DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: **Hercules Incorporated Burlington Plant Site**
Facility Address: **Neck Road, Burlington Township, New Jersey 08016**
Facility EPA ID#: **NJD011136884**

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

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

Duration / Applicability of EI Determinations

EI determination status codes should remain in the Resource Conservation and Recovery Information System (RCRIS) national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The Hercules Burlington Plant is located on approximately 135 acres of land, roughly 1.5 miles northeast of Burlington, New Jersey. The area surrounding the site is largely industrial, with some residential and undeveloped areas. A former petroleum bulk storage facility and barge unloading operation is located south of the site, along with property owned by U.S. Pipe Company. Northeast of the site, Liquid

Carbonic Corporation operates a storage and transfer facility. A residential area is located east of the Hercules property, with approximately 20 houses situated along Neck Road, directly across the street from the site. The site is bounded by the Delaware River along the entire western edge of the property. The facility is fenced, access is restricted, and security officers routinely patrol the property.

Hercules Incorporated (Hercules) has owned the Burlington Plant site since 1945, with manufacturing operations ongoing between 1946 and 1993, when the facility was permanently shut down. Prior to Hercules' ownership, the site was used as farmland. Principal products manufactured at the plant included hard and liquid resins made from processed pine tree rosins and used by the food and cosmetic industries as fragrances, additives, coatings, and adhesives. Other products manufactured at the Hercules site included raw materials used for manufacturing polyester fabrics, an agricultural herbicide, and a detergent ingredient. The site was divided into former process areas, materials handling and storage areas, support areas, and waste disposal areas. Wastewater from plant operations was managed in the lagoon system and an on-site wastewater treatment plant (WWTP). Effluent from the WWTP was discharged to the Delaware River via an outfall permitted under the New Jersey Pollutant Discharge Elimination System (NJPDES). Approximately 55 percent of the property remained undeveloped.

In May 1992, Hercules signed an Administrative Consent Order (ACO) with the New Jersey Department of Environmental Protection (NJDEP), requiring the facility to conduct all appropriate remedial investigation and feasibility study efforts, as well as any necessary remedial actions. In a March 16, 1993, ACO Amendment, NJDEP indicated that completion of all requirements outlined in the 1992 ACO will also constitute satisfactory completion of applicable Industrial Site Recovery Act (ISRA) requirements. In accordance with the ACO, several phases of investigation have been conducted at the site to date. The initial Remedial Investigation (RI) was completed in 1994, and subsequent phases of investigation (Phase II, Phase IIIA, Phase IIIB, and the Phase III Addendum) were completed in 1996 and 1997. The Hercules Burlington Plant had been operating under interim status under the Resource Conservation and Recovery Act (RCRA), but all hazardous waste units (including a container storage area) have been certified clean closed and require no further action.

Following the completion of Phase IIIA activities, the NJDEP approved a variance request to delineate the site to non-residential standards. Contamination has been found in soil and sediment at the site, largely within the uppermost foot of soil, although some pockets of deeper soil contamination also exist. In addition, three isolated areas of volatile organic compounds (VOCs) have been identified in the near-surface groundwater unit. Data obtained during the RI are being used to develop and implement remedial actions for soil, sediment, the former wastewater treatment lagoons, and groundwater beneath the site. Specific remedial actions were identified in the Remedial Action Selection Report (RASR) from 1998, and the follow-on Remedial Action Work Plan (RAWP) was conditionally approved in March 2001. A Deed Notice indicating that the site has been remediated to restricted use criteria (e.g., New Jersey Non-Residential Direct Contact Soil Cleanup Criteria [NJ NRDCSCC]) will be prepared and filed once remedial activities are completed.

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

__X__ If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ If data are not available skip to #6 and enter IN (more information needed) status code

Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs): During the phased RI effort, Hercules identified 101 AOCs at the Burlington Plant site. Sixty-four of the 101 total AOCs have been determined to require no further action (NFA). The remaining 37 AOCs were retained for remedial action due to elevated contaminant concentrations in soils, sediments, the former wastewater treatment lagoons, and groundwater (Ref. 2). AOC descriptions are excerpted from the Phase III Remedial Investigation Report (Ref. 1). AOCs were subsequently combined into Operable Units (OUs) in the RASR for remediation purposes. As discussed in the facility description, a Deed Notice will be prepared to restrict future use of the property to non-residential use only; therefore, applicable soil standards are the NJ NRDCSCC. A brief description of the proposed remedial activities for each OU is presented at the end of this section. Refer to Plate 5 of the RAWP for a site plan indicating the OU locations, planned excavation depths, and soil reuse areas (Ref. 3).

AOC 1: Hard Resins Tank Farm. This AOC encompasses three storage tanks (Tanks 3025, 3082, and 3083) used to store hazardous substances, as well as other tanks used to store various non-hazardous resins, rosins, and raw materials. Tank 3025 was used for formaldehyde storage from 1947 to 1961 and for storage of hard resin products and ink oils in later years. Tank 3082 was used for ethylene glycol storage, while Tank 3083 was used for terpentine storage. Most of the tanks were located on an impervious concrete surface with a spill containment system, and Tank 3025 has an associated truck loading/unloading facility. Aroclor 1254 was detected in one surface soil sample above the NJ NRDCSCC. This AOC will become part of OU-2 P (Ref. 3).

AOC 5: Hercolyn® Tank Farm. Six aboveground storage tanks (ASTs) (F-4500, F-4100, T-4230, T-4503, T-4310, and T-4320) were located in this AOC. These tanks stored nonhazardous process materials and nonhazardous finished product. Resins were observed on the ground surface in the Hercolyn® Tank Farm, and methyldihydroabietate (Hercolyn®, a nonhazardous substance) was reportedly spilled in this AOC. No contaminants were detected above NJ NRDCSCC; however, AOC 5 was combined with adjacent AOCs 7, 8, and 9 into AOC 100 (Nickel Catalyst Area) for the purpose of delineating the extent of nickel contamination. Phase II investigation results and proposed remedial activities are discussed below in AOC 100.

AOC 6: Methanol Recovery Unit. This AOC is located in the Liquid Resins Area and encompasses methanol distillation equipment and four tanks (T-4950, T-4955, T-4960, T-4961) associated with the former Methanol Recovery Unit. These tanks contained methanol, glycol, and water. The unit was previously used to distill methanol for reuse. Toluene was detected in one subsurface soil sample exceeding NJ NRDCSCC. VOCs were detected in groundwater exceeding NJ Ground Water Quality Criteria (NJ GWQC). A portion of this AOC now comprises OU-2 Q (Ref. 3). Groundwater impacts in AOC 6 will be addressed as part of remedial activities at OU-4 (Ref. 3).

AOC 7: Catalyst Steam Cleaner. The Catalyst Steam Cleaner was used to prepare spent nickel catalyst for regeneration. The catalyst handling operations at this AOC occurred mostly on a concrete apron, but catalyst fines may have spilled onto the ground surface. Aroclor 1254, beryllium, and nickel were detected in surface soil exceeding NJ NRDCSCC. AOC 7 was combined with adjacent AOCs 5, 8, and 9 into AOC 100 (Nickel Catalyst Area). Phase II investigation results and proposed remedial activities are discussed below in AOC 100.

AOC 8: Catalyst House. The Catalyst House was used for the regeneration of nickel catalyst following steam cleaning at the Catalyst Steam Center. Nickel was detected in surface soil samples exceeding NJ NRDCSCC. AOC 8 was combined with adjacent AOCs 5, 7, and 9 into AOC 100 (Nickel Catalyst Area). Phase II investigation results and proposed remedial activities are discussed below in AOC 100.

AOC 9: Abitol® Building. Copper-chromite catalyst and Raney nickel catalyst were handled at the Abitol® Building. The suspected source of copper in the soils is the use and loading of copper-chromite catalyst in the Abitol® process. Spent catalyst was staged north of the Abitol® Building before disposal, and copper-chromite catalyst was not regenerated on site. Copper was detected in one surface soil sample exceeding NJ NRDCSCC. AOC 9 was combined with adjacent AOCs 5, 7, and 8 into AOC 100 (Nickel Catalyst Area). Phase II investigation results and proposed remedial activities are discussed below in AOC 100.

AOC 17: Former Fuel Oil Tank T-1103 Area. This AOC includes Former Tank T-1103, Tank T-1900, and the Dimethylterephthalate (DMT) C Plant Fuel Oil Unloading Station. Former Tank T-1103 is a former fuel oil tank with an estimated capacity of 10,000 gallons that has been removed. The tank was located in the DMT Area on concrete cradles (which are still in place) within a concrete block containment wall. There is stained gravel in the vicinity of the former tank. Tank T-1900, which contained paracymene, and the DMT C Plant Fuel Oil Unloading Station were both located in the area of former Tank T-1103. The unloading station was used to transfer fuel oil from tank trucks to T-1103. A Therminol® heat transfer system was located adjacent to T-1103. Aroclor 1254 was detected in surface soil exceeding NJ NRDCSCC. In addition, one surface soil sample contained seven percent bulk asbestos, which exceeds the guidance value of one percent developed for the site. NJ DEP approved the guidance value for asbestos as part of the Phase I Remedial Investigation Report. Portions of AOC 17 are now part of OU-2 H and OU-2 I.

AOC 23: DMT Paracymene Heater B. Paracymene Heater B, which burned fuel oil, was used to heat paracymene for use as a heat transfer agent in the DMT plant. Aroclor 1254 was detected in surface soil above NJ NRDCSCC. Most of AOC 23 is now part of OU-2 F (Ref. 3).

AOC 28: Henkel Plant. The Henkel Plant functioned as a pilot plant for the development of alternative methods for manufacturing DMT. A Dowtherm® Heater was also located in the Henkel Plant Area. Aroclor 1248 and Aroclor 1254 were detected in surface soil exceeding NJ NRDCSCC. For the Phase III investigation, AOC 28 and adjacent AOC 72 were combined to delineate the extent of PCB contamination. A portion of AOC 28 is now part of OU-2 N. However, the area surrounding Phase II Soil Boring 341, which recorded an Aroclor 1248 concentration of 230 mg/kg at 0 to 0.5 feet below ground surface (bgs), is included as OU-2 O (Ref. 3).

AOC 34: Unloading Station 9000. Unloading Station 9000 is located along the rail line and was used to transfer assorted solvents and petroleum products from railcars and tank trucks to storage tanks, as well as to load out resin products. Aroclor 1254 was detected in surface soil exceeding NJ NRDCSCC. The section of AOC 34 that is part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3).

AOC 39: Unloading Station 9008. Unloading Station 9008 was previously used to unload xylene, methanol, and petroleum products from rail cars and tank trucks. AOC 39 contains a single overhead rack and has no recorded discharges. Aroclor 1254 and beryllium were detected in surface soil exceeding NJ NRDCSCC. Aroclor 1254 was also detected in one subsurface soil sample from just above the water table exceeding NJ NRDCSCC. Part of AOC 39 will form OU-2 Y, and the portion of this AOC that comprises part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3).

AOC 44: DMT Rail Loading Station. This AOC is located in the vicinity of the DMT Warehouse. The DMT Rail Loading Station was used to load finished DMT product into rail cars. Aroclor 1254 was detected in surface soil exceeding NJ NRDCSCC. A section of AOC 44 will be included as part of OU-2 J (Ref. 3).

AOC 46: Tank T-1100-00. Tank T-1100-00 was used to store xylenes and petroleum hydrocarbons at different times. This tank was mounted on an earthen mound and had a sloping asphalt skirt extending outward. Tank T-1100-00 was removed in 1992. An area of stained soil measuring approximately 5 feet by 15 feet was noted on the northern edge of the asphalt skirt in the vicinity of an associated fuel pump during the site inspection. Benzo(a)pyrene was detected in surface soil exceeding NJ NRDCSCC. The inner portion of AOC 46 will be included as OU-2 AA (Ref. 3).

AOC 48: Tank T-7510-02. Tank T-7510-02 was used for fuel oil storage. This tank was mounted on a concrete pad and had a sloping asphalt skirt that extended outward. An earthen containment dike was present around Tank T-7510-02. This tank was removed in 1992. Oil staining measuring approximately 15 feet by 30 feet was noted on the northwest side of the tank during the site inspection. During Phase I investigations, Aroclor 1254 was detected in one surface soil sample exceeding NJ NRDCSCC. Phase II investigations of PCB contamination in AOC 48 were combined with that of AOC 49. Phase II results and remedial action plans are described below in AOC 49.

AOC 49: Tank T-7510-05. Tank T-7510-05 stored fuel oil, toluene, and xylene at different times in its operating history. This tank was mounted on a concrete pad and had a sloping asphalt skirt that extended away from the tank. An earthen containment dike was present around Tank T-7510-05. This tank was removed in 1992. During Phase I and Phase II investigations, Aroclor 1254 was detected in surface soil exceeding NJ NRDCSCC. Portions of AOCs 48 and 49 are included as OU-2 Z (Ref. 3).

<u>AOC 50: Tank T-7510-06</u>. Tank T-7510-06 was used for fuel storage from approximately 1968 to 1992. The tank was used to store a solution of toluene and feedstocks for Herban® manufacture (AC6868) from 1962 to 1968, and was converted to fuel oil storage following a toluene solution spill in 1968. Tank T-7510-06 was mounted on a concrete pad and had a sloping asphalt skirt that extended away from the tank. An earthen containment dike was present around the tank. The tank was removed from service and dismantled in 1992. Methylene chloride and toluene were detected in groundwater exceeding NJ GWQC. Groundwater impacts in AOC 50 will be addressed as part of OU-4 (Ref. 3).

<u>AOC 52: Tanks T-9971-01 and T-9971-02</u>. Tanks T-9971-01 and T-9971-02 previously stored methanol, ethylene glycol, and terpinene. These tanks are located within a common earthen containment area. Benzo(a)pyrene was detected in the same subsurface soil sample above NJ NRDCSCC. A portion of AOC 52 will be included as OU-2 T, and another segment as part of OU-2 U (Ref. 3). The section of AOC 52 that includes part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3).

<u>AOC 53: Tank T-7515</u>. Tank T-7515 is a 10,000 gallon tank that previously stored fuel oil and was removed in 1992. This tank was located within an earthen containment and had an associated transfer pump. Fuel oil had spilled on the gravel surrounding the transfer pump's containment area. As a result, gravel and soil in the area were removed and the area was backfilled with gravel. Aroclor 1254 was detected in a surface soil sample exceeding NJ NRDCSCC. Phase II soil investigations for AOC 53 were combined with those of AOC 64 and are described below under AOC 64, along with proposed remedial actions.

<u>AOC 55: Tank T-3071</u>. Tank T-3071 was used from approximately 1965 to 1992 for storage of a variety of fuel products, including xylenes and fuel oil. Tank T-3071 is currently located within a concrete containment area, but this containment structure was not always present. Aroclor 1254 was detected in one surface soil sample exceeding NJ NRDCSCC. AOC 55 was combined with AOC 56 for Phase II and Phase III investigations, and proposed remedial actions are described below under AOC 56.

<u>AOC 56: Tank T-3072</u>. Tank T-3072 was utilized for storage of mineral spirits and petroleum hydrocarbons from approximately 1949 until 1992. Tank T-3072 was located within a concrete containment area in the tank farm, but this containment structure was not always in place. Aroclor 1254 was detected in one surface soil sample exceeding NJ NRDCSCC. Portions of AOCs 55 and 56 will be addressed as part of OU-2 V (Ref. 3).

<u>AOC 60: Salvage Yard</u>. The Salvage Yard is a one-acre lot situated along the southern edge of the plant and was used to accumulate scrap metal and debris for recycling. Bulk asbestos was detected in surface soil at levels ranging from one to three percent, which exceeds the guidance value of one percent for the site. Insulation from dismantled piping that was stockpiled in the Salvage Yard is the probable source of asbestos contamination. The inner portion of AOC 60 where asbestos was detected is addressed as OU-2 BB (Ref. 3).

<u>AOC 63: Underground Storage Tank E-1</u>. Underground Storage Tank (UST) E-1 is located northwest of AOC 6 in the center of the site. This UST was used to store gasoline until its removal in 1991. Soil surrounding the unit had an odor resembling weathered gasoline, which suggested at least one historical discharge had occurred in the vicinity of Tank E-1. Approximately 300 cubic yards of soil were subsequently removed as a remedial action to reduce contaminant concentrations below the most stringent NJ soil cleanup criteria. Groundwater sampling detected metals and VOCs at concentrations exceeding GWQC. Benzo(a)pyrene was detected in a subsurface soil sample exceeding NJ NRDCSCC. A section of AOC 63 forms part of the Storm Water Drainage System and will be addressed as part of OU-1 A (Ref. 3). A portion of AOC 63 is also addressed as part of OU-2 K (Ref. 3). Shallow groundwater has been impacted by gasoline-related VOCs above NJ GWQC. Organic contamination in groundwater in AOC 63 will be addressed as part of OU-4 (Ref. 3).

AOC 64: Essential Materials Storage Pad. The Essential Materials Storage Pad is an asphalt pad in the southwestern part of the site, between Tank T-7515 (AOC 53) and Electrical Substation 8530 (AOC 70). This area was utilized for storage of metal drums of Dowtherm®, catalysts, fatty acids, nonyl phenol, and acrylic acid. No soil contamination was detected above NJ NRDCSCC, but a portion of the adjacent AOCs 53/64 will be included as OU-2 W to address Aroclor 1254 contamination discovered in Phase I investigations for AOC 53 (Ref. 3).

AOC 66: Boiler House Tank Farm. This AOC encompasses four ASTs, T-7500-1, T-7500-2, T-7500-3, and T-7520. Previous investigations at the Boiler House Tank Farm show the presence of hydrocarbons in samples collected from the 1.0 to 1.5 foot bgs interval, and concentrations decrease with depth. No soil contamination was detected above NJ NRDCSCC during Phase I investigations. A section of AOC 66 will be included as OU-2 M (Ref. 3).

AOC 68: Transformer Substation 8528. This AOC is located east of the DMT process area. Transformer Substation 8528 contains a concrete pad for mounting transformers, but the transformers have been removed. Aroclor 1254 in surface soil exceeded NJ NRDCSCC. A section of AOC 68 will be included as OU-2 C (Ref. 3).

AOC 69: Transformer Substation 8527. This AOC is located east of the DMT process area. Transformer substation 8527 contains a concrete pad for mounting transformers, but the transformers have been removed. Aroclor 1254 was detected in surface soil above NJ NRDCSCC. A portion of AOC 69 will be included as OU-2 E (Ref. 3).

AOC 72: Boiler House. The Boiler House is situated west of the fire protection water reservoir. Soil sampling and analysis conducted in the past indicated that PCBs are present in AOC 72. Aroclor 1254 and beryllium were detected in surface soil exceeding NJ NRDCSCC. The section of AOC 72 that is part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3).

AOC 77: Lagoon System. The lagoon system is comprised of six wastewater lagoons along the western boundary of the site that accepted process and sanitary wastes from the facility. A 60-mile high density polyethylene cover with heat-welded joints has been placed over Lagoons 1 - 4. Methylene chloride, toluene, total xylenes, and bis(2-ethylhexyl)phthalate were all detected in sludge exceeding NJ NRDCSCC. The lagoon sediments are not considered to be a source of contamination for groundwater or soil (Ref. 3). The lagoon system will be addressed as part of OU-3, with the South Pit (Ref. 3).

<u>AOC 81: Barren Area</u>. This AOC is characterized by resin-like waste material on the ground surface and a lack of vegetation. The waste material varies in thickness up to approximately 0.5 feet, and is underlain by sandy soil. Some test pits indicated staining up to approximately one foot bgs. Aroclor 1248 and Aroclor 1254 were detected in surface soil exceeding NJ NRDCSCC. The inner portion of AOC 81, which surrounds the sampling sites that detected most Aroclor 1248 and Aroclor 1254 exceedences, will be included as OU-2 B (Ref. 3).

<u>AOC 84: S-1 Area</u>. This AOC is located in the field north of the DMT Tank Farm. Beryllium was detected in a surface soil sample exceeding NJ NRDCSCC. AOC 84 was combined with AOC 90 for Phase II investigations and the results are described below under AOC 90. The portion of AOC 84 surrounding the beryllium detection will be included as OU-2 A (Ref. 3).

<u>AOC 85: Storm Water Drainage System</u>. The Storm Water Drainage System is composed of a series of swales and ditches that control storm water runoff at the site. Aroclor 1254 was detected in surface soil exceeding NJ NRDCSCC. The metals beryllium, lead, nickel, and zinc were detected in surface soil exceeding NJ NRDCSCC. AOC 85 will be addressed as part of OU-1A, the Storm Water Drainage System (Ref. 3).

<u>AOC 86: Aboveground Piping</u>. The site contains an extensive network of overhead piping used to distribute raw materials throughout the facility. Investigations of aboveground piping were conducted in areas of suspected releases, in conjunction with other AOCs at the site. Aroclor 1254 was detected in surface soil above NJ NRDCSCC during Phase I and Phase II investigations at AOCs 1, 3, and 23. After Phase I investigation activities were completed, a spill of No. 4 fuel oil was discovered near a non-operating aboveground pipe north of the Catalyst Steam Cleaner (AOC 7). Stained soils were removed in the spill area and post-excavation sampling in Phase III investigations detected Aroclor 1254 above NJ NRDCSCC. The area surrounding this fuel oil spill will be addressed as part of OU-2 R (Ref. 3). The area surrounding an Aroclor 1254 exceedence from AOC 23 will be remediated as part of OU-2 F (Ref. 3). Additionally, two of the remaining Aroclor 1254 exceedences from AOC 1 will be remediated as part of OU-2 P (Ref. 3).

<u>AOC 94: Cooling Towers</u>. Two cooling towers are located east of the DMT area and were used for cooling of non-contact cooling water. A potential source of asbestos-containing material (ACM) is insulation used at the Cooling Towers. Bulk asbestos was detected at a concentration of three percent in a surface soil sample, which exceeds the guidance value of one percent for the site. The section of AOC 94 surrounding this sample location is being addressed as OU-2 D (Ref. 3).

<u>AOC 97: Site-Wide Groundwater Monitoring</u>. This AOC addresses elevated levels of lead and arsenic in shallow groundwater beneath the Hercules property. Both total and dissolved concentrations have exceeded applicable NJ GWQC, but at relatively low concentrations. No soil sources for lead or arsenic were identified during the RI, and nearly all reported lead and arsenic concentrations in soil were detected below the NJ RDCSCC. The elevated arsenic and lead in shallow groundwater have been determined to be associated with natural background concentrations and/or historical use of the property for agricultural purposes. Total concentrations of other metals, including aluminum, chromium, and nickel were detected above NJ GWQC. Manganese exceeded NJ GWQC in both total and dissolved concentrations but is also present at background concentrations above NJ GWQC. Total concentrations of VOCs including benzene, ethylbenzene, methylene chloride, toluene, vinyl chloride, and xylenes were also detected above NJ GWQC. The only further action planned for this AOC is groundwater monitoring (Ref. 3).

AOC 99: Retention Basin. The Retention Basin, located in the southwest corner of the facility, receives storm water runoff from the Storm Water Drainage System. The Retention Basin utilizes inverted pipes to retain sediments and discharges to a drainage ditch. The drainage ditch is piped under River Road and discharges to the Delaware River. The Retention Basin holds sediment and is partially filled with water for most of the year. Nickel was detected in one sediment sample exceeding NJ NRDCSCC. Chromium was also detected in one surface soil sample above NJ NRDCSCC for the inhalation exposure pathway but below NJ NRDCSCC for human health impact. The section of AOC 99 that is part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3). The Retention Basin of AOC 99 will be included as OU-1 B (Ref. 3).

AOC 100: Nickel Catalyst Area. Four AOCs: AOC 5 (Hercolyn Tank Farm), AOC 7 (Catalyst Steam Cleaner), AOC 8 (Catalyst House), and AOC 9 (Abitol Building), were combined into AOC 100 to form the Nickel Catalyst Area. These AOCs were combined based on proximity, similarity of contaminants, and the nature of historical nickel catalyst handling procedures. Aroclor 1254 was detected in one surface soil sample above NJ NRDCSCC. Portions of AOC 100 will comprise segments of OU-2 L and OU-2 R (Ref. 3). The section of AOC 100 that is part of the Storm Water Drainage System will be addressed as part of OU-1 A (Ref. 3).

AOC 101: Circuit Breaker Station. The Circuit Breaker Station is located in the extreme southeastern portion of the facility, behind the office building. This station is no longer in use but previously contained dielectric fluid, which might have contained PCBs. This AOC was incorporated into the remedial investigation for the first time in Phase III. Aroclor 1254 was detected in a surface soil sample exceeding NJ NRDCSCC. The section of AOC 101 surrounding this sample location will be included as OU-2 CC (Ref. 3).

In summary, contamination has been delineated at all AOCs, and 37 AOCs described above require remedial action. As discussed in the RAWP, these AOCs will be combined into four OUs: OU-1 (Storm Water Drainage System sediments and soils), OU-2 (surface soils outside of the Storm Water Drainage System), OU-3 (lagoon sediments), and OU-4 (groundwater AOCs). OU-1 is further divided into OU-1 A and OU-1 B. OU-2 is further divided into OU-2 A through OU-2 Z, plus OU-2 AA, OU-2 BB, and OU-2 CC. Refer to Table 2 of the Final 100% Design Report for proposed excavation depths and post-excavation sampling for OU-1 and OU-2 (Ref. 6).

OU-1: OU-1 A contains part or all of AOCs 34, 39, 52, 63, 72, 85, 99, and 100. Sediments and soils in OU-1 A, located within and adjacent to the drainage swale, will be excavated to a depth of one foot bgs and stockpiled for use in the lagoon closure (Ref. 3). OU-1 B contains a portion of AOC 99. Sediments from AOC 99, the retention basin, will be excavated to two feet below the top of the sediment surface and stockpiled for use in the lagoon closure (Ref. 3).

OU-2: Planned remedial activities for OU-2 include excavation of impacted soil to the NJ NRDCSCC. The majority of soils will be stockpiled for reuse in the lagoon closure, while a small portion of soils with PCB concentrations greater than 100 mg/kg will be isolated and disposed of off site (Ref. 3). OU-2 soil excavation will be limited to the upper one-foot interval in most subareas; however, soils in OU-2 AA (AOC 46) will be excavated to two feet bgs, and soils in OU-2 Q (AOC 6) and OU-2 T (AOC 52) will be excavated to the water table (Ref. 3). Soils in OU-2 O (AOC 28) will be excavated to three feet bgs and disposed of off site as Toxic Substances Control Act waste. Based on the results of previous investigations, soils in OU-2 M (AOC 66) and OU-2 X will be excavated to one foot bgs and disposed of off site.

In the event of unforseen circumstances that complicate the excavation of OU-1 and/or OU-2 soils or sediments, the removal action for OU-1 and/or OU-2 may need to be supplemented or modified, subject to the prior approval of NJDEP, by a combination of engineering and institutional controls that allow remediation standards to be achieved through exposure control (Ref. 4).

OU-3: OU-3 consists of AOC 77, the Lagoon System, and AOC 79, the South Pit. Planned remedial action for the lagoon sediments includes closure in-place, groundwater monitoring, and possible stabilization in-place for some of the sediments. OU-1 and OU-2 soils may be utilized for this purpose, and they will also be used for filling and grading purposes to achieve the desired slopes in the closed lagoon system. The sediments will then be covered with a soil cap constructed with OU-1 and OU-2 soils and a synthetic liner. Long-term groundwater monitoring will be conducted at the lagoons.

OU-4: OU-4 contains the groundwater AOCs: AOCs 6, 53, and 60 (AOCs with VOC exceedences), and AOC 97 (site-wide arsenic and lead impact AOC). Monitored natural attenuation/ degradation is the selected remedy for AOCs 6, 53, and 60, where VOC concentrations were detected above NJ GWQC (Ref. 3). NJDEP approved the monitoring well locations with the condition that these wells must be sampled for eight consecutive quarters (Ref. 5). Institutional controls including a Classification Exception Area (CEA) and a Well Restriction Area will be established for portions of the Cape May aquifer that contain exceedences of the NJ GWQC for VOCs, lead, and/or arsenic (Ref. 3). The CEA boundary will be the Hercules property line (Ref. 3, Appendix D). Contingent remedial actions would be implemented based upon monitoring results and would likely consist of enhanced in-situ biodegradation (Ref. 3).

References:

1. Phase III Remedial Investigation Report. Prepared by Roux Associates, Inc. Dated June 19, 1997.
2. Remedial Action Selection Report. Prepared by Roux Associates, Inc. Dated November 20, 1998.
3. Remedial Action Workplan. Prepared by Roux Associates, Inc. Dated February 11, 2000.
4. Letter from John A. Lucey, Roux Associates, Inc., and Neil R. Rivers, Roux Associates, Inc., to John Doyon, NJDEP, re: Revised Remedial Action Workplan. Dated November 29, 2000.
5. Letter from John Doyon, NJDEP to Joseph Keller, Hercules, Inc., re: Hercules Burlington Facility, Neck Rd. Dated May 29, 2001.
6. Letter from Jennifer W. Polaski, Advanced GeoServices Corp., and Paul G. Stratman, Advanced GeoServices Corp., to John Doyon, NJDEP, re: Responses to Comments on Final (100%) Remedial Design. Dated June 17, 2003.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	x			Benzene, toluene, vinyl chloride, xylenes, arsenic, and lead
Air (indoors)[2]		x		
Surface Soil (e.g., <2 ft)	x			PCBs (Aroclor 1248, Aroclor 1254), metals (beryllium, copper, lead, nickel, zinc), VOCs (methylene chloride, toluene, xylenes), SVOCs (benzo(a)pyrene, bis(2-ethylhexyl)phthalate), asbestos
Surface Water		x		
Sediment	x			Nickel, chromium
Subsurface Soil (e.g., >2 ft)	x			Aroclor 1254, toluene, benzo(a)pyrene
Air (Outdoor)		x		

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

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

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

Rationale:

Groundwater

Groundwater at the Hercules site occurs as a shallow water table aquifer in the Cape May Formation and as deeper aquifers in sand layers of the Raritan Formation. The water table generally occurs at a depth

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, non-aqueous phase liquids (NAPL) and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

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

of 6 to 14 feet bgs. Flow in the water table aquifer is toward the west, eventually discharging into the Delaware River.

The uppermost portion of the Raritan Formation, directly beneath the Cape May Formation in the vicinity of the site, consists of a clay layer approximately 45 to 50 feet thick (Ref. 2). This unit acts as an aquitard, preventing direct hydraulic communication between the water table aquifer and deeper groundwater in the underlying sands of the Raritan Formation (Ref. 3). Groundwater movement in the Raritan Formation is influenced by pumping from high capacity supply wells in the region, but flow is generally to the south, away from the Delaware River.

During the phased RI effort, samples of both shallow and deep groundwater were collected at various locations across the Hercules site. Analytical results from these samples were compared to the NJ GWQC for Class II-A potable groundwater to identify and determine site-related impacts. Based on the resultant data, the deep aquifer has not been significantly impacted. However, shallow groundwater contains both organic and inorganic constituents of concern (COCs).

Several VOCs were reported above NJ GWQC in the shallow aquifer. These organic impacts are highly localized in the vicinity of AOCs 6, 50, and 63. Table 1 below presents a summary of organic exceedences from May 1996 (the most recent data for which source area data are available).

Table 1 - Organic Exceedences, May 1996 Sampling Event (µg/L)

AOC	Well	Constituent	NJ GWQC	May 1996 Concentration
6	MW-14	Benzene	1	11
		Toluene	1,000	9,600
		Vinyl Chloride	5	28
50	MW-10	Toluene	1,000	7,100
63	MW-8	Benzene	1	57
		Toluene	1,000	1,200
		Xylenes	1,000	1,400
	MW-13	Benzene	1	3

Source: Ref. 2, Table 2.

Shallow groundwater at the Hercules site has also been found to contain arsenic and lead above their NJ GWQC of 8 and 10 µg/L, respectively. Samples were collected and analyzed for these constituents as part of the Phase III investigation in May 1996 (arsenic) and October 1997 (lead). As summarized on Plate 4 of the RASR (Ref. 2), arsenic was detected in shallow groundwater up to 33 µg/L (total) and 17 µg/L (dissolved). Lead was reported up to 52 µg/L (total) and 13 µg/L (dissolved).

Air (Indoors)

The maximum concentrations of VOCs detected from the most recent groundwater sampling (1996), as shown in Table 1, were compared to the State of Connecticut Groundwater Standards for Protection of Indoor Air under the Industrial/Commercial (CT I/C VC) scenario to identify constituents that may be a concern due to potential migration into indoor air. Only vinyl chloride (maximum concentration of 28 μg/L in well MW-14) was detected above its corresponding CT I/C VC (2 μg/L) in AOC 6.

A limited groundwater investigation was conducted in the spring of 2000 to delineate the downgradient edge of contamination in each source area (Ref. 4). Seven temporary well points were installed and sampled at various distances stepping out from AOC 6 (MW-14) and the other groundwater AOCs. These sampling results did not detect vinyl chloride or any other VOCs in the vicinity of MW-14. Thus, vinyl chloride was detected in only one sample at the site in excess of the CT I/C VC. In addition, MW-14 is not situated directly beneath any buildings. However, according to available documentation, a structure is located approximately 50 feet cross-gradient from MW-14 (Ref. 3). Regardless of the presence of this structure, there are currently no activities taking place on site except for remedial activities, and the buildings on site are only being utilized to support remedial activities. Thus, given the minimal extent of VOC contamination and the lack of a routinely occupied building in the area of VOC impacts, VOC migration from groundwater into indoor air is not currently considered of concern at the site.

Surface/Subsurface Soil

Surface soil (< 2 feet bgs) and, to a lesser extent, subsurface soil (> 2 feet bgs), have been impacted at the site by PCBs, metals, VOCs, and SVOCs above the NJ NRDCSCC and/or site-specific endpoint criteria. Current use of the site and surrounding area is non-residential, and the planned Deed Notice will restrict the entire property to non-residential use (Ref. 5). Therefore, only the contaminants exceeding the NJ NRDCSCC or site-specific endpoint criteria are of concern for current site conditions. Current contaminant concentrations in soil have been grouped by OU, as future remedial activities at the site will be conducted on an OU basis.

> **OU-1 A:** The main soil contaminants in OU-1 A include PCBs, metals, and one SVOC. Exceedences of NJ NRDCSCC for Aroclor 1254 were detected in surface soil at AOC 85 (57.1 mg/kg, NJ NRDCSCC = 2.0 mg/kg), and in subsurface soil at AOC 39 (2.1 mg/kg, NJ NRDCSCC = 2.0 mg/kg). The following metals were detected above NJ NRDCSCC in surface soil at AOC 85: beryllium (27.0 mg/kg, NJ NRDCSCC = 2.0 mg/kg), lead (1,790 mg/kg, NJ NRDCSCC = 600 mg/kg), nickel (75,700 mg/kg, NJ NRDCSCC = 2,400 mg/kg), and zinc (3,300 mg/kg, NJ NRDCSCC = 1,500 mg/kg). Benzo(a)pyrene exceeded the NJ NRDCSCC in subsurface soil at AOC 63 (6.1 mg/kg, NJ NRDCSCC = 0.66 mg/kg).
>
> **OU-2:** Primary soil contaminants detected above NJ NRDCSCC in OU-2 include PCBs, metals, one SVOC, one VOC, and asbestos. The following PCBs were detected above NJ NRDCSCC (2.0 mg/kg) in surface soil: Aroclor 1248 in AOC 28 (230 mg/kg), and Aroclor 1254 in AOC 101 (87.4 mg/kg). The following metals were detected in surface soil exceeding NJ NRDCSCC: beryllium in AOC 84 (2.9 mg/kg, NJ NRDCSCC = 2.0 mg/kg), copper in AOC 9 (5,370 mg/kg, NJ NRDCSCC = 600 mg/kg), and nickel in AOC 7 (75,700 mg/kg, NJ NRDCSCC = 2,400 mg/kg). Toluene was detected in subsurface soil in AOC 6 above NJ NRDCSCC (4,800 mg/kg, NJ NRDCSCC = 1,000 mg/kg). Benzo(a)pyrene was detected in surface soil in AOC 46 exceeding NJ NRDCSCC (1.4 mg/kg, NJ NRDCSCC = 0.66 mg/kg). Asbestos was detected at

seven percent in one AOC 17 surface soil sample, which exceeds the Guidance Value of one percent for the site.

OU-3: Soil contaminants detected above NJ NRDCSCC in OU-3 include VOCs, one SVOC, and one metal. The SVOC bis(2-ethylhexyl)phthalate (730 mg/kg, NJ NRDCSCC = 210 mg/kg) and the following VOCs were detected at concentrations exceeding NJ NRDCSCC in sludge: methylene chloride (520 mg/kg, NJ NRDCSCC = 210 mg/kg), toluene (19,000 mg/kg, NJ NRDCSCC = 1,000 mg/kg), and total xylenes (1,400 mg/kg, NJ NRDCSCC = 1,000 mg/kg). Copper was also detected exceeding its NJ NRDCSCC (1,760 mg/kg, NJ NRDCSCC = 600 mg/kg). All sludge samples were taken from AOC 77, Lagoon System.

Surface Water/Sediment

The Delaware River is located west of the Hercules property, just across River Road from the Burlington Plant site. The river is the only surface water body in the site vicinity. Surface runoff occurs via a series of manmade storm water drainage ditches, which lead to a retention basin and discharge through the NJPDES permitted outfall. Shallow groundwater flows westward and discharges into the Delaware River in the vicinity of the site. The closest area of VOC-impacted groundwater beneath the Hercules property is located approximately 300 feet upgradient of the river in 1996. Wells downgradient of this area of contamination did not contain VOC contamination above NJ GWQC. Therefore, groundwater and surface water discharge to the Delaware River is not considered to be contaminated and thus, the Delaware River has not been impacted by site related activities.

Arsenic and lead have been historically detected in shallow groundwater above their respective NJ GWQC; however, these impacts have been determined to be associated with natural background. Regardless, surface water and sediment sampling was performed in 1997 to evaluate metal concentrations in the Delaware River for the Preliminary Ecological Evaluation Addendum (Ref. 1). Thallium was the only metal detected in the two surface water samples from the river, at the confluence of the outfall and the river (15.9J[3] µg/L), and approximately 100 feet downstream of the outfall (13.9J µg/L). These concentrations exceed the NJ Surface Water Quality Standards (SWQC) level of 1.7 µg/L; however, they are estimated concentrations and were only detected in the unfiltered samples. Additionally, a thallium exceedence was detected approximately 300 feet upstream of the outfall (15.0J µg/L unfiltered), as well as at a lower concentration in the retention basin (11.4J µg/L unfiltered). Thus, data indicate that thallium concentrations in the Delaware River represent background conditions.

Material within the Retention Basin (AOC 99), now part of OU-1 B, has also been classified as sediment and was sampled during the remedial investigations (Ref. 1). Nickel was detected in one sediment sample (2,820 mg/kg) exceeding NJ NRDCSCC (2,400 mg/kg). Chromium was also detected in one sediment sample (85.6 mg/kg) above NJ NRDCSCC for the inhalation exposure pathway (20 mg/kg) but below NJ NRDCSCC for human health impact (6,100 mg/kg).

Air (Outdoors)

[3] J indicates estimated concentration.

No assessment of impacts to outdoor air has been conducted at this property. However, limited migration of contaminants bound to airborne particulate matter is expected at this site given the limited extent of surface soil contamination. In addition, based on the depth to groundwater at the site, volatile emissions of VOCs from groundwater to outdoor air is not expected to be of concern due to the natural dispersion of contaminants once they reach the surface. Thus, the migration of particulates entrained on dust and/or volatile emissions are not expected to be significant exposure pathways of concern at the Hercules site.

References:

1. Preliminary Ecological Evaluation Addendum. Prepared by Roux Associates, Inc. Dated March 27, 1998.
2. Remedial Action Selection Report. Prepared by Roux Associates, Inc. Dated November 20, 1998.
3. Remedial Action Workplan. Prepared by Roux Associates, Inc. Dated February 11, 2000.
4. Letter from John A. Lucey, Roux Associates, Inc., and Neil R. Rivers, Roux Associates, Inc., to John Doyon, NJDEP, re: Geoprobe Sampling in AOCs 6, 50, and 63. Dated August 11, 2000.
5. Letter from John A. Lucey, Roux Associates, Inc., and Neil R. Rivers, Roux Associates, Inc., to John Doyon, NJDEP, re: Revised Remedial Action Workplan. Dated November 29, 2000.

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

Summary Exposure Pathway Evaluation Table

Potential ***Human Receptors*** *(Under Current Conditions)*

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[4]
Groundwater	No	No	–	Yes	–	–	–
Air (indoor)							
Surface Soil (e.g. < 2 ft)	No	No	–	Yes	No	No	–
Surface Water							
Sediment	No	No	–	Yes	No	No	–
Subsurface Soil (e.g., > 2 ft)	–	No	–	Yes	–	–	–
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media — Human Receptor combination (Pathway).

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

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

[4] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish)

Rationale:

Groundwater

Groundwater contamination associated with VOCs is limited to three areas within site boundaries: AOCs 6, 50, and 63 (see Question 2, Groundwater Table 1 for detected exceedences in the most recent sampling event). VOCs were not detected above their respective NJ GWQC in downgradient wells, indicating that there is no off-site migration (Ref. 2). Arsenic and lead were also detected in shallow groundwater above their respective NJ GWQC in AOC 97. Samples were collected and analyzed for these constituents as part of the Phase III investigation in May 1996 (arsenic) and October 1997 (lead). These impacts have been determined to be associated with natural background conditions and/or historical agricultural uses of the property, rather than being site-related impacts (Ref. 4). Nevertheless, to detect any possible changes in concentration over time that might necessitate reevaluation of these COCs, arsenic and lead will be included in the ongoing monitoring program for this site, as discussed in the response to Question 1. Thus, off-site exposure to site-related groundwater contamination is not currently a concern.

The site is currently inactive. The only activities occurring on site are remedial activities performed by skilled remedial workers, who will be classified as construction workers for the purposes of this EI determination. There are no production or potable wells that are currently in use at this site, thus there is not a concern for remedial workers to obtain potable water from on-site sources. However, there is the potential for remedial workers to come into contact with contaminated groundwater during shallow excavation/remedial activities, as shallow groundwater is located at a depth of approximately six to 14 feet bgs. Thus, direct contact with shallow groundwater is being considered a potentially complete exposure pathway for an on-site remedial worker.

Although off-site groundwater migration is not a concern, it should be noted that a well search conducted during the Phase I RI effort indicated that no water supply wells are present in the shallow Cape May Formation, either sidegradient or downgradient of the site (Ref. 2). The Burlington County government has also indicated that shallow groundwater resources in this area will not be developed within the next 25 years (Ref. 3). Although groundwater is withdrawn from the Raritan Formation for municipal purposes within 0.75 mile of the site (Ref. 1), this aquifer shows no negative water quality impacts.

Surface/Subsurface Soil

As presented in response to Question 2, there are several areas on site with contamination in surface/subsurface soil above NJ NRDCSCC. The main surface soil contaminants include PCBs, metals, SVOCs, VOCs, and asbestos. Subsurface soil contaminants detected above NJ NRDCSCC include Aroclor 1254, benzo(a)pyrene, and toluene.

Although the facility is currently closed, the only on-site activities being performed are remedial investigations and activities being performed by skilled remedial workers. Given that there is contamination in place in surface and subsurface soil above NJ NRDCSCC, the potential for direct exposure to impacted surface and subsurface soil is being considered a potentially complete exposure pathway for an on-site remedial worker at this time, classified as construction workers for the purpose of this EI determination.

The site is completely surrounded by a chain link fence which precludes other receptors (e.g., trespassers) to exposures from contamination in on-site areas.

Sediment

As presented in response to Question 2, the Retention Basin (AOC 99) contains metal contamination in sediment above NJ NRDCSCC.

As indicated in the surface/subsurface soil discussion above, the potential for direct exposure to impacted sediment is being considered a potentially complete exposure pathway for an on-site remedial worker at this time, but other receptors are precluded from exposure to sediment contamination by the presence of a chain link fence surrounding the site.

References:

1. Site Inspection Report for Hercules Inc. Prepared by USEPA. Dated August 29, 1989.
2. Remedial Action Selection Report. Prepared by Roux Associates, Inc. Dated November 20, 1998.
3. Remedial Action Workplan. Prepared by Roux Associates, Inc. Dated February 11, 2000.
4. Email memo from John Doyon, NJDEP, to Elizabeth Butler, USEPA, re: Status Update on the Hercules Incorporated Burlington Plant Site. Dated January 8, 2002.

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be significant[5] (i.e., potentially "unacceptable") because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks?

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

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

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Rationale:

Groundwater

As discussed in response to Question # 3, the potential for on-site remedial workers to come in direct contact with contaminated groundwater is being considered a potentially complete exposure pathway. However, any exposures that may occur for remedial workers to impacted groundwater are not expected to be significant. Remedial workers are assumed to wear personal protective equipment (PPE) and adhere to strict Occupational Health and Safety Association (OSHA) guidelines. Thus, exposures to contaminated groundwater for construction (e.g., remedial) workers conducting remedial activities is not expected to pose a significant risk.

Surface/Subsurface Soil

As discussed in response to Question # 3, the potential for on-site remedial workers to come in direct contact with contaminated surface and subsurface soil is being considered a potentially complete exposure pathway.

However, any exposures that may occur for on-site remedial workers to contact impacted soil at the site are not expected to be significant. Remedial workers are assumed to wear PPE and adhere to strict

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[5] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a Human Health Risk Assessment specialist with appropriate education, training, and experience.

OSHA guidelines. Thus, exposures to contaminated surface or subsurface soil on site for construction (e.g., remedial) workers conducting remedial activities is not expected to pose a significant risk.

Sediment

As discussed in response to Question 3, the potential for on-site remedial workers to come in direct contact with contaminated sediment is being considered a potentially complete exposure pathway.

However, any exposures that may occur for on-site remedial workers to impacted sediment at the site are not expected to be significant. Remedial workers are assumed to wear PPE and adhere to strict OSHA guidelines. Thus, exposures to contaminated sediment on site for construction (e.g., remedial) workers conducting remedial activities is not expected to pose a significant risk.

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

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

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

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

This question is not applicable. See response to Question # 4.

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

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Hercules Incorporated Burlington Plant Site, EPA ID# NJD01113688, located on Neck Road, Burlington Township, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

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

___ IN - More information is needed to make a determination.

Completed by:	______________________________ Amy Brezin Environmental Consultant Booz Allen Hamilton	Date:____________________
Reviewed by:	______________________________ Kathy Rogovin Senior Risk Assessor Booz Allen Hamilton	Date:____________________
Also Reviewed by:	______________________________ Sameh Abdellatif, RPM RCRA Programs Branch EPA Region 2	Date:____________________
	______________________________ Barry Tornick, Section Chief RCRA Programs Branch EPA Region 2	Date:____________________
Approved by:	Original signed by:______________ Adolph Everett, Acting Chief RCRA Programs Branch EPA Region 2	Date: August 25, 2003

Locations where references may be found:

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

Contact telephone and e-mail numbers: Sameh Abedellatif, EPA RPM
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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Attachments

The following attachment has been provided to support this EI determination.

Attachment 1 - Summary of Media Impacts Table

Attachment 1 - Summary of Media Impacts Table
Hercules Incorporated Burlington Plant Site

	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
OU-1	No	No	Yes	No	Yes	Yes	No	▸ Soils/sediments excavated and stockpiled for use in lagoon closure	PCBs, Metals, SVOCs
OU-2	No	No	Yes	No	No	Yes	No	▸ Soils excavated and stockpiled for use in lagoon closure ▸ Small portion of soils disposed of off-site	PCBs, Metals, VOCs, SVOCs, Asbestos
OU-3	No	No	Yes	No	No	No	No	▸ Closure in-place ▸ Groundwater monitoring ▸ Possible stabilization in-place for sediments ▸ Capped with soil and synthetic liner	Metals, VOCs, SVOCs
OU-4	Yes	No	No	No	No	No	No	▸ Monitored natural attenuation/ degradation[6] ▸ Establishment of a Classification Exception Area and Well Restriction Area[7]	Metals, VOCs

[6]For AOCs 6, 53, and 60 only.

[7]For portions of the Cape May aquifer that contain exceedences of the NJ GWQC for VOCs, lead and/or arsenic.