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June 17, 1997

Via Overnight Mail

Mary McAuliffe, Esq.
Associate Regional Counsel
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Ms. McAuliffe:

I enclose two (2) copies of the RCRA Corrective Action Order for the DuPont East Chicago Plant signed by DuPont June 17, 1997.

We appreciate the professionalism of the Region 5 staff in our negotiation of this Order.

Very truly yours,

A handwritten signature in cursive script that reads "Bernard J. Reilly".

Bernard J. Reilly

BJR:cd
Enclosures

CC: Dr. W. J. Lawrence, DuPont
Patricia M. Winkley, DuPont East Chicago

RCRA CORRECTIVE ACTION ORDER

**DUPONT COMPANY
5215 KENNEDY AVENUE
EAST CHICAGO, INDIANA**

IND 005 174 354

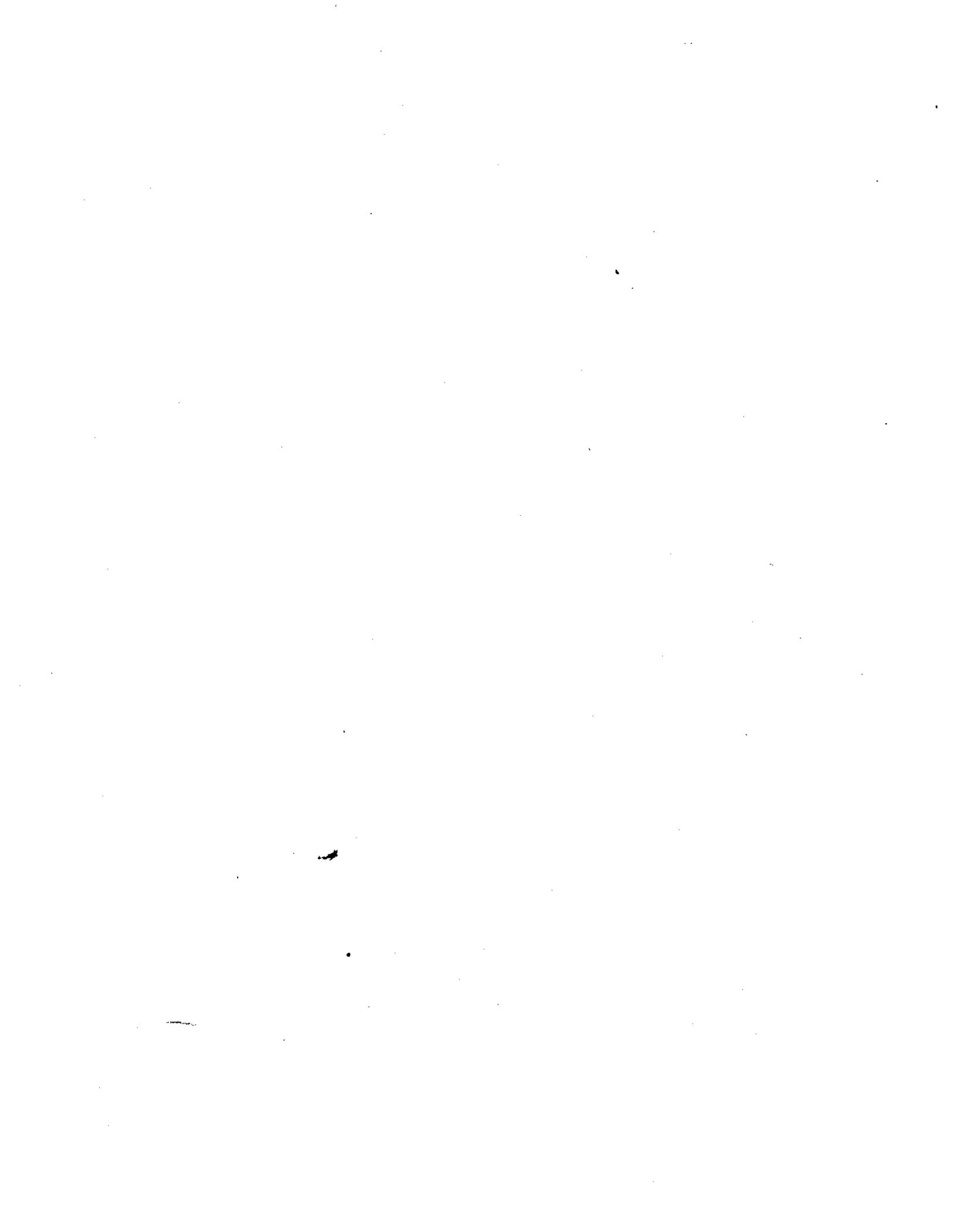


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APPENDICES

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- ATTACHMENT IV - MODEL QUALITY ASSURANCE PROJECT PLAN
- ATTACHMENT V - GUIDANCE DOCUMENTS
- ATTACHMENT VI - MAP OF WMUs AT FACILITY

3. Respondent consents to and agrees not to contest U.S. EPA's jurisdiction to issue this Order pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h) and to enforce its terms. Furthermore, Respondent will not contest U.S. EPA's jurisdiction to: compel compliance with this Order in any subsequent enforcement proceedings, either administrative or judicial; require Respondent's full or interim compliance with the terms of this Order; or impose sanctions for violations of this Order. Respondent's consent and agreement to the terms of this Order shall not be construed in any way as an admission of liability for any violations of applicable Federal, State, and local environmental regulatory, and statutory requirements, and neither an admission nor denial of the findings of fact.

II. DEFINITIONS

Unless otherwise expressly provided herein, terms used in this Order which are defined in RCRA or in regulations promulgated under RCRA shall have the definitions given to them in RCRA or in such regulations.

1. Acceptable, in the phrase "In a manner acceptable to U.S. EPA..." shall mean that submittals or completed work meet the terms and conditions of this Order, attachments, scopes of work, approved work plans and/or U.S. EPA's written comments and guidance documents.
2. Additional work shall mean any activity or requirement that is not expressly covered by this Order or its attachments

but is determined by U.S. EPA to be necessary to fulfill the purpose of this Order as presented in Section III:

Statement of Purpose. Additional work, if any, will be incorporated into and made an enforceable part of this Order.

3. Administrative Record shall mean the record compiled and maintained by U.S. EPA supporting this Order. For information on the contents of the Administrative Record see "Guidance on Administrative Records for RCRA § 3008(h) Actions," OSWER Directive 9940.4, July 6, 1989.
4. Area of Concern shall mean any area of the Facility under the control or ownership of the owner or operator where a release to the environment of hazardous waste(s) or hazardous constituents has occurred, is suspected to have occurred, or may occur, regardless of the frequency or duration of the release.
5. CERCLA shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, et seq.
6. Comply or compliance may be used interchangeably and shall mean completion of work required by this Order of a quality approvable by U.S. EPA and in the manner and time specified in this Order or any modification thereof, its attachments or any modification thereof, or written U.S. EPA directives. Respondent must meet both the quality and timeliness

components of a particular requirement to be considered in compliance with the terms and conditions of this Order.

7. Contractor shall include any individual, corporation, partnership, organization or other legal entity (affiliate) that directly or indirectly is awarded a contract to conduct or monitor any portion of the work performed pursuant to this Order, or is a subcontractor, consultant, or laboratory that conducts business as an agent or representative of the contractor.
8. Corrective Measures shall mean those measures or actions necessary to control, prevent, or mitigate the release or potential release of hazardous waste or hazardous constituents from the Facility into the environment.
9. Corrective Measures Study or CMS shall mean the investigation and evaluation of potential remedies which will protect human health and/or the environment from the release or potential release of hazardous wastes, or hazardous constituents, into the environment at or from the Facility. The CMS requirements are detailed in the CMS Scope of Work included as Attachment III.
10. Data Quality Objectives shall mean the qualitative or quantitative statements, the application of which is designed to ensure that data of known and appropriate quality are obtained.
11. Day shall mean a calendar day unless expressly stated to be a business day. Business day shall mean a day other than a

Saturday, Sunday, or Federal holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the end of the next business day.

12. Facility shall mean all contiguous property under the control of the owner and/or operator.
13. Hazardous Constituents shall mean those constituents listed in Appendix VIII to 40 C.F.R. Part 261 or any constituent identified in Appendix IX to 40 C.F.R. Part 264.
14. Hazardous Waste shall mean hazardous waste as defined in Section 1004(5) of RCRA or 40 C.F.R. § 260.10. This term includes hazardous constituents as defined above.
15. IDEM shall mean the Indiana Department of Environmental Management and any successor Agencies or Departments of the State of Indiana.
16. Innovative Treatment Technologies shall mean those technologies for treatment of soil, sediment, sludge, and debris other than incineration or solidification/stabilization and those technologies for treatment of groundwater contamination that are alternatives to pump and treat. Pump and treat in this instance refers to pumping ground water and subsequently treating it with conventional treatments like air stripping and UV oxidation.
17. Interim Measure(s) or IM shall mean those actions which can be initiated in advance of implementation of the final corrective action for a facility, to achieve the goal of

stabilization. Interim Measure(s) initiates cleanup at a facility and controls or eliminates the release or potential release of hazardous wastes or hazardous constituents at or from the Facility. The IM requirements are detailed in the IM Scope of Work included as Attachment II, Appendix A.

18. Receptors shall mean those humans, animals, or plants and their habitats which are or may be affected by releases of hazardous waste or hazardous constituents at or from the Facility.
19. RCRA Facility Investigation or RFI shall mean the investigation and characterization of the source(s) of contamination and the nature, extent, direction, rate, movement, and concentration of the source(s) of contamination and releases of hazardous waste, including hazardous constituents, that have been or are likely to be released into the environment at or from the Facility. The activities required for the RFI are detailed in the RFI Scope of Work included as Attachment II.
20. Solid Waste Management Unit or SWMU shall mean any discernible unit at which solid wastes have been placed at any time irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility where solid wastes have been routinely, systematically, or inadvertently released.
21. Scope of Work or SOW shall mean the outline of work Respondent must use to develop all work plans and reports

required by this Order as set forth in this Order and its Attachments I through IV. All SOW Attachments and modifications or amendments thereto are incorporated into this Order and are an enforceable part of this Order.

22. Stabilization shall mean the control or abatement of immediate threats to human health and/or the environment from releases and/or preventing or minimizing the spread of contaminants at or from the Facility while long-term corrective measures alternatives are being evaluated.
23. Submittal shall include any work plan, report, diagram, progress report, or any other written document Respondent is required by this Order to send to U.S. EPA.
24. U.S. EPA shall mean the United States Environmental Protection Agency, and any successor Departments or Agencies of the United States.
25. Violations of this Order shall mean those actions or omissions, failures or refusals to act by Respondent that result in a failure to meet the terms and conditions of this Order or its attachments.
26. Waste Management Unit or WMU shall have the same meaning as the term is used in the Phase I Report prepared by DuPont's contractor CH2M Hill.
27. Work or Obligation shall mean any activity Respondent must perform to comply with the requirements of this Order and its attachments.

28. Work plan shall mean the detailed plans prepared by the Respondent to satisfy the requirements of the corresponding Scope of Work. The requirements for the work plan are presented in Section VIII: Work to be Performed and the Attachments.

III. STATEMENT OF PURPOSE

In entering into this Order, the mutual objectives of the parties are: (1) to perform a sediment investigation in the Grand Calumet River and adjacent wetlands (identified in Figure 1 of Attachment I) to determine the nature and extent of any release of hazardous wastes and hazardous constituents from the Facility as an Interim Measure (IM); (2) to perform a RCRA Facility Investigation (RFI) to determine the nature and extent of any release of hazardous wastes and/or hazardous constituents at or from the Facility; (3) to perform a Corrective Measures Study (CMS) to identify and evaluate alternatives for the corrective action necessary to prevent or mitigate migration or releases of hazardous wastes and/or hazardous constituents at or from the Facility; and (4) to perform any other activities necessary to abate or evaluate actual or potential threats to human health and/or the environment resulting from the release or potential release of hazardous waste or hazardous constituents at or from the Facility.

IV. PARTIES BOUND

1. This Order shall apply to and be binding upon Respondent and its officers, directors, employees, agents, and successors

and assignees, and upon all persons, independent contractors, contractors, and consultants acting on behalf of Respondent.

2. No change in ownership or corporate or partnership status relating to the Facility will in any way alter Respondent's responsibility under this Order. Any conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, shall not affect Respondent's obligations under this Order. Respondent will be responsible for and liable for any failure to carry out all activities required of Respondent by the terms and conditions of the Order, regardless of Respondent's use of employees, agents, contractors, or consultants to perform any such tasks.
3. Respondent shall provide a copy of this Order to all contractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within fourteen (14) days of the issuance of this Order or the retention of such person(s), whichever occurs later, and shall condition all such contracts on compliance with the terms of this Order.
4. Respondent shall give written notice of this Order to any successor in interest prior to transfer of ownership or operation of the Facility or a portion thereof and shall notify U.S. EPA in writing within thirty (30) days prior to such transfer.

5. Respondent agrees to undertake all actions required by the terms and conditions of this order, including any portions of this order incorporated by reference. Respondent waives any rights to request a hearing on this matter pursuant to § 3008(b) of RCRA and 40 C.F.R. Part 24, and consents to the issuance of this order without a hearing pursuant to § 3008(b) of RCRA as a consent order issued pursuant to § 3008(h) of RCRA.

V. FINDINGS OF FACT

GENERAL

1. Respondent is a person doing business in the State of Indiana.
2. Respondent's Facility is located at 5215 Kennedy Avenue, East Chicago, Indiana.
3. Pursuant to § 3010 of RCRA, Respondent notified U.S. EPA of its hazardous waste activity. In its notification dated August 12, 1980, the Respondent identified itself as a generator of solvents (F001 and F005), ignitable waste (D001), and corrosive waste (D002); and an owner/operator of a treatment, storage, and/or disposal facility for hazardous waste.
4. On November 3, 1980, Respondent submitted a hazardous waste permit application. In this application, Respondent identified itself as generating and storing the following hazardous wastes at the Facility:
 - a. Hazardous wastes exhibiting the characteristics of ignitability (D001) and corrosivity (D002); and

- b. Hazardous wastes from non-specific sources (F001 and F005).
5. On March 17, 1982, Respondent requested that its RCRA status be changed from both a generator and a storage facility to solely a generator, and that U.S. EPA withdraw its application for a storage permit.
 6. The Facility continued to store and dispose of hazardous wastes on-site after that time.
 7. Wastes from the agricultural chemical (AgChem) processes were stored in drums in one of 4 areas referred to as Waste Management Unit (WMU) 4 from 1980 - 1984. After 1984, until AgChem production ceased in 1986, these wastes were stored in rail cars at the Facility. See Attachment VI for a map of all WMUs at the Facility, as identified by Respondent.
 8. Wastes from spent solvents (F005) including toluene, were stored in a separate area of WMU 4, prior to shipment off-site for disposal.
 9. Documents submitted to U.S. EPA or IDEM by Respondent indicate that the Facility regularly or periodically generated other hazardous wastes as part of its normal operations which were not reported on the hazardous waste notification or the Part A application. These wastes included hazardous flue dust and refractory brick waste (D007) from silicate furnace demolition and rebuilds.
 10. Both silica furnace flue dust (D007) and refractory brick waste (D007) were stored at the Facility in excess of ninety days during 1991 through 1993. Silica furnace flue dust was

stored in drums, and refractory brick was initially stored in a waste pile and then placed into drums until manifested off-site in 1993.

11. The Facility reportedly land disposed a number of solid or hazardous wastes on site between 1893 to 1985, in WMU 2. Hazardous waste land filled there included silica furnace flue dust and bricks (D007).
12. In 1991, DuPont switched to a new, non-chromium refractory brick. Waste characterization subsequently completed in 1994 on flue sweepings (dust) indicates it did not exceed the regulatory threshold for chromium. To U.S. EPA's knowledge and belief, there has been no generation or waste characterization of refractory brick at the Facility since 1993.

FACILITY AND PROCESS DESCRIPTION

13. The Facility is located in Lake County, Indiana, and was historically one of the major chemical manufacturing plants in the United States. It is situated on the southeast side of the City of East Chicago, located approximately 30 miles southeast of downtown Chicago. The southern portion of the Facility borders the Grand Calumet River.
14. Plant operations began in 1892, under the ownership of Grasselli Chemical Company. DuPont has operated the plant since 1927, and was deeded the property consisting of approximately 470 acres on October 31, 1936. Currently, the East Chicago Facility is operating at a capacity much

reduced from its peak historic production, once producing more than 100 products and employing 2,000 people.

15. Since about 1980, the East Chicago Facility has undergone reduction in production activities and employees. A list of DuPont production lines which have ceased operations since 1980 is presented as Table 1. This list is an approximation based on information collected in the file reviews and responses to U.S. EPA information requests. Although not a complete list, it illustrates the magnitude of the reduction in manufacturing processes at the East Chicago Facility in recent years.
16. The Facility is currently engaged in the manufacture of inorganic chemicals, including sodium silicate and colloidal silica ("Ludox"). In 1990, the plant employed 52 workers manufacturing these two product lines. The manufacturing is limited to approximately 28 acres in the southwest corner of the site.

TABLE 1

DUPONT PRODUCTION LINES CLOSED SINCE 1980

PRODUCT LINE	YEAR DISCONTINUED
Sulfuric Acid Products	1984
Nitric Acid Reagent	1984
Hydrochloric Acid Reagent	1982
Acetic Acid Reagent	1982
Daclean Inhibited Acid Products	1984
Ammonium Hydroxide Reagent	1984
Sulfamic Acid	1984
Fluorosulfonic Acid	1988

WASTE DESCRIPTIONS

17. The wastes historically generated at the Facility were hazardous wastes, nonhazardous solid wastes, reclaimed/recycled materials, and waste waters.

Hazardous Wastes

18. Hazardous wastes historically generated at the Facility were listed in the RCRA Part A permit application. Subsequently, most hazardous wastes are no longer generated due to process areas being shut down or changes in production processes. The hazardous wastes currently generated at the Facility, some of which may not be hazardous depending on shipping, include: waste solvents; fluorescent lights; batteries; mercury, and other lab wastes.

Nonhazardous Solid Wastes

19. Solid wastes currently generated at DuPont include general industrial debris and rubbish (e.g., paper, wood, tires, empty containers, construction/demolition debris, and scrap metal); gas-cleaning and wastewater treatment sludges, and used/spent industrial chemicals (e.g., cleaners, etc). Some of these wastes are industrial wastes which may contain hazardous constituents, but are not RCRA hazardous wastes. Some of the nonhazardous wastes are currently placed in areas within the Facility. These areas include WMU 14, for environmental control filter cakes generated from the Ludox process. The above-referenced wastes, with the exception of general refuse, are defined as "special wastes" in the State of Indiana, pursuant to 329 IAC 10-8. Special wastes include all industrial process wastes and wastes generated by operation of air, water and waste pollution control devices which are not regulated by the RCRA Subtitle C hazardous waste program. Non-hazardous wastes currently generated at the Facility are Type IV restricted wastes as defined by IDEM at 329 IAC 10-9-2.

Reclaimed/Recycled Materials

20. The Facility reclaims acids from production, and stores the material on-site in above ground storage tanks. The acid is consumed in the environmental control facility.

Wastewater Treatment Facilities

21. The Facility has historically discharged waste waters to the Grand Calumet River from as many as 13 outfalls. Since 1971, this has been reduced, to one outfall at present. Table 2 identifies many of the outfalls historically used, and the production processes associated with these outfalls. This information was developed from DuPont's November 22, 1991 response to the CERCLA § 104(e) request for information, and other information in U.S. EPA's files.
22. On November 14, 1972, a consent decree between Respondent and the U.S. government was signed, which resolved a water pollution action. The consent decree required DuPont to construct water pollution control facilities, and consolidate its outfalls, among other items. As a result of work required and completed pursuant to the decree, DuPont reduced its outfalls to 3 -- one non-contact cooling water (001) and two process outfalls (002 and 003). (Ref. DuPont April 29, 1980 response to U.S. EPA information request.) The outfall designations associated with this consolidation and the subsequent National Pollutant Discharge Elimination System (NPDES) permits issued do not correspond to the previous historical outfall designations, which are indicated in Table 2.
23. The Facility was issued NPDES Permit No. IN0000329 to discharge to the East Branch of the Grand Calumet River, by U.S. EPA on October 31, 1974. That permit was adjudicated

- by Respondent, and was superseded by a subsequent permit issued by U.S. EPA on March 24, 1976. That permit authorized the discharge by DuPont from Outfalls 001, 002 and 003. Interim limitations were effective from issuance until December 31, 1976, and final limitations were effective after that date, until expiration on December 31, 1978. The permit authorized the discharge of treated waste waters containing oil and grease (Outfall 001), zinc, phosphorus, suspended solids, chlorides, sulphates and total dissolved solids up to the limitations specified therein. Ammonia discharges were subsequently authorized and limited, effective August 27, 1976. The permit was reissued April 25, 1979, with similar terms and conditions, except that zinc was no longer limited (not being discharged at levels of concern) and BOD5 was limited. That permit expired on June 30, 1981.
24. A permit reissued on March 29, 1985, contained similar terms and conditions, but no longer authorized discharge from Outfall 001. In addition, phosphorus was no longer limited. Discharges from Outfall 002 ceased on April 1, 1989, based on correspondence from DuPont to the State of Indiana. The permit expired on February 28, 1990. Respondent continues to operate under the expired permit and discharge from Outfall 003 pursuant to state law.
25. Wastewater from Outfall 003 is equalized, treated with lime (or polymer) to precipitate solids, clarified, adjusted for

TABLE 2

OUTFALLS HISTORICALLY USED AT DuPONT

OUTFALL NUMBER	PRODUCTION TRIBUTARY TO OUTFALL/WASTE PRODUCED	WASTE TREATMENT	YEAR CEASED DISCHARGE
001 or E-1	Freon Products/Water from Purification Sulfuric Acid/Fume Scrubber Nitric Acid/Fume Scrubber Reagent Ammonium Hydroxide/ Fume Scrubber Water Sulfamic Acid/Cooling and Scrubber Water	None Neutralization	to new 002 1975
002 or E-2	Sulfuric Acid/Cooling Water from Scrubbing and Absorption	None	to new 002 1975
003 or E-3	Power Generation/Spent Regenerant from Ion Exchange	None	to new 001 1975
004 or E-4	Sulfuric Acid/Scrubber Water	None	to new 002 1975
005 or E-5	Aluminum Chloride Solution/Mud from Filtration and spent regenerant from ion exchange Ag-Chem Products/Cooling Water	None	to new 002
006 or E-6	Aluminum Chloride Solution/Mud from Filtration and spent regenerant from ion exchange Ag-Chem Products Cooling Water	None	1972, diverted to 001
007 or E-7	Sodium Silicate/Cooling water from furnace and evaporation/crystallization	None	to new 003 1975
008 or E-8	Ludox/Spent regenerant from ion exchanger	Neutralization	to new 003 1975
009 or E-9	Ludox/spent filter aid	2 stage settling	to new 003 1975
010 or E-10	Unknown/Underflow from basin	None	to new 003 1975

pH, monitored and discharged. This permitted wastewater treatment system is the source of wastes that are either recycled, disposed of on-site, or historically discharged through several outfalls to the Grand Calumet River.

26. Based on information available to U.S. EPA, the Facility historically discharged contaminated wastewater into the Grand Calumet River, including but not limited to the following contaminants:
- a. arsenic compounds, including calcium arsenate and lead arsenate, manufactured from 1919-1949
 - b. lead compounds manufactured from 1919-1949
 - c. chromium compounds used in cooling tower blowdown water from 1948-1977
 - d. antimony, including antimony pentachloride used as a catalyst from 1948 to 1977
 - e. zinc and zinc compounds manufactured from 1909 to 1969
 - f. waste acids, including hydrochloric and sulfamic acids

ENVIRONMENTAL SETTING

Land Use

27. The Facility is located in East Chicago, Indiana. The population within four miles of the site has been estimated at 170,000. The western boundary of the Facility borders Kennedy Avenue in East Chicago. The southern boundary of the Facility borders the Grand Calumet River, with the River flowing in a westerly direction past the site. The northern boundary of the Facility is located due south of the Indiana

Harbor Belt Railroad tracks. The eastern portion of the Facility property is located on natural dune and swale that extends from the northern boundary southward to the banks of the Grand Calumet River.

28. Land use in the area surrounding the Facility is primarily heavy industry and commercial industries, including a former lead smelter directly to the west (U.S.S. Lead) and the Gary Municipal Airport located east of the Facility. The nearest residential areas are approximately 1,000 feet north of the waste management units in the central portion of the Facility.

Geology

29. The Facility is located in the Calumet Lacustrine Plain physiographic province which extends across the northern quarter of Lake County and the northern tenth of Porter County. The area is part of the Northern Moraine and Lake Region which is characterized by a variety of glacial land forms. The Lake Michigan shoreline, located within the bed of ancient Lake Chicago (present-day Lake Michigan), is the lowest elevation in Lake County. The present shoreline of Lake Michigan developed 10,000 or 12,000 years ago with three relict shorelines capped by sand dunes, representing successively lower stages of glacial Lake Chicago. These eolian dune deposits are referred to as the Calumet Beach deposits.

30. The Lake County area is located on the Kankakee Arch bedrock formation which is a bedrock high, separating the Michigan Basin to the northeast from the Illinois Basin to the southwest. The average structural dip of the saddle-like bedrock deposit is 5 to 7 feet per mile.
31. The original regional topography and drainage of the area has been altered by decades of industrial development. The direction of flow of the Grand Calumet river was reversed with the blockage of its outlet to the east, and the construction of the Indiana Harbor Canal in 1901-1906. The Calumet Sand was deposited on glacial till and/or lacustrine clay. The till consists of a stiff, gray, silty clay matrix with pebbles and rock fragments. The thickness of the till and lacustrine clays is between 100-150 feet.
32. Soils at the Facility fall into three categories: Carlisle muck at low-lying lands adjacent to the Grand Calumet River; Tawas muck soils found in both the northern third and southwest corner of the property; and Oakville-Tawas Complex soils in the undeveloped area of the site that covers the eastern two-fifths of the property. Soils in the manufacturing area have been regraded and covered with fill, but were most likely of the Oakville-Tawas Complex before development.

Hydrogeology

33. The uppermost or water table aquifer underlying the Facility is the Calumet Sand aquifer. The saturated thickness ranges

from 20 to 45 feet (U.S. EPA, USGS, 1989). Near the Facility, the aquifer is capable of producing 40-150 gallons per minute.

34. Rainfall and surface infiltration are the major recharge sources for the Calumet Sand aquifer. Recharge is affected by the precipitation rate and the permeability of overlying soils. Groundwater discharge locally occurs to sewers owned by the East Chicago Sanitary District, and to the Grand Calumet River. Site-specific groundwater data from well logs show that the thickness of the Calumet Sand aquifer system varies from 27 to 34 feet over the Facility, with the average saturated thickness of the sand deposit being 24 to 31 feet. The water table at the site was encountered at 0 to 8 feet below grade.

Table 3-1 of DuPont's Phase II Groundwater Assessment report contains a summary of monitoring well construction. In addition, 4 staff gauges were installed. Other groundwater data is also available for the plant site, from 1985-1987 USES work (6 wells), and a 1990 study of groundwater quality at the Conoco property (4 wells). The location of these wells is identified in Figure 1-4 of DuPont's Phase II Groundwater Assessment report.

35. The information collected for the site indicates a groundwater divide running east-west through the center of the Facility. The direction of groundwater flow at the Facility is both to the south towards the East Branch of the

Grand Calumet River, and north towards a residential area of East Chicago known as Riley Park. No evidence of groundwater flow reversal from the River to the Calumet Sand aquifer was observed.

36. An annual average horizontal hydraulic conductivity of 13 ft/day was computed from the data collected. Estimated average groundwater conductivities within the aquifer south towards the River were estimated at .22 to .24 feet/day. Using this information, and assuming groundwater is discharged to the River along the entire length of the site, the discharge to the River from the site was estimated to range from 71 to 78 g.p.m. (June to August 1990). The predicted rate to the north from the site ranged from 28 to 71 g.p.m.. Groundwater and surface water at the site are connected hydraulically, based on staff gauge readings.

FLOOD PLAIN AND SURFACE WATER

Lake Michigan

37. The 100-year flood plain elevations for Lake Michigan as documented in Flood Insurance Rate Maps and prepared by the Federal Insurance Administration, indicate flooding from Lake Michigan is not a concern. Lake Michigan is a major source of public drinking water as well as water for industrial use. The lake is also used for recreation.

Grand Calumet River

38. The Grand Calumet River originates from two lagoons known as the Marquette Park Lagoons located in the Indiana Dunes

National Lakeshore and the eastern portion of the U.S. Steel-Gary Works (U.S. Steel). These headwater lagoons have no measurable velocities, but a net flow to the west is detectable in the small channel connecting the two lagoons. The Grand Calumet River does not present a major flooding potential since the river is primarily composed of industrial cooling and process waters and waste treatment plant effluents. Water flows westerly from the west lagoon through culverts under an access road to the open channel of the river. Approximately 9 miles from the west lagoon, the river flows along the southern edge of the Facility in a westerly direction.

39. Use of the river is presently limited to industrial purposes, with no known utilization as potable water supply. People have been observed to use the River for limited recreational purposes, including canoeing and fishing. The Facility is permitted to discharge to the river through one outfall (outfall 003), and has applied to the State of Indiana for a general permit to discharge storm water from the site through a separate outfall (outfall 004).

RELEASE AND POTENTIAL RELEASE PATHWAYS

Soil/Ground Water

40. Permeable fill and urban soils exist over much of the Facility, underlain by large expanses of sand deposits, silt and clay from the Calumet Lacustrine Plain. Contaminants could migrate laterally through these soils to the Grand

Calumet River, and off-site northward towards East Chicago's Riley Park neighborhood. The ground water generally occurs in the glacial lacustrine layer and provides a primary route for contaminant migration from waste management unit leachate, surface spills, surface impoundment leakage, and leakage from sewers or above ground tanks.

41. The residential areas surrounding DuPont obtain their drinking water from public water supplies. Ground-water use for drinking water purposes in the vicinity of the Facility is very limited, with no groundwater withdrawal wells known to exist down gradient of the site.
42. The Calumet sand aquifer is generally not used for water supply purposes; however, the aquifer discharges into the Grand Calumet River, which discharges into Lake Michigan. Most of the potable water used in the vicinity of the Calumet aquifer is obtained from Lake Michigan. The deeper bedrock aquifers are generally used for high capacity industrial purposes.
43. Ground water monitoring was initiated at the Facility in 1990. The original monitoring system was designed and installed by a contractor, CH2M Hill, who has planned and implemented most of the ground water monitoring activities at the Facility since that time. Data indicates that ground water contaminants migrate to the Grand Calumet River, where local ground water discharge occurs. The groundwater discharge rate of 78 gallons per minute from the Facility to

the Grand Calumet River represents approximately 0.04 percent of the low flow value for the Grand Calumet River.

44. The Facility has extensive underground piping for both process and sanitary sewer systems, and the integrity of these units is unknown. There is potential for release of hazardous constituents from the units.

Surface Water

45. Wastewater from the Facility's treatment plants is recycled or discharged to the Grand Calumet River under an NPDES permit. Storm water runoff is directed to ground water, the wastewater treatment plant and the Grand Calumet River. In the past, it was reported that storm water from the center and western portion of the Facility was directed to the northern portion of the Facility and allowed to seep into a new 200' by 5' deep cinder trench (see July 20, 1973 letter and attachments from J.T Sixsmith, DuPont to Oral Hert, Indiana Stream Pollution Control Board); similarly, storm water from the eastern portion of the Facility was reportedly directed to an existing settling pit from which it will overflow into the low sandy area east of Freon Products and soak into the soil. Therefore, there is a potential for discharge of contaminants through the runoff from the Facility, to both surface and ground waters.
46. Releases of contaminants from groundwater seeps at the Facility to the Grand Calumet River have been independently documented by U.S. EPA and Respondent, with information from

Respondent reported to U.S. EPA in response to an information request under the Clean Water Act. The impact of such releases was estimated by DuPont in subsequent documentation to U.S. EPA after publication of its Phase II groundwater assessment dated August 1991.

Air

47. Releases to the air occurred in the past (1972) at the Facility from the open burning of approximately 1000 55 gallon drums, containing methyl ethyl ketone (F005/U159) and organic sludge wastes at WMU 15 (located within WMU 2), located at the east end of the Facility. The Facility has also been permitted by the City of East Chicago Department of Air Quality Control to operate its silicate furnace and 3 boilers. Air releases may have also occurred in the past during the dry formulation and packaging of various products at the Facility, including pesticides and herbicides. The releases resulted from air emissions being vented directly to the atmosphere.

Subsurface Gas

48. The Facility has extensive underground piping for Process Sewer Systems (e.g., gravity sewer for wastes), and the integrity of these units is unknown. There is potential for subsurface gas generation from these units as well as for sanitary sewers.

RELEASES AND POTENTIAL RELEASES

49. Releases of hazardous wastes, hazardous constituents and/or constituents listed at 40 C.F.R. Part 264 Appendix IX have occurred in the past from the Facility. These wastes or constituents have been detected in groundwater and/or soil the Facility, or sediments in the Grand Calumet River and adjacent wetlands, as is described below. Other releases besides those described below have also occurred.
50. Periodically, flue dust from its sodium silicate furnace and flue dust and waste chrome refractory brick from furnace rebuilds have been stored on site. The last such incidence was in 1991, and shipment off-site occurred in 1993. The flue dust was stored in 55 gallon drums, and the refractory brick was reportedly stored in an unpermitted waste pile and later transferred to 55 gallon drums. These wastes were tested and determined to be characteristic hazardous wastes for chrome and have been assigned the U.S. EPA hazardous waste number D007. Hazardous wastes or hazardous constituents entering the groundwater from these wastes could migrate north toward the Riley Park neighborhood and south toward the Grand Calumet River.
51. During 1972, DuPont disposed of approximately 1000 drums of methyl ethyl ketone (F005/U159) and an organic sludge via open burning. See documents DEC 0011052, letter from DuPont dated July 28, 1972 to the East Chicago Department of Air Quality Control, and document DEC 0010107-001, East

Chicago's response dated July 31, 1972, granting a conditional open burning permit. The open burning of this waste took place in the area of WMU #15. (DuPont 9/17/93 response to RCRA § 3007 information request.) The empty drums were then shipped off-site.

52. DuPont discarded or stored pesticides on-site at WMU's 4, 15, 22, 28 and 32, as described in CH2M Hill's Phase 1 Report which may have resulted in a release to the environment.
53. DuPont disposed of excess hydrochloric acid (HCl) in an HCl neutralization pit, WMU 8, from 1948-1977. Records were not kept regarding the quantities of excess acid disposed in this manner, except for certain years. These quantities were estimated in 1965 through 1970 to total 10,310,000 pounds. Other wastes disposed of in this area included wastes from its trichlorofluoromethane (TCFM or Freon) process, which contained boron, arsenic, chromium, and antimony pentachloride ($SbCl_5$) (80 tons from 1949-1967). The acid was mixed with sodium hydroxide (NaOH) to neutralize it. Runoff from this area may have gone to WMU 13 (chrome cooling water outfall). This outfall was, therefore, a potential site for releases to the Grand Calumet River of a number of hazardous constituents, including arsenic, chromium and antimony.
54. Sulfur was disposed of in the northeast section of the Facility, based on an interview conducted 12/3-5/86, with

Archie Murrish of DuPont, by CH2M Hill representatives.

(See Document 0010927-013). This sulfur disposal area may have resulted in a release of carbon disulfide to the groundwater in this portion of the Facility.

55. Inorganic constituents were detected in the shallow ground water at the Facility. At a minimum, parameters detected in the ground water at elevated concentrations at the Facility include: arsenic, chloride, fluoride, iron, magnesium, manganese, nitrogen (both ammonia and TKN), phosphate, sodium, sulfate and zinc. Hazardous wastes or hazardous constituents in the ground water have been documented to be migrating south towards the Grand Calumet River, or north towards the Riley Park neighborhood in East Chicago. Using conservative assumptions, several of the constituents, including arsenic, barium, boron, calcium, chloride, phosphate, sulfate and zinc, exceed 1 percent of the total loadings of the Grand Calumet River.
56. Drinking water maximum contaminant levels (MCLs) for arsenic, barium, cadmium, fluoride and lead were exceeded in samples from various locations on the Facility. In addition, heavy metals contamination is present in the sediments and wetlands of the Grand Calumet River bordering the Facility, including the following: antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.
57. Elevated organic constituents, including carbon disulfide, phenol, 1,1-dichloroethane, 1,2-dichloroethane, 1,1,1-

trichloroethane, and chloroform were detected in the ground water. These hazardous wastes or hazardous constituents could potentially migrate south towards the Grand Calumet River, or north towards the sewers of the East Chicago Sanitary District in the Riley Park neighborhood. The concentration of 1,2-dichloroethane exceeded federal MCLs for drinking water at one site.

58. Some of the hazardous wastes or hazardous constituents identified in ground water at the Facility or sediments or wetlands adjacent to the Facility as identified in Attachment I, Figure 1, are listed as systemic toxicants and/or known or suspected carcinogens by the U.S. EPA, including antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc. These constituents may pose a threat to human health and the environment, and have the following characteristics (Information sources are Integrated Risk Information System (IRIS), Public Health Risk Evaluation Data Base (PHRED), and U.S. EPA Water Quality Criteria (WQC)):
- a. Antimony is classified as a toxicant by the U.S. EPA. Antimony is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. U.S. EPA has developed acute and chronic ambient WQC for the protection of freshwater aquatic life at 88 micrograms per liter ($\mu\text{g/L}$) and 30 $\mu\text{g/L}$, respectively. For the protection of human health from the toxic properties of

antimony ingested through water and contaminated aquatic organisms, the ambient water criterion is 146 $\mu\text{g/L}$; for ingestion of contaminated aquatic organisms exclusive of the water, the ambient water criterion is 45,000 $\mu\text{g/L}$.

U.S. EPA has established an ambient water quality criterion for the protection of human health at 30 $\mu\text{g/l}$, and has promulgated a drinking water standard of 6 $\mu\text{g/l}$, and proposed a goal (Maximum Contaminant Level Goal (MCLG)) of 3 $\mu\text{g/l}$. U.S. EPA has established a CERCLA reportable quantity (RQ) of 5,000 pounds for spills.

Antimony pentachloride catalyst was used in the production of TCFM (1948-77) at the Facility; the spent catalyst was disposed of in an on-site settling basin (WMU #23). Records also indicate that antimony pentachloride was disposed of in the hydrochloric acid neutralization pit (WMU #8).

- b. Arsenic is classified by U.S. EPA as a toxicant, and a human carcinogen. Arsenic is listed as a carcinogenic priority pollutant in U.S. EPA water quality criteria. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life for arsenic (III) at 360 $\mu\text{g/L}$ and 190 $\mu\text{g/L}$, respectively. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life for arsenic (V) at 850 $\mu\text{g/L}$. For the protection of human health from the toxic properties of arsenic, the ambient water criterion is

0.018 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms; for ingestion of contaminated aquatic organisms exclusive of the water, the ambient water criterion is 0.14 $\mu\text{g/L}$. U.S. EPA has established an ambient water quality criterion for the protection of health at 0.002 $\mu\text{g/l}$, and has promulgated a drinking water standard of 50 $\mu\text{g/l}$ of arsenic, and a MCLG of 50 $\mu\text{g/l}$. U.S. EPA has established a CERCLA RQ of 1 pound for spills.

Arsenic was used in the production of insecticide compounds at the DuPont plant between 1910-1949, including lead arsenate, calcium arsenate, and arsenate green. An area along the south side of the north roadway, located south of WMU #1, was used as a burial ground for lead arsenate sludge generated in the agricultural chemicals (AgChem) production area. It was sluiced in a long trench and then covered with soil in the early 1950s. The exact quantities of lead arsenate sludge disposed at this location are unknown. Other potential sources of arsenic contamination at the Facility include one of the miscellaneous pits/piles (WMU 33) north of monitoring well (MW) 19; the insecticide area (WMU 22); the former AgChem production area (near WMU 28), a lead arsenate sludge disposal site near WMU 5; and the zinc roasters (WMU 34). From 1941 to 1974, arsenic was also disposed in the HCl

neutralization pit (WMU 8), at a rate of approximately 1 to 15 pounds per day. Overflow from the HCl pit was discharged to the Grand Calumet River through WMU 13, the old Chrome Outfall. No discharge of arsenic was authorized from this outfall. Arsenic contamination has been found in the ground water at the Facility, and in the ground water discharging from the Facility towards the Grand Calumet River. Arsenic contamination at levels as high as 4,900 mg/kg (dry weight) has been found in the Grand Calumet River sediments adjacent to the Facility, and also at levels over 700 mg/kg in adjacent wetlands, based on sediment sampling conducted for U.S. Steel by a contractor, Floyd Browne Associates, Inc. (FBA), during the spring/summer of 1991, and reported in January 1993.

- c. Cadmium is classified by U.S. EPA as a toxicant and a probable human carcinogen. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life at 3.9 $\mu\text{g/L}$ and 1.1 $\mu\text{g/L}$, respectively. For the protection of human health from the toxic properties of cadmium, the ambient water quality criterion is 10 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms. U.S. EPA has promulgated a drinking water standard of .005 milligrams per liter (mg/L) for cadmium, and a MCLG of .005 mg/L. U.S. EPA has established a CERCLA RQ of 10 pounds for

spills. Cadmium was generated at the Facility as an impurity from scrubbing of zinc ores after roasting and vaporization. The waste scrubber material, which contained cadmium, was land filled in an area within WMU 33. Cadmium contamination at levels as high as 40 milligrams per kilogram (mg/kg) has been found in the Grand Calumet River sediments adjacent to the Facility, and at levels as high as 230 mg/kg in soft side samples adjacent to the Facility, based on sediment sampling conducted for U.S. Steel by FBA.

- d. Chromium in the hexavalent (VI) valence state, and certain of its compounds are designated a human carcinogen by the U.S. EPA Carcinogen Assessment Group. Chromium is also considered to be a toxicant. Hexavalent chromium mobility in soil is largely a function of Eh and pH. Hexavalent chromium is more mobile under oxidizing and alkaline conditions. Chromium (VI) is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. U.S. EPA has developed acute and chronic WQC for chromium (VI) for the protection of freshwater aquatic life at 16 $\mu\text{g/L}$ and 11 $\mu\text{g/L}$, respectively. For the protection of human health from the toxic properties of chromium (VI), the ambient water criterion is 170 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms; for ingestion of contaminated aquatic organisms exclusive of the

water, the ambient water criterion is 3,400 $\mu\text{g/L}$. U.S. EPA has established an ambient water quality criterion for the protection of health at 50 $\mu\text{g/l}$ for hexavalent chromium, and has promulgated a drinking water standard of 100 $\mu\text{g/l}$ total chromium. U.S. EPA has established a CERCLA RQ of 1 pound for spills.

About 5 lbs/day of hexavalent chromium was used between 1948-1977) as a corrosion-inhibitor for TCFM cooling tower blowdown water, which was discharged to the Grand Calumet River through outfall 001, WMU 13. Chromium contamination at levels as high as 500 mg/kg (dry weight) has been found in the Grand Calumet River sediments adjacent to the Facility, and at levels in excess of 600 mg/kg in adjacent wetlands, based on sediment sampling conducted for U.S. Steel by FBA.

- e. Copper is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. Besides electrical products, copper compounds are also used as agricultural pesticides, and as algicides used in water purification. Copper is strongly bioaccumulated, due to complexes formed with organic compounds in natural systems. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life at 18 $\mu\text{g/L}$ and 12 $\mu\text{g/L}$, respectively (based on total concentrations at a hardness of 100 mg/L). For the protection of human health from the toxic properties of copper, the ambient

water criterion is 1,300 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms. U.S. EPA has also promulgated a drinking water action level of 1,300 $\mu\text{g/L}$. Copper was used in the production of Bordeaux mixture insecticide at the Facility between 1910-1949. Copper contamination at levels as high as 3,400 mg/kg (dry weight) has been found in the Grand Calumet River sediments adjacent to the Facility, based on sediment sampling conducted for U.S. Steel by FBA.

- f. Lead is classified by U.S. EPA as a toxicant, and a probable human carcinogen. Lead is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. Bioaccumulation of lead has been documented for aquatic organisms such as fish. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life at 82 $\mu\text{g/L}$ and 3.2 $\mu\text{g/L}$, respectively (based on total concentrations at a hardness of 100 mg/L). For the protection of human health from the toxic properties of lead, the ambient water criterion is 50 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms. U.S. EPA has promulgated a drinking water standard (action level) of 15 $\mu\text{g/l}$ of lead at the tap, and an MCLG of 0 $\mu\text{g/l}$. U.S. EPA has established a CERCLA RQ of 10 pounds for spills of lead, lead compounds, and lead-containing wastes. Lead was used at the Facility in the production of

inorganic insecticides and other compounds, including lead arsenate (1910-1949), lead arsenate phenothione (1946-1947), and lead acetate (1910-1914). Lead contamination at levels as high as 34,000 mg/kg (dry weight) has been found in the Grand Calumet River sediments and at levels as high as 9,000 mg/kg in wetlands adjacent to the Facility, based on sediment sampling conducted for U.S. Steel by FBA.

- g. Soluble salts of nickel are classified as toxicants by the U.S. EPA. Nickel is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life at 1,400 $\mu\text{g/L}$ and 160 $\mu\text{g/L}$, respectively, at 100 mg/L hardness, total concentration. For the protection of human health from the toxic properties of nickel, the ambient water criterion is 13.4 $\mu\text{g/L}$ for ingestion of water and contaminated aquatic organisms; for ingestion of contaminated aquatic organisms exclusive of the water, the ambient water criterion is 100 $\mu\text{g/L}$. U.S. EPA has promulgated a drinking water standard of 100 $\mu\text{g/l}$. U.S. EPA has established a CERCLA RQ of 100 pounds for spills.

Nickel contamination at levels as high as 2,700 mg/kg (dry weight) has been found in the Grand Calumet River

sediments adjacent to the Facility, based on sediment sampling conducted for U.S. Steel by FBA.

- h. Zinc and zinc compounds are classified by U.S. EPA as a toxicant. Zinc is listed as a non-carcinogenic priority pollutant in U.S. EPA water quality criteria. U.S. EPA has developed acute and chronic WQC for the protection of freshwater aquatic life at 120 $\mu\text{g/L}$ and 110 $\mu\text{g/L}$, respectively (at 100 mg/L hardness). There are currently no published federal water criteria for the protection of human health from the toxic properties of zinc. U.S. EPA has established a CERCLA RQ of 1000 pounds for spills.

Between 1909-1969, large-scale zinc processing (crude milling) was conducted at the Facility. Many spills of material, including zinc chloride and zinc aluminum chloride, have been documented. The Facility operated zinc roasters for the processing of zinc sinters, iron sinters, and zinc sulfide from 1916-1937 and 1947-1967. DuPont also produced zinc mud (zinc filter press sludge cake) from zinc chloride between 1909-69. Zinc levels in the ground water at the Facility are elevated, with values as high as 227 mg/L detected near the zinc crude milling area. The sources of the zinc in the ground water at the Facility are potentially the zinc crude milling area (WMU 24), the zinc mud area (WMU 35), the rubble area (WMU 2), and the zinc roasters area (WMU

34). The Facility experienced a series of large acid spills during the late 1970s, causing zinc mud sludges to be flushed out from process sewers into the Grand Calumet River. Zinc contamination at levels as high as 4,100 mg/kg and 110,000 mg/kg (dry weight) has been found in the Grand Calumet River sediments and in soft side samples adjacent to the Facility, respectively, based on sediment sampling conducted for U.S. Steel by FBA.

Note that all WQC cited for protection of freshwater aquatic life are for total concentrations, not dissolved.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the foregoing findings of fact and after consideration of the Administrative Record, the Chief, Enforcement and Compliance Assurance Branch, Waste, Pesticides and Toxics Division, has made the following conclusions of law and determinations:

1. Respondent is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. § 6903(15) and 329 Indiana Administrative Code (IAC) 3-1-4 (40 C.F.R. § 260.10).
2. Respondent is the owner or operator of a Facility that has operated, is operating, should be, or should have been operating under interim status subject to § 3005(e) of RCRA, 42 U.S.C. § 6925(e).
3. Solid wastes found at the Facility are hazardous wastes and/or hazardous constituents pursuant to Section 1004(5) of

RCRA, 42 U.S.C. § 6903(5). These are also hazardous wastes or constituents within the meaning of Section 3001 of RCRA, 42 U.S.C. § 6921 and 40 C.F.R. Part 261.

4. There is or has been a release of hazardous wastes or hazardous constituents into the environment from the Facility.
5. Releases from the Respondent's Facility have impacted the ground water, wetlands, surface water, and sediments. Limited access from the Grand Calumet River presents potential contact by the public with contaminated soils, sediments, and wetlands at and from the Facility.
6. U.S. EPA concludes that the potential exists for hazardous wastes or hazardous constituents to further migrate from the Facility into the environment via the following pathways: air, ground water, point sources and surface overland flow (storm water runoff), and that the hazardous wastes or hazardous constituents may pose a threat to human health and the environment.
7. The Chief, Enforcement and Compliance Assurance Branch of the Waste, Pesticides and Toxics Division, U.S. EPA, Region 5, has determined that the actions ordered below are necessary to protect human health and the environment.

VII. PROJECT COORDINATOR

1. Within ten (10) days of the effective date of this Order, U.S. EPA and Respondent shall each designate a Project Coordinator and shall notify each other in writing of the

Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the full and complete implementation of this Order and for designating a person to act in his/her absence. The U.S. EPA Project Coordinator will be U.S. EPA's designated representative for the Facility. To the maximum extent practicable, all communications between Respondent and U.S. EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to this Order shall be directed through the Project Coordinator.

2. The parties may change their Project Coordinator but agree to provide at least thirty (30) days written notice prior to changing a Project Coordinator.
3. The absence of the U.S. EPA Project Coordinator from the Facility shall not be cause for the cessation of work.
4. If the U.S. EPA Project Coordinator determines that activities in compliance or noncompliance with this Order, have caused or may cause a release of hazardous waste, hazardous constituent, or a pollutant or contaminant, or a threat to public health or to the environment, U.S. EPA may order Respondent to stop further implementation of this Order for such a period of time as may be needed to abate any such release or threat and/or undertake any action which U.S. EPA determines is necessary to abate such release or threat.

VIII. WORK TO BE PERFORMED

1. Pursuant to § 3008(h) of RCRA 42 U.S.C. § 6928(h), Respondent agrees to and is hereby ordered to perform the acts specified in this section, in the manner and by the dates specified herein. All work undertaken pursuant to this Order shall be performed in a manner consistent with, at a minimum: the attached Scopes of Work; all U.S. EPA-approved work plans or reports, including an IM sediment and wetlands investigation; the RFI Work plan and Report; the CMS Report; all other Work plans; RCRA and its implementing regulations; and applicable U.S. EPA guidance documents. Guidance may include, but is not limited to, documents listed in Attachment V to this Order, which are incorporated by reference as if fully set forth herein.
2. Respondent shall, in accordance with the RCRA Corrective Action requirements under 42 U.S.C. § 6928(h), complete all necessary remediation of the northern, northeastern, and eastern portions of the Facility outside and adjacent to the Ludox production building, which stored both the hazardous flue dust and refractory brick waste (D007) for greater than two (2) years. Respondent shall identify, at a minimum, the northern, northeastern, and eastern portions of the Facility as SWMUs in the RCRA Facility Investigation phase of the RCRA Corrective Action, and proceed with remediation of the area under RCRA Corrective Action as agreed upon or otherwise required by U.S. EPA.

3. Respondent shall complete closure of the solid waste landfill where filter cake (generated from clarification of wastewater discharged to Outfall 003) is currently being disposed in accordance with the Interim Closure Plan submitted by DuPont to IDEM on March 27, 1997. DuPont shall complete monitoring and remediation for off-site releases to groundwater as agreed upon or otherwise required by U.S. EPA.

RCRA CORRECTIVE ACTION PLAN

A. Interim Measures

1. Respondent shall implement the Sediment and Wetlands Investigation Plan as an Interim Measure (IM). The Sediment and Wetlands Investigation Plan is attached hereto as Attachment I. The Sediment Investigation Plan shall be carried out, at a minimum, in accordance with Attachment I of this Order, RCRA, its implementing regulations, and relevant U.S. EPA guidance documents and all other applicable laws and regulations.
2. In the event the Respondent identifies a current or potential threat to human health or the environment, the Respondent shall notify U.S. EPA and IDEM orally within twenty-four (24) hours and in writing within fourteen (14) days, summarizing the immediacy and magnitude of any potential threat to human health or the environment. Within thirty (30) days of the written notification to U.S. EPA, the Respondent shall submit to U.S. EPA for

approval an IM Work plan consistent with Attachment II, Appendix A of this Order that identifies the individual stabilization measures which mitigate this threat and are consistent with and integrated into any long-term solution at the Facility. The IM Work plan shall include: Objectives; a Health and Safety Plan; a Community Relations Plan; a Data Collection Quality Assurance Program; a Data Management program; Design Plans and Specifications; an Operation and Maintenance Plan; a Project Schedule; Construction Quality Assurance Plan; and Reporting Requirements.

3. Hereinafter, all work required in Attachment II, Appendix A shall be referred to as the "IM Work plan".

B. RCRA Facility Investigation

1. Respondent shall conduct a RCRA Facility Investigation (RFI) in accordance with the RFI Scope of Work set forth in Attachment II, including the schedules set forth therein. Respondent shall submit to U.S. EPA the Description of Current Conditions Report prepared in accordance with Section I of Attachment II within one hundred twenty (120) days of the effective date of the Order. Reports submitted pursuant to Section I of Attachment II will be reviewed by U.S. EPA, but not subject to U.S. EPA approval.
2. Within two hundred and ten (210) days of the effective date of this Order, Respondent shall submit to U.S. EPA

a work plan for a RCRA Facility Investigation (RFI Work plan). The RFI Work plan is subject to approval by U.S. EPA and shall be performed in a manner consistent with the RFI Scope of Work contained in Attachment II.

Attachment II to this Order is incorporated by reference as if fully set forth herein. The RFI Work plan shall be developed at a minimum in accordance with RCRA, its implementing regulations, and relevant U.S. EPA guidance documents.

3. The RFI Work plan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes or hazardous constituents within and beyond the Facility boundary that are related to the Facility. The RFI Work plan shall document the procedures the Respondent shall use to conduct those investigations necessary: (1) to characterize the potential pathways of contaminant migration; (2) to characterize the source(s) of contamination; (3) to define the degree and extent of contamination; (4) to identify actual or potential receptors; and (5) to support the development of alternatives from which a corrective measure will be selected by U.S. EPA. A specific schedule for implementation of all activities shall be included in the RFI Work plan.

4. In accordance with the provisions of Attachment II, Section II, the RFI Work plan shall include: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; (3) a Data Management Plan; (4) a Health and Safety Plan; and (5) a Public Involvement Plan.

C. Corrective Measures Study (CMS)

1. Within one hundred twenty (120) days after U.S. EPA approval of the RFI Report, Respondent shall conduct a CMS in accordance with the CMS Scope of Work in Attachment III. Attachment III to this Order is incorporated by reference as if fully set forth herein.
2. Upon U.S. EPA's selection of the corrective measures, if Respondent has complied with the terms of this Order, U.S. EPA shall provide a ninety (90) day period for negotiation of an Administrative Order on Consent for implementation of the selected corrective measure.

IX. PUBLIC PARTICIPATION AND COMMENT IN CORRECTIVE MEASURE(S) SELECTION

1. U.S. EPA will provide the public with an opportunity to review and comment on the final draft of the Corrective Measures Study Report and a description of U.S. EPA's proposed corrective measure(s), including U.S. EPA's justification for proposing such corrective measure(s) (the "Statement of Basis"). Such activity shall be conducted in accordance with the RCRA Enhanced Public Participation Rule (60 FR 63,417, December 11, 1995).

2. Following the public comment period, U.S. EPA will select a final corrective measure(s) or require Respondent to revise the CMS Report and/or perform additional corrective measures studies.
3. U.S. EPA will notify Respondent of the final corrective measure(s) selected by U.S. EPA in the Final Decision and Response to Comments (RTC). The notification will include U.S. EPA's reasons for selecting the corrective measure(s).

X. AGENCY APPROVALS/PROPOSED CONTRACTOR/ADDITIONAL WORK

1. After review of any plan, report or other item which is required to be submitted for approval pursuant to this Order, U.S. EPA, after reasonable opportunity for review and comment by the State, shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure its deficiencies; (d) disapprove, in whole or in part, the submission; or (e) any combination of the above.
2. In the event of approval, approval upon conditions, or modification by U.S. EPA, pursuant to paragraph 1. (a), (b), or (c), Respondent shall proceed to take any action required by the plan, report, or other item, as approved or modified by U.S. EPA subject only to their right to invoke the Dispute Resolution procedures set forth in Section XVII with respect to the modifications or conditions made by U.S. EPA. In the event that U.S. EPA modifies the submission to cure

its deficiencies pursuant to paragraph 1.(c) and the submission has a material defect, U.S. EPA retains its right to seek stipulated penalties, as provided in Section XVI.

3. Upon receipt of a notice of disapproval pursuant to paragraph 1.(d), Respondent shall, within sixty (60) days or such other time as specified by U.S. EPA in such notice, correct the deficiencies and resubmit the plan, report, or other item for approval. Any stipulated penalties applicable to the submission, as provided in Section XVI, shall accrue during the sixty (60) day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in paragraph 1.
4. Notwithstanding the receipt of a notice of disapproval pursuant to paragraph 1.(d), Respondent shall proceed, at the direction of U.S. EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of the submission shall not relieve Respondent from any liability for stipulated penalties under Section XVI (Stipulated Penalties).
5. In the event that a resubmitted plan, report, or other item, or portion thereof, is disapproved by U.S. EPA, U.S. EPA may again require the Respondent to correct the deficiencies, in accordance with the preceding paragraphs. U.S. EPA also retains the right to amend or develop the plan, report, or other item. Respondent shall implement any such plan,

- report, or item as amended or developed by U.S. EPA, subject only to their right to invoke the procedures set forth in Section XVII (Dispute Resolution).
6. If upon resubmission, a plan, report, or item is disapproved or modified by U.S. EPA due to a material defect, Respondent shall be deemed to have failed to submit such plan, report, or item timely and adequately. The provisions of Section XVII (Dispute Resolution) and Section XVI (Stipulated Penalties) shall govern the implementation of the work and accrual and payment of any stipulated penalties during Dispute Resolution. If U.S. EPA's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XVI (Stipulated Penalties).
 7. All plans, reports, and other items required to be submitted to U.S. EPA under this Order shall, upon approval or modification by U.S. EPA, be enforceable under this Order. In the event U.S. EPA approves or modifies a portion of a plan, report, or other item required to be submitted to U.S. EPA under this Order, the approved or modified portion shall be enforceable under this Order.
 8. All work performed pursuant to this Order shall be under the direction and supervision of a registered professional engineer, or certified geologist with expertise in hazardous waste cleanup. Within fourteen (14) days of the effective

date of this Order, Respondent shall notify U.S. EPA in writing of the name, title, and qualifications of the engineer or geologist, and any contractors or subcontractors and their personnel to be used in carrying out the conditions of this Order.

9. U.S. EPA may determine that certain tasks, including investigatory work or engineering evaluation, are necessary in addition to those tasks and deliverables included in the Work plans and Reports when new findings indicate such work is necessary to achieve the purpose of this Order. U.S. EPA shall request in writing that the Respondent perform the additional work and shall specify the basis and reasons for U.S. EPA's determination that the additional work is necessary. Within thirty (30) days after receipt of such request, Respondent shall have the opportunity to meet with U.S. EPA to discuss the additional work U.S. EPA has requested. Thereafter, Respondent shall perform the additional work U.S. EPA has requested according to an approved U.S. EPA Work plan. All additional work performed by Respondent under this paragraph shall be performed in a manner consistent with this Order.

XI. QUALITY ASSURANCE

1. Respondent shall follow U.S. EPA guidance for sampling and analysis. A Quality Assurance Project Plan (QAPjP) will be developed for all sampling and analysis conducted under this Order (Attachment V). Work plans shall contain quality

- assurance/quality control (QA/QC) and chain of custody procedures for all sampling, monitoring, and analytical activities. Any deviations from the QA/QC and chain of custody procedures in approved work plans must be approved by U.S. EPA prior to implementation; must be documented, including reasons for the deviations; and must be reported in the applicable report (e.g., RFI).
2. The contact person(s), name(s), addresses, and telephone numbers of the analytical laboratories Respondent proposes to use must be specified in the applicable work plan(s).
 3. All work plans required under this Order shall include data quality objectives for each data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended use(s).
 4. Respondent shall monitor to ensure that high quality data is obtained by its consultant or contract laboratories. Respondent shall ensure that laboratories used by Respondent for analysis perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846 Third Edition as amended by Update One, July 1992)," or other methods deemed satisfactory to U.S. EPA. If methods other than U.S. EPA methods are to be used, Respondent shall specify all such protocols in the applicable work plan (e.g., RFI). U.S. EPA may reject any data that does not meet the requirements of

the approved work plan or U.S. EPA analytical methods and may require resampling and additional analysis.

5. Respondent shall ensure that laboratories it uses for analyses participate in a QA/QC program equivalent to that which is followed by U.S. EPA. U.S. EPA may conduct a performance and QA/QC audit of the laboratories chosen by Respondent before, during, or after sample analyses. Upon request by U.S. EPA, Respondent shall have its laboratory perform analyses of samples provided by U.S. EPA to demonstrate laboratory performance. If the audit reveals deficiencies in a laboratory's performance or QA/QC, resampling and additional analysis may be required.

XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

1. Respondent shall submit to U.S. EPA upon request the results of all sampling and/or tests or other data generated by divisions, agents, consultants, or contractors pursuant to this Order.
2. Notwithstanding any other provisions of this Order, the United States and the State of Indiana retain all information gathering and inspection authorities and rights, including the right to bring enforcement actions related thereto, under the CWA, RCRA, CERCLA, and any other applicable State or federal statutes or regulations.
3. Respondent shall notify U.S. EPA in writing at least fifteen (15) days prior to beginning each separate phase of field work approved under any work plan required by this Order.

If Respondent believes it must commence emergency field activities without delay, Respondent may seek emergency telephone authorization from the U.S. EPA Project Coordinator or, if the U.S. EPA Project Coordinator is unavailable, his/her Section Chief, to commence such activities immediately. At the request of U.S. EPA, Respondent shall provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples collected by Respondent pursuant to this Order. Similarly, at the request of Respondent, U.S. EPA shall allow Respondent or its authorized representative(s) to take split or duplicate samples of all samples collected by U.S. EPA under this Order.

4. Respondent may assert a business confidentiality claim covering part of any information submitted to U.S. EPA pursuant to this Order. Any assertion of confidentiality must be accompanied by information that satisfies the items listed in 40 C.F.R. 2.204(e)(4) or such claim shall be deemed waived. Information determined by U.S. EPA to be confidential shall be disclosed only to the extent permitted by 40 C.F.R. Part 2. If no such confidentiality claim accompanies the information when it is submitted to U.S. EPA, the information may be made available to the public by U.S. EPA without further notice to Respondent. Respondent agrees not to assert any confidentiality claim with regard to any physical or analytical data.

XIII. ACCESS

1. U.S. EPA and/or IDEM, their contractors, employees, and/or any duly designated representatives are authorized to enter and freely move about the Facility pursuant to this Order for the purposes of, inter alia: interviewing Facility personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of Respondent in carrying out the terms of this Order; conducting such tests, sampling, or monitoring as deemed necessary; using a camera, sound recording, or other documentary type equipment; and verifying the reports and data submitted to U.S. EPA or IDEM by Respondent.

Respondent agrees to provide U.S. EPA and IDEM or their representatives access at all reasonable times to the Facility and subject to paragraph 2 below, to any other property to which access is required for implementation of this Order. Respondent shall permit such persons to inspect and copy all records, files, photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Order and that are within the possession or under the control of Respondent or its contractors or consultants.

2. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain access agreements necessary to complete work required by this Order

from the present owner(s) of such property within thirty (30) days of the date that the need for access becomes known to Respondent. Best efforts as used in this paragraph shall include, at a minimum, a certified letter from Respondent to the present owner(s) of such property requesting access agreement(s) to permit Respondent and its authorized representatives to access such property, and the payment of reasonable compensation in consideration of granting access. Any such access agreement shall provide for access by U.S. EPA and IDEM or their representatives. Respondent shall insure that U.S. EPA's Project Coordinator has a copy of any access agreement(s). In the event that agreements for access are not obtained within thirty (30) days of approval of any work plan for which access is required, or of the date that the need for access became known to Respondent, Respondent shall notify U.S. EPA in writing within fourteen (14) days thereafter of both the efforts undertaken to obtain access and the failure to obtain access agreements. U.S. EPA may, at its discretion, assist Respondent in obtaining access. In the event U.S. EPA obtains access, Respondent shall undertake U.S. EPA-approved work on such property.

3. The Respondent agrees to indemnify the United States as provided in Section XXII: Indemnification, for any and all claims arising from activities on such property.

4. Nothing in this section limits or otherwise affects U.S. EPA's right of access and entry pursuant to applicable law.
5. Nothing in this section shall be construed to limit or otherwise affect Respondent's liability and obligation to perform corrective action including corrective action beyond the Facility boundary, notwithstanding the lack of access.

XIV. RECORD PRESERVATION

1. Respondent shall retain, during the pendency of this Order and for a minimum of 6 years after its termination, all data, records, and documents now in its possession or control or which come into its possession or control which relate in any way to this Order or to hazardous waste management and/or disposal at the Facility. Respondent shall notify U.S. EPA in writing ninety (90) days prior to the destruction of any such records, and shall provide U.S. EPA with the opportunity to take possession of any such records. Such written notification shall reference the effective date, caption, and docket number of this Order and shall be addressed to:

Director, Waste Pesticides & Toxics Division
U.S. EPA, Region 5
77 West Jackson Boulevard, D-8J
Chicago, Illinois 60604-3590

2. Respondent further agrees that within thirty (30) days of retaining or employing any agent, consultant, or contractor for the purpose of carrying out the terms of this Order, Respondent will enter into an agreement with any such agents, consultants, or contractors whereby such agents,

consultants, and/or contractors will be required to provide Respondent a copy of all documents produced pursuant to this Order.

3. All documents pertaining to this Order shall be stored by the Respondent in a centralized location at the Facility to afford ease of access by U.S. EPA or its representatives.

XV. REPORTING AND DOCUMENT CERTIFICATION

1. Beginning with the first full month following the effective date of this Order, and throughout the period that this Order is effective, Respondent shall provide U.S. EPA with bi-monthly progress reports by the tenth day of the month in which the progress report is due. The progress reports shall conform to the requirements in the relevant Scopes of Work contained in Attachment I through IV.
2. Four (4) copies of all documents submitted pursuant to this Order shall be in writing and shall be hand delivered, sent by certified mail, return receipt requested, or by overnight express mail to:

U.S. EPA, Region 5
Waste, Pesticides & Toxics Division
Enforcement and Compliance Assurance Branch
77 West Jackson Boulevard, DRE-8J
Chicago, Illinois 60604-3590
Attn: DuPont-East Chicago Project Coordinator

Documents to be submitted to the Respondent should be sent to:

Stephen C. Ehrlich, P.E.
DuPont Company
Barley Mill Plaza, Building 27
P.O. Box 80027
Wilmington, DE 19880-0027

Documents to be submitted to the State of Indiana should be sent to:

Chris Myer
Corrective Action Section
Office of Solid and Hazardous Waste Management
Indiana Department of Environmental Management
100 N. Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015

Other addresses can also be designated by the Project Coordinators. All documents submitted pursuant to this Order shall be printed on recycled paper and shall be copied double-sided whenever practicable.

3. Any report or other document submitted by Respondent pursuant to this Order which makes any representation concerning Respondent's compliance or noncompliance with any requirement of this Order shall be certified by a responsible corporate officer of Respondent or a duly authorized representative. A responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation.
4. The certification required by paragraph three (3) above, shall be in the following form:

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in

accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____
 Name: _____
 Title: _____
 Date: _____

XVI. DELAY IN PERFORMANCE/STIPULATED PENALTIES

1. Unless there has been a written modification by U.S. EPA of a compliance date, a written modification by U.S. EPA of an approved work plan condition, or excusable delay as defined in Section XVIII: Force Majeure and Excusable Delay, if Respondent fails to comply with any term or condition set forth in this Order in the time or manner specified herein, Respondent shall pay stipulated penalties as set forth below upon written demand from U.S. EPA.
 - a. For failure to commence, perform, and/or complete field work in a manner acceptable to U.S. EPA or at the time required pursuant to this Order: \$2,000 per day for the first seven days of such violation, \$5,000 per day for the eighth through twenty-first day of such violation, and \$8,000 per day for each day of such violation thereafter;
 - b. For failure to complete and submit any work plans or reports (other than progress reports) in a manner

acceptable to U.S. EPA or at the time required pursuant to this Order, or for failure to notify U.S. EPA of immediate or potential threats to human health and/or the environment, new releases of hazardous waste and/or hazardous constituents and/or new solid waste management units not previously identified, as required by this Order: \$2,000 per day for the first seven days of such violation, \$5,000 per day for the eighth through twenty-first day of such violation, and \$8,000 per day for each day of such violation thereafter;

- c. For failure to complete and submit, other written submittals not included in paragraph 3 of this section in a manner acceptable to U.S. EPA or at the time required pursuant to this Order: \$1,000 per day for the first seven days of such violation, \$2,000 per day for the eighth through twenty-first day of such violation, and \$3,500 per day for each day of such violation thereafter;
 - d. For failure to comply with any other provisions of this Order in a manner acceptable to U.S. EPA: \$1,000 per day for the first seven days of such violation, \$2,500 per day for the eighth through twenty-first day of such violation, and \$3,500 per day for each day of such violation thereafter.
2. Penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs,

and shall continue to accrue through the day of correction of the violation. Nothing herein shall prevent the simultaneous accrual of separate stipulated penalties for separate violations of this Order. Penalties shall continue to accrue regardless of whether U.S. EPA has notified the Respondent of a violation.

3. All penalties owed to the United States under this Section shall be due and payable within thirty (30) days of the Respondent's receipt from U.S. EPA of a written demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XVII: Dispute Resolution. Such a written demand will describe the violation and will indicate the amount of penalties due.
4. Interest shall begin to accrue on any unpaid stipulated penalty balance beginning on the thirty-first day after Respondent's receipt of U.S. EPA's demand letter. Interest shall accrue at the Current Value of Funds Rate established by the Secretary of the Treasury. Pursuant to 31 U.S.C. § 3717, an additional penalty of 6% per annum on any unpaid principal shall be assessed for any stipulated penalty payment which is overdue for ninety (90) or more days.
5. All penalties shall be made payable by certified or cashier's check to the United States of America and shall be remitted to:

U.S. EPA, Region 5
P.O. Box 70753
Chicago, Illinois 60673

All such checks shall reference the name of the Facility, the Respondent's name and address, and the U.S. EPA docket number of this action. Copies of all such checks and letters forwarding the checks shall be sent simultaneously to the U.S. EPA Project Coordinator.

6. Respondent may dispute U.S. EPA's assessment of stipulated penalties by invoking the dispute resolution procedures under Section XVII: Dispute Resolution. The stipulated penalties in dispute shall continue to accrue, but need not be paid, during the dispute resolution period. Respondent shall pay stipulated penalties and interest, if any, in accordance with the dispute resolution decision and/or agreement. Respondent shall submit such payment to U.S. EPA within 7 days of receipt of such resolution in accordance with Paragraph 5 of this Section.
7. Neither the invocation of dispute resolution nor the payment of penalties shall alter in any way Respondent's obligation to comply with the terms and conditions of this Order.
8. The stipulated penalties set forth in this section do not preclude U.S. EPA from pursuing any other remedies or sanctions which may be available to U.S. EPA by reason of Respondent's failure to comply with any of the terms and conditions of this Order.
9. No payments under this section shall be tax deductible for Federal or State tax purposes.

XVII. DISPUTE RESOLUTION

1. The parties shall use their best efforts to informally and in good faith resolve all disputes or differences of opinion. The parties agree that the procedures contained in this section are the sole procedures for resolving disputes arising under this Order. If Respondent fails to follow any of the requirements contained in this section then it shall have waived its right to further consideration of the disputed issue.
2. If Respondent disagrees, in whole or in part, with any written decision (Initial Written Decision) by U.S. EPA pursuant to this Order, Respondent's Project Coordinator shall notify the U.S. EPA Project Coordinator of the dispute. The Project Coordinators shall attempt to resolve the dispute informally.
3. If the Project Coordinators cannot resolve the dispute informally, Respondent may pursue the matter formally by placing its objections in writing. Respondent's written objections must be directed to the U.S. EPA Project Coordinator and may be copied to the Chief of the Enforcement and Compliance Assurance Branch. This written notice must be mailed to such person(s) within fourteen (14) days of Respondent's receipt of the Initial Written Decision. Respondent's written objection must set forth the specific points of the dispute, the position Respondent claims should be adopted as consistent with the requirements

of this Order, the basis for Respondent's position, and any matters which it considers necessary for U.S. EPA's determination.

4. U.S. EPA and Respondent shall have fourteen (14) days from U.S. EPA's receipt of Respondent's written objections to attempt to resolve the dispute through formal negotiations. This time period may be extended by U.S. EPA for good cause. During such time period, (Negotiation Period) Respondent may request a conference with the Chief of the Enforcement and Compliance Assurance Branch to discuss the dispute and Respondent's objections. U.S. EPA agrees to confer in person or by telephone to resolve any such disagreement with the Respondent as long as Respondent's request for a conference will not extend the Negotiation Period.
5. If the parties are unable to reach an agreement within the Negotiation Period, Respondent has fourteen (14) additional days to submit any additional written arguments and evidence, not previously submitted, to the decision maker. Based on the record, U.S. EPA shall provide to Respondent its written decision on the dispute (U.S. EPA Dispute Decision) which shall include a response to Respondent's arguments and evidence. Such decision shall be incorporated into and become an enforceable element of this Order, but will not be considered final agency action for purposes of judicial review.

6. Except as provided in Section XVI (Delay in Performance/Stipulated Penalties), the existence of a dispute as defined in this Section and U.S. EPA's consideration of matters placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Order during the pendency of the dispute resolution process.
7. Respondent may request mediation within five (5) days of issuance of the U.S. EPA Dispute Decision if such decision involves a mediated matter as defined in paragraph 8, below. In the event of such a request, the parties agree to follow the procedures in paragraphs 8 through 15, below. Alternatively, U.S. EPA and Respondent may agree in writing to waive formal negotiations as outlined above and initiate mediation as outlined below. In this event, the references to mediation request should be changed to "the Initiation of Mediation".
8. For purposes of this section, Mediated Matters include: (1) the need for additional work beyond that required in Section VIII (Work to Be Performed), costing an additional \$250,000; (2) approval of the final RFI Report or CMS workplan; or (3) the existence of a force majeure event pursuant to Section XVIII (Force Majeure). Respondent may invoke the mediation process no more than three (3) times during the pendency of this Order.

9. The parties agree that they will share equitably the costs of mediation. U.S. EPA's Project Coordinator shall notify Respondent as to the extent of U.S. EPA's Region 5's ability to share equitably the costs of mediation within five (5) days of U.S. EPA's receipt of Respondent's request for mediation or within five (5) days of the date of the date of the parties' agreement to mediate pursuant to paragraph 7, above. This time period may be extended by the U.S. EPA Project Coordinator if necessary to determine the availability of U.S. EPA Headquarters' funds to share the costs of mediation. Once U.S. EPA notifies Respondent that it can equitably share the expenses of mediation, then the Parties shall follow the procedures below.
10. If the parties use U.S. EPA's Dispute Resolution Support Services contract, they agree to select a mediator(s) in accordance with the following procedures:
 - (a) Upon receipt of Respondent's request for mediation or the written agreement to mediate pursuant to paragraph 7, above, and following U.S. EPA's notification that it can share the expenses of mediation, the parties will be forwarded a list of mediators ("Mediation Selection List") available through the Dispute Resolution Support Services Contract managed by U.S. EPA.
 - (b) Within five (5) days of Respondent's receipt of the Mediator Selection List, the parties shall

simultaneously provide each other with a letter ("Mediation Nomination Letter") which shall contain the names of five (5) persons from the Mediator Selection List nominated to serve as mediators for the Mediated Matter in dispute.

(c) The mediators nominated by each party must not have any past, present, or planned future business relationships with the parties, other than for mediation activities. They must also agree to the terms and conditions for mediation contained in this Consent Order and enter into an agreement for the provision of alternative dispute resolution (ADR) services with the parties. All persons nominated shall be provided with a copy of the Consent Order by the nominating party. Any conflicts of interest or refusal to comply with paragraphs 13 and 14 of this section shall automatically result in rejection of said nominee.

(4) Within five (5) days of the receipt of the Mediation Nomination Letters, each party shall advise the other in writing of acceptable nominees. All acceptable nominees who are not automatically rejected pursuant to subparagraph (3) above shall comprise the Mediator Nomination List. The parties shall select a mediator from the Mediator Nomination List and enter into an agreement for mediation services with such mediator through negotiation and by mutual consent within twenty

(20) days of the receipt of the Mediation Nomination Letters.

Alternatively, the parties may select a mediator from any other source of mediators. In this event, the provisions of paragraph 10.(c) ., above, shall continue in effect.

11. The parties agree that the time period for mediation of the matter in dispute is limited to thirty (30) days from the date the parties sign an agreement with a Mediator. This time period may be extended by U.S. EPA.
12. If for any reason the parties are unable to select a mediator or are unable to complete mediation within the time periods for those activities specified in paragraphs 10 and 11 above, U.S. EPA's Dispute Decision shall be incorporated into and shall become an enforceable element of this Consent Order upon the conclusion of such time period, but will not be considered final agency action for purposes of judicial review.
13. Unless the parties agree otherwise in writing, the mediator's role shall be limited to facilitating negotiation between the parties. Mediation sessions shall not be recorded verbatim and no formal minutes or transcripts shall be maintained. Unless the parties agree otherwise, the mediator shall make no written findings or recommendations.
14. Meetings or conferences with the mediator shall be treated as confidential settlement negotiations. Statements made by any person during any such meetings or conferences shall be

deemed to have been made in compromise negotiations within the meaning of Rule 408 of the Federal Rules of Evidence and applicable State rules of evidence, and shall not be offered in evidence in any proceeding by any person. The mediator will be disqualified as a witness, consultant or expert in any pending or future action relating to the subject matter of the mediation, including those between persons not a party to the mediation. If Respondent fails to comply with the mediation confidentiality requirements of this section, then it will forfeit its rights, if any remain, under this Consent Order to request future mediation and may be responsible for stipulated penalties for such breach as provided in Section XVI (Delay in Performance/Stipulated Penalties).

15. Any agreement to resolve the dispute reached by the parties pursuant to this section shall be in writing and shall be signed by both parties. The written agreement shall specify which provisions of the U.S. EPA Dispute Decision are superseded and/or modified. If the written agreement is not signed by Respondent within seven (7) days after the resolution of the dispute, it shall be null and void and the U.S. EPA Dispute Decision shall be incorporated into and become an enforceable element of this Order, but will not be considered final agency action for purposes of judicial review.

XVIII. FORCE MAJEURE AND EXCUSABLE DELAY

1. Force majeure, for purposes of this Order, is defined as any event arising from causes not foreseen and beyond the control of Respondent or any person or entity controlled by Respondent, including but not limited to Respondent's contractors, that delays or prevents the timely performance of any obligation under this Order despite Respondent's best efforts to fulfill such obligation. The requirement that Respondent exercise "best efforts to fulfill such obligation" shall include, but not be limited to, best efforts to anticipate any potential force majeure event and address it before, during, and after its occurrence, such that any delay or prevention of performance is minimized to the greatest extent possible. Force majeure does not include increased costs of the work to be performed under this Order, financial inability to complete the work, work cessation or other labor disputes.
2. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a ~~force majeure~~ event, Respondent shall contact by telephone and communicate orally with U.S. EPA's Project Coordinator or, in his or her absence, the Project Coordinator's Section Chief or, in the event both of U.S. EPA's designated representatives are unavailable, the Chief of the Enforcement and Compliance Assurance Branch of the Waste Pesticides & Toxics Division, U.S. EPA Region 5,

within forty-eight (48) hours of when Respondent first knew or should have known that the event might cause a delay. If Respondent wishes to claim a force majeure event, then within five (5) days thereafter, Respondent shall provide to U.S. EPA in writing the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; all other obligations affected by the event, and what measures, if any, taken or to be taken to minimize the effect of the event on those obligations; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a force majeure event if it intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health or the environment. Respondent shall include with any notice all available documentation supporting its claim, if any, that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of force majeure for that event. Respondent shall be deemed to have notice of any circumstances of which its contractors had or should have had notice.

3. If U.S. EPA determines that the delay or anticipated delay is attributable to a force majeure event, the time for performance of such obligation under this Order that is

affected by the force majeure event will be extended by U.S. EPA for such time as U.S. EPA determines is necessary to complete such obligation. An extension of the time for performance of such obligation affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation, unless Respondent can demonstrate that more than one obligation was affected by the force majeure event. If U.S. EPA determines that the delay or anticipated delay has been or will be caused by a force majeure event, U.S. EPA will notify Respondent in writing of the length of the extension, if any, for performance of such obligations affected by the force majeure event.

4. If U.S. EPA disagrees with Respondent's assertion of a force majeure event, U.S. EPA will notify Respondent in writing and Respondent may elect to invoke the dispute resolution provision, and shall follow the time frames set forth in Section XVII: Dispute Resolution. In any such proceeding, Respondent shall have the burden of demonstrating by a preponderance of evidence that the delay or anticipated delay has been, or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondent complied with the requirements of this Section. If Respondent satisfies this burden, the time for performance of such obligation will be

extended by U.S. EPA for such time as is necessary to complete such obligation.

XIX. RESERVATION OF RIGHTS

1. U.S. EPA reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including without limitation the assessment of penalties under §3008(h)(2) of RCRA, 42 U.S.C. §6928(h)(2). This Order shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which U.S. EPA has under RCRA, CERCLA, or any other statutory, regulatory, or common law authority of the United States. Respondent reserves all constitutional and statutory rights not waived explicitly herein.
2. U.S. EPA reserves the right to disapprove of work performed by Respondent pursuant to this Order and to order that Respondent perform additional tasks.
3. U.S. EPA reserves the right to order or perform any portion of the work consented to herein or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. U.S. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, U.S. EPA reserves its right to seek reimbursement

from Respondent for costs incurred by the United States. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for the costs of any response actions taken or authorized by U.S. EPA.

4. If U.S. EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste or hazardous constituent(s), or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work ordered, U.S. EPA may order Respondent to stop further implementation of this Order for such period of time as U.S. EPA determines may be needed to abate any such release or threat and/or to undertake any action which U.S. EPA determines is necessary to abate such release or threat.
5. This Order is not intended to be nor shall it be construed to be a permit. Further, the parties acknowledge and agree that U.S. EPA's approval of the SOW or any final work plan does not constitute a warranty or representation that the SOW or work plans will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Order shall not relieve Respondent of its obligations to comply with RCRA or any other applicable local, State, or Federal laws and regulations.
6. Notwithstanding any other provision of this Order, no action or decision by U.S. EPA pursuant to this Order, including

parties shall negotiate a SOW(s) to be incorporated into this Order pursuant to the terms of this Section.

XXIV. TERMINATION AND SATISFACTION

The provisions of this Order shall be deemed satisfied upon Respondent's and U.S. EPA's execution of an "Acknowledgment of Termination and Agreement to Record Preservation and Reservation of Rights" (Acknowledgment). U.S. EPA will prepare the Acknowledgment for Respondent's signature. The Acknowledgment will specify that Respondent has demonstrated to the satisfaction of U.S. EPA that the terms of this Order, including any additional tasks determined by U.S. EPA to be required pursuant to this Order, have been satisfactorily completed. Respondent's execution of the Acknowledgment will affirm Respondent's continuing obligation (1) to preserve all records as required in Section XIV: Record Preservation and (2) to recognize U.S. EPA's reservation of rights as required in Section XIX: Reservation of Rights, after all other requirements of the Order are satisfied.

XXV. SURVIVABILITY/PERMIT INTEGRATION

Except as otherwise expressly provided in this section, this Order shall survive the issuance or denial of a RCRA permit for the Facility, and this Order shall continue in full force and effect after either the issuance or denial of such permit. Accordingly, Respondent shall continue to be liable for the performance of obligations under this Order notwithstanding the issuance or denial of such permit. If the Facility is issued a RCRA permit and that permit expressly incorporates all or a part

of the requirements of this Order, or expressly states that its requirements are intended to replace some or all of the requirements of this Order, Respondent may request a modification of this Order and shall, with U.S. EPA approval, be relieved of liability under this Order for those specific obligations.

XXVI. EFFECTIVE DATE

The effective date of this Order shall be the day U.S. EPA signed the Order.

IT IS SO AGREED:

BY: W. J. Lawrence 6/17/97
Date
DuPont Company

BY: _____ Date.
Joseph Boyle, Chief
Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency, Region 5

IT BEING SO AGREED, IT IS HEREBY ORDERED THIS _____ DAY
OF _____, 1997

BY: _____
Joseph Boyle, Chief
Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency, Region 5

Administrative Order
On Consent

U.S. EPA I.D. # IND 005 174 354