RCRA Programs Branch  
EPA Region 2

**Locations where references may be found:**

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15<sup>th</sup> Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6<sup>th</sup> Floor, Trenton, New Jersey.

**Contact telephone and e-mail numbers:** Agathe Nadai, EPA RPM  
(212) 637-4174  
[nadai.agathe@epa.gov](mailto:nadai.agathe@epa.gov)

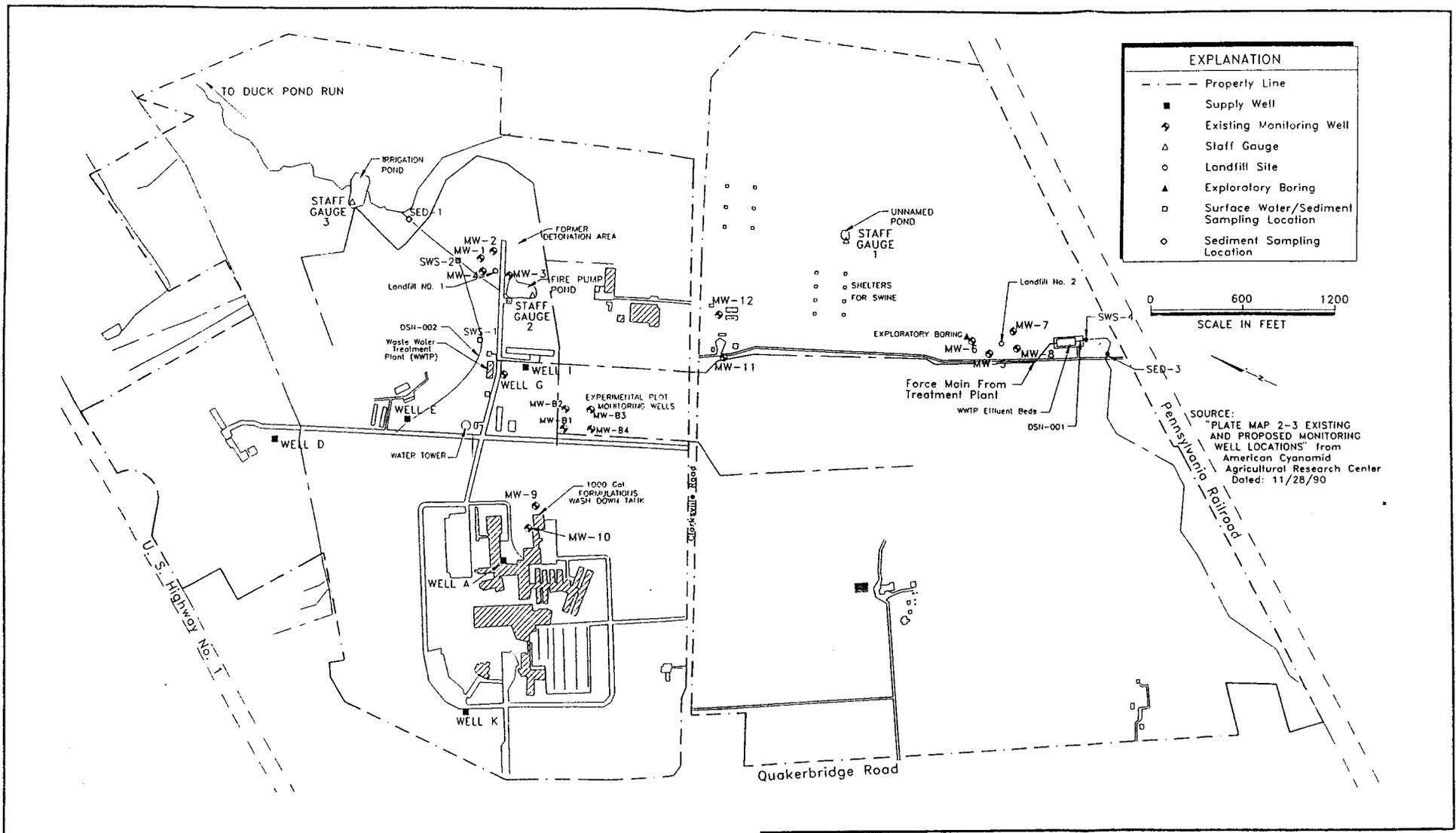
**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

### **Attachments**

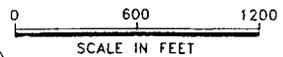
The following attachments have been provided to support this EI determination.

- ▶ Attachment 1 - SWMU and AOC Map
- ▶ Attachment 2 - Summary of Media Impacts Table

**Attachment 1 - SWMU/AOC Map**  
 Source: RCRA Facility Investigation, 1992



EXPLANATION	
- - - - -	Property Line
■	Supply Well
⊕	Existing Monitoring Well
△	Staff Gauge
○	Landfill Site
▲	Exploratory Boring
□	Surface Water/Sediment Sampling Location
○	Sediment Sampling Location



SOURCE:  
 "PLATE MAP 2-3 EXISTING  
 AND PROPOSED MONITORING  
 WELL LOCATIONS" from  
 American Cyanamid  
 Agricultural Research Center  
 Dated: 11/28/90

	<b>Harding Lawson Associates</b> Engineering and Environmental Services	<b>SITE PLAN</b> RCRA FACILITY INVESTIGATION AGRICULTURAL RESEARCH CENTER, West Windsor, NJ	PLATE <b>2</b>
	DRAWN WGA	JOB NUMBER 11956.002	APPROVED 
			REVISED DATE 6/92

**Attachment 2 - Summary of Media Impacts Table**

**American Cyanamid (West Windsor)**

	<b>GW</b>	<b>AIR (Indoors)</b>	<b>SURF SOIL</b>	<b>SURF WATER</b>	<b>SED</b>	<b>SUB SURF SOIL</b>	<b>AIR (Outdoors)</b>	<b>CORRECTIVE ACTION MEASURE</b>	<b>KEY CONTAMINANTS</b>
SWMU 1. Landfill No. 1	No	No	Yes	No	No	Yes	No	▸ Soil Excavation, NFA	Metals
SWMU 2. Landfill No. 2	Yes	No	Yes	No	No	Yes	No	▸ Soil Excavation and Backfill ▸ DER (Conditional NFA for soil) ▸ Natural Attenuation and Groundwater Monitoring	VOCs, Pesticides
SWMU 3. Drainage Ditch at Outfall DSN 001	No	No	Yes	No	Yes	No	No	▸ Ecological Assessment, NFA	Metals
SWMU 4. Drainage Ditch at Outfall DSN 002	No	No	Yes	No	Yes	No	No	▸ Ecological Assessment, NFA	Metals
AOC 1. Formulations Washdown Tank	No	No	No	No	No	No	No	▸ Tank Removal, NFA	NA
AOC 2. 10,000-Gallon Diesel UST	No	No	No	No	No	No	No	▸ Tank Removal, NFA	NA
AOC 3. Stream Adjacent to Outfall DSN 001	No	No	Yes	No	Yes	No	No	▸ Ecological Assessment, NFA	Metals
AOC 4. Stream Adjacent to Outfall DSN 002	No	No	Yes	No	Yes	No	No	▸ Ecological Assessment, NFA	Metals
AOC 5. Reactive Chemical Detonation Area	No	No	No	No	No	No	No	▸ NFA	NA
AOCs 6-16. USTs	No	No	No	No	No	No	No	▸ Tank Closure and Removal under NJDEP BUST Program	NA

**NFA - No Further Action**

**NA - Not applicable**