DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Facility Name: **Ausimont, USA Inc.**
Facility Address: **10 Leonards Lane, Thorofare, New Jersey, 08086**
Facility EPA ID#: **NJD980753875**

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

While Final remedies remain the long-term 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 are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action programs 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 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 Ausimont facility is located on approximately 243 flat-lying acres at the northwest corner of Crown Point Road (Route 44) and Leonards Lane in Thorofare, Gloucester County, New Jersey. The site is bordered by grassy areas, tidal marshes, and the Delaware River to the north, the Pennsylvania Reading Seashore Railroad to the south, and woodlands to the east and west. Numerous streams exist in the vicinity of the site that discharge to the Delaware River, including Little Mantua Creek and Main Ditch.

Pennwalt Corporation commenced operations at the site in 1970, manufacturing chlorinated fluorocarbon propellants and refrigerants until 1977 when the demand for these products declined. Between 1983 and 1985, Pennwalt constructed a new manufacturing facility to produce a polyvinylidene fluoride resin marketed under the trade name of "Kynar" and an associated hydrochlorofuorocarbon gas. Kynar is used as a noncorrosive durable coating on pipes, and computer and telephone wire conduits. Most of the industrial plastics and coating manufacturing operations occur in the southern portion of the site, encompassing eight buildings, various process and manufacturing areas, aboveground storage tanks, and overhead piping. The facility operated an on-site wastewater treatment plant and a Resource Conservation and Recovery Act (RCRA) permitted incinerator.

As a result of corporate reorganization at the end of 1989, Pennwalt Corporation became Elf Atochem North America, Inc. In October 1991, Elf Atochem sold the operation to Ausimont USA, Inc. Chlorofluorocarbons are still being manufactured at the site to date. Both Atochem and Ausimont used chlorinated solvents in the manufacturing process.

The site became subject to RCRA Corrective Action in April 1989 when Pennwalt Corporation received its final Part B Permit for operation of a hazardous waste incinerator. The facility also became subject to NJDEP's Environmental Cleanup Responsibility Act (ECRA) in 1989. Groundwater investigations are ongoing to date, and various remedial actions are being considered, including establishment of Groundwater Classification Exception Areas, implementation of a Monitored Natural Attenuation plan, and/or active groundwater treatment options.

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): A total of 16 solid waste management units (SWMUs) were identified in the June, 1989 Draft RCRA Facility Investigation (RFI), Task 1 Report, four of which (SWMUs 1 through 4) are active or permitted in accordance with the HSWA Permit. With the exception of the four permitted SWMUs, all SWMUs were investigated in the November, 1992 Draft RFI Phase I Report. Additionally, in June and July, 1990, 27 areas were targeted for investigation under ECRA. The following provides a brief description of each SWMU or ECRA area under investigation. Facility maps depicting the SWMUs and areas of investigation have been provided in Attachments 1 and 2.

SWMU 1, RCRA Regulated Incinerator System: The incinerator, permitted in 1989, burns wastes from the production of Kynar and Isotron. None of the waste streams are listed as hazardous waste, but are classified due to their reactivity, toxicity, and ignitability. The incinerator is designed to accept both liquid and gaseous wastes. Because the incinerator is regulated under a RCRA hazardous waste facility permit, this unit was not addressed in the November, 1992 Draft RFI.

SWMU 2, Container Storage Area: This SWMU consists of a bermed concrete pad located adjacent to and directly south of the incinerator unit. This pad is used for on-site storage of hazardous waste (e.g., waste oil, spent batteries, methylene chloride, lab waste, and methanol) and can store up to 200 drums. Wastes accumulated in this area are held for less than 90 days and therefore, the unit does not require permitting under RCRA. This unit was not identified in the RCRA Facility Assessment (RFA) as requiring further investigations with respect to the corrective action provisions of the 1984 Hazardous and Solid Waste Amendments (HSWA) permit.

SWMU 3, Inorganic Wastewater Treatment System/ SWMU 4, Organic Wastewater Treatment System: The inorganic wastewater treatment system is located immediately west of the incinerator. There are five inorganic waste streams that consist of the polymer plant collection sump, an equalization tank, and a neutralization tank. Materials used in the wastewater treatment include lime, liquid polymer, and hydrochloric acid. The organic wastewater treatment system is located in the north area of the developed site. Process wastewater from six process areas are treated and subsequently discharged to the Gloucester County Utilities Authority. Samples of the wastewater indicate the presence of five volatile organic compounds (VOCs) including carbon tetrachloride, chloroform, methylene chloride, tetrachloroethylene and trichlorofluoromethane. These units were not identified in the RFA as requiring further investigation with respect to the corrective action provisions of the HSWA permit.

SWMUs 5/6, Two Former Neutralization Pits and Inlet Sump: This unit was utilized from 1970-1977 during the initial operation of the facility. Process wastewaters from the production of Isotron 11 and Isotron 12 were discharged to the neutralization system (consisting of two neutralization pits) through the neutralization pit inlet sump. These wastewaters were characterized by variable pH, excessive quantities of fluoride and chlorides compounds, and other possible constituents including carbon tetrachloride, chlorinated fluorocarbons, and arsenic and antimony compounds. In 1984, the inlet sump and pits were demolished in place and backfilled. Soil samples indicated elevated levels of fluoride and antimony above NJ residential direct contact soil cleanup criteria (RDCSCC) but below non-residential criteria. Therefore, no further action is required at this area given its current use as an industrial property.

<u>SWMUs 7/8/9, Dredge Spoils Area (Two Former Settling Lagoons, Retention Pond, and Two Former Waste Piles)</u>: This area encompasses approximately 35.6 acres adjacent to the Delaware River. The two former settling lagoons received wastewater from the neutralization pits, with total capacity of 600,000 gallons. Solids, principally calcium fluoride, settled out and accumulated in the lagoons. The retention pond received process wastewater from the settling lagoons in addition to other effluent wastewater. Discharge from this pond to the Delaware River occurred via an outfall regulated by an NJ Pollutant Discharge Elimination System (NJPDES) permit. The two former waste piles held a variety of solid waste materials, including drums, packing materials, and other miscellaneous materials. In 1983, samples collected from the waste pile indicated that the material was primarily activated alumina, antimony, and other non-hazardous constituents. The contents were classified as non-hazardous and removed for off-site disposal. The settling lagoons were tested in 1984 and analytical results indicated that they did not pose a threat to local groundwater quality, so they were subsequently backfilled along with the retention pond. Soil samples indicated elevated levels of lead, beryllium, and arsenic above non-residential direct contact soil cleanup criteria (NRDCSCC). Additional soil and groundwater investigations were required by NJDEP (Reference No. 6). Ausimont recently submitted an addendum to the Remedial Investigation Report (October, 2000) in which they discuss the fact that lead exceeded the NRDCSCC in one sample location at a depth of 9-10 ft which would limit exposures. Thus, Ausimont requested to perform compliance averaging for beryllium which, when performed, is below the NRDCSCC. Finally, Ausimont proposed installing engineering controls since arsenic exceeds the NRDCSCC. This report has not yet been reviewed by NJDEP or USEPA (Reference No. 7).

<u>SWMUs 10/11, Kynar Polymer Release Area and Stormwater Drainage Ditch</u>: In 1986 NJDEP and NJ Department of Fish, Game and Wildlife inspected this area in response to a reported spill of Kynar resin. Soil samples were obtained and results indicated that the Kynar resin and soils were non-hazardous. All spilled material and impacted soils were excavated and disposed off site. No further action was recommended at this site.

<u>SWMU 12, Inactive Septic Tanks and Tile Field</u>: The septic tank/leach field system was utilized in the early 1970s prior to the hookup with Gloucester County Utilities Authority Treatment Plant. Reportedly only sanitary wastes were discharged to this system. However, it has not been determined if lab wastes were also discharged to the septic tanks. Results from soil sampling indicates that the septic tanks have not impacted the surrounding soils. No further action was recommended at this site.

<u>SWMU 13, Vegetation Area</u>: During the RFA site visit, an isolated patch of vegetation was observed on the bank of the Delaware River near the facility’s NJPDES outfall. Air monitoring indicated that soils in this area contained detectable concentrations of organic vapors other than methane. One soil sample was obtained and results indicated that the presence of semi-volatiles was not due to a release of contaminants from facility operations. No further action was recommended at this site.

Information regarding past activities which took place at each of the ECRA areas of investigation is extremely limited. In June/July 1990, sampling and excavation activities were performed at the site. Additional sampling and excavations occurred from March through May, 1991, and final cleanup, including the implementation of institutional controls, occurred in March, 1992.

Area 1A/1B, Chlorine/Isotron and Monomer Railroad Unloading Area: Stained soil and gravel were excavated at Area 1B and post-excavation soil samples indicated that all results were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

Area 1C, 100 and 200 Process Area: Antimony and cadmium were found to exceed the NJ RDCSCC but were more than an order of magnitude less than the corresponding proposed standard for non-residential soil. All other results were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

Area 2A, Hydrochloric Acid Rail Car Loading Area: Samples were collected to delineate total petroleum hydrocarbon (TPH) and metal contamination. All analytical results were below the approved soil cleanup levels and proposed standards for residential surface soil established in the cleanup plan approval letter dated January 21, 1992. Therefore, a no further action determination was rendered.

Area 2B, Propane Valves and Vaporizers: Stained soil and gravel were excavated and post-excavation soil samples indicated that all results were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

Area 2C, Drainage Ditch System: Mercury exceeded the approved soil cleanup level in the NJDEP Cleanup Plan Implementation Report (Reference No. 5). In addition, cadmium and antimony slightly exceeded their corresponding NJ RDCSCC. However, all other results for soil samples are below the NJ residential criteria Because these metals only slightly exceeded the NJ RDCSCC, a no further action determination was rendered.

Area 3A, Former Operations Area: Results of sampling demonstrated antimony levels in excess of NJ RDCSCC but below non-residential criteria. Therefore, no further action is required given the current use of the property.

Area 3B, Stain in 100 Process Area: Stained soil was excavated and one post-excavation sample was collected with results indicating that concentrations were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

Area 3C, HCL Contamination Lagoon: Two soil samples were collected and all results were below the approved cleanup levels presented in the NJDEP cleanup plan dated January 21, 1992 (as cited in Reference No. 5). Therefore, a no further action determination was rendered.

Area 4A, Former Underground Storage Tanks: Analytical results for soil samples indicated that all results were below the NJ RDCSCC. Soil cleanup levels for TPH and base-neutral (BN) compounds were not established in the January 21, 1992, NJDEP letter (as cited in Reference No. 6). Therefore, a no further action determination was rendered.

Area 4B, Former Underground Storage Tank: Approximately 90 cubic feet of discolored soil was excavated north, south, and west of the 100 and 200 Process Area containment structure.

Post-excavation sampling determined that concentrations are below the approved soil cleanup levels presented in the NJDEP cleanup plan dated January 21, 1992 (as cited in Reference No. 5). Therefore, a no further action determination was rendered.

Area 5A, Monomer Storage Tank Area - Compressor Pump Pad: Analytical results from soil samples collected in this area indicated that all results were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

Area 5B, Steam Blowdown Stain: A small volume of discolored soil was excavated. Post-excavation sampling did not detect any TPH or BN compounds. Therefore, a no further action determination was rendered.

Area 6A, Temporary Storage Area for Monomer Furnace Carbon: All metals were below the approved soil cleanup levels referenced in the cleanup plan approval letter issued by NJDEP dated January 21, 1992 (cited in Reference No. 5). Cadmium slightly exceeded the NJ RDCSCC but was two orders of magnitude below the NRDCSCC. Therefore, a no further action determination was rendered.

Area 6B, Di-Butyl Peroxide Pumps: Approximately 250 cubic feet of discolored soil was excavated to a depth of 2.5 feet below grade. With the exception of acetone in one sample, all VOC results in post-excavation sampling were below the approved cleanup level referenced by NJDEP in the cleanup plan approval letter dated January 21, 1992 (cited in Reference No. 5). Additionally, concrete containment was expanded to encompass the storage tank, both pumps and associated piping. This was performed in accordance with the cleanup plan. No further actions are required at this area.

Area 7A, Monomer Furnace Area: Nickel was detected in excess of NJ NRDCSCC. The top one foot of surface soil was removed and a concrete pad was installed as part of the cleanup plan. Given the implementation of institutional controls, NJDEP approved no further action for this area.

Area 7B, Water Pumps: Discolored soil was excavated from between the concrete foundations for the two water pumps. Post-excavation samples did not contain TPH or BN compounds at detectable concentrations. Therefore, a no further action determination was rendered.

Area 8A, Storm Water Discharge Area: Analytical results indicated that nickel exceeded the NJ RDCSCC, but all other results for metals, TPH, VOC and BN compounds were below the approved soil cleanup levels established in the January 21, 1992, cleanup plan approval letter (cited in Reference No. 5). Therefore, a no further action determination was rendered.

Area 8B, Utility Building: Poly-chlorinated biphenyls (PCBs) were detected in soil adjacent to the Utility Building sump. In 1992, approximately 1,100 tons of soil at depths ranging between 2.5 and 6 feet below original grade and less than 20 cubic yards of concrete sidewalk were removed from this area. All post-excavation sampling results were below the approved soil cleanup level of 5 mg/kg for PCBs, which was established by NJDEP in the cleanup plan approval letter dated January 21, 1992 (cited in Reference No. 5). A no further action determination was rendered for this area.

Area 9B, Loading Dock of Polymer Building: Less than 10 cubic feet of discolored soil was removed and one post-excavation sample was collected with results indicating that PCB concentrations were below the corresponding NJ RDCSCC. Therefore, a no further action determination was rendered.

<u>Area 10B, Oil Drum Storage Shed</u>: Approximately 850 cubic feet of discolored soil was excavated. Nine post-excavation soil samples were collected and all results indicated that concentrations were below the proposed standards. Therefore, a no further action determination was rendered.

<u>Area 11B, Ditch Stain</u>: Less than 10 cubic feet of discolored soil was excavated. During a site inspection conducted on June 28, 1990, NJDEP representatives indicated that post-excavation sampling was not warranted. Therefore, a no further action determination was rendered.

<u>Area 12B, Dirt Road Stain</u>: A small volume of discolored soil was removed and one post-excavation sample was collected with results indicating that concentrations were below the corresponding NJ RDCSCC. Therefore, a no further action determination was rendered.

<u>Area 13B, Compressor Blowdown Stain</u>: Discolored soil and gravel adjacent to a compressor blowdown on the utility building in the inorganic waste treatment area was excavated. One post-excavation sample was collected with results indicating that concentrations were below the corresponding NJ RDCSCC. Therefore, a no further action determination was rendered.

<u>Area 14B, Inorganic Wastewater Treatment Dumpster</u>: Discolored soil and gravel was excavated. Four post-excavation samples were collected and results were below the approved soil cleanup levels established for the facility by NJDEP in the cleanup plan approval letter dated January 21, 1992 (cited in Reference No. 5). Therefore, a no further action determination was rendered.

<u>Area 15B, Maintenance Shop Drum</u>: Discolored soil was excavated south of the maintenance shop at a location where an oil drum was formerly stored in a horizontal position. One post-excavation sample was collected with results indicated that concentrations were below the NJ RDCSCC. Therefore, a no further action determination was rendered.

<u>Area 16B, Roadway Staining by Incinerator</u>: A small volume of discolored soil was removed. One post-excavation sample was collected with results indicating that concentrations were below the corresponding NJ RDCSCC. Therefore, a no further action determination was rendered.

In summary, 20 out of the 27 ECRA sites were determined to warrant no further action in a letter from NJDEP dated March 5, 1991 (Reference No. 3, p. 2). Additional sampling was performed in 1991 to further delineate soils at the seven outstanding areas. In a letter dated January 21, 1992, NJDEP concurred that no further actions were required at four of the seven areas, with two of the four areas requiring institutional controls (cited in Reference No. 5, p. 2). The three remaining areas (1A, 3A, and 8B) required additional sampling and investigation and were determined to be no further action. Based on the results of the November, 1992 Draft RFI, it was concluded that all SWMUs, with the exception of SWMUs 5/6 and 7/8/9, required no further action. In addition, NJDEP required an investigation of the nature, extent and potential sources of VOCs that were detected in groundwater in the southern portion of the site. Results of the soil and groundwater investigations for those areas requiring additional investigations are outlined in the response to Question No. 2.

<u>References</u>:

(1) Notice of Issuance of a Final HSWA Permit from USEPA Region 2. March 23, 1989.
(2) RCRA Facility Investigation Task I, Description of Current Conditions, prepared by Fred C. Hart Associates, June, 1989.
(3) Letter from Dawn Pompeo, NJDEP, to Peter Sacripanti, Shearman and Sterling, RE: Pennwalt Corporation, dated March 5, 1991.
(4) RCRA Facility Investigation Task 5, Draft RFI Phase I Report, prepared by McLaren/Hart Environmental, dated February 28, 1992.
(5) Cleanup Plan Implementation Report for Elf Atochem North America. Prepared by McLaren/Hart Environmental Engineering Corp. November 6, 1992.
(6) Letter from Stephen Maybury, NJDEP, to Gary Shelby, Elf Atochem, RE: Pennwalt Corporation, dated March 17, 1994.
(7) Remedial Investigation Report Addendum Including AOC 3A, AOC 7A, SWMU 5/6 and Dredge Spoils Area, prepared by ENSR Corporation, October, 2000.

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			metals, VOCs
Air (indoors)[2]	X			VOCs
Surface Soil (e.g., <2 ft)	X			metals
Surface Water	X			metals
Sediment			X	potential metal contamination
Subsurface Soil (e.g., >2 ft)	X			metals
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

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

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

The Ausimont site is underlain by the Potomac-Raritan-Magothy (PRM) aquifer system, which is comprised of three distinct aquifer units separated by two silty/clayey confining units. The PRM aquifer system is confined at its base by the crystalline basement rock of the Wissahickon Formation. The site is largely located within the recharge area of the upper aquifer. Groundwater in the upper aquifer is typically encountered within 15 to 20 feet below the ground surface (Reference 2, p. 3-2). The upper aquifer is approximately 75 feet thick in the vicinity of the site, with an underlying confining bed approximately 50 feet thick (Reference No. 12, p. 2-1).

Because the Ausimont site is located adjacent to the Delaware River, tidal influences are of potential concern. In the vicinity of Gloucester County, the Delaware River has a strong tidal influence, with a tidal rise and fall of approximately 1.5 feet in a shallow groundwater monitoring well in the northern portion of the site adjacent to the river, and less than 0.5 feet in a shallow groundwater monitoring well in the southern portion of the site adjacent to the main plant area.

Groundwater flow in the shallow water table aquifer beneath the site is divided. The majority of flow is generally toward the south. Heavy groundwater withdrawal in the PRM aquifers from well fields in Camden, New Jersey has effectively reversed the natural shallow groundwater flow toward the Delaware River, with flow now moving south and away from the Delaware River (Reference No. 2, p. 3-3).

There are two areas of the site where groundwater contamination is present. These areas include the dredge spoils area and an area in the active portion of the facility known as the VOC area. Within the dredge spoils area at the north edge of the site, unconfined groundwater generally flows northerly and easterly toward the Delaware River.

Dredge Spoils Area

The dredge spoils area extends approximately 1,700 feet into the Delaware River, covering approximately 37 acres with an average thickness of six feet. Depth to groundwater within the dredge spoils area is approximately 12-14 feet below ground surface.

An area of metals contamination has been identified beneath a portion of the filled dredge spoils area at the north end of the site near the SWMU 7/8/9 cluster. Recent groundwater sampling results from February, 2000, which are presented in the October, 2000 Remedial Investigation Addendum (not yet approved by NJDEP or reviewed by USEPA), were compared to the higher of either the NJ Class IIA Ground Water Quality Criteria (GWQC) or the Practical Quantitation Level (PQL) for Class II-A potable groundwater. Constituents and their maximum detected concentrations in groundwater samples are provided below in Table 1.

Table 1 - Maximum Concentrations of Constituents Detected in Groundwater in the Dredge Spoils Area (ppb)

Constituent	NJ GWQC	Maximum Concentration
Antimony	20	111
Cadmium	4	106
Lead	10	33.1

(Reference No. 12)

Aluminum, iron and manganese also exceeded the NJ GWQC, but are not of primary concern because they are not on the Priority Pollutant List and are naturally occurring. Both dissolved iron and manganese are typically found in shallow groundwater in many areas of New Jersey's Coastal Plain, and aluminum is found in most clay minerals common to the Coastal Plain. It should be noted that historical sampling from April 1995, detected levels of arsenic (17.4 µg/L) that exceeded the NJ GWQC of 8.0 µg/L, however, February, 2000 sampling detected levels of arsenic below the NJ GWQC.

Additionally, although there had also been some initial concern regarding VOC contamination beneath the SWMU 7/8/9 cluster, this issue has since been resolved. Analytical results obtained during Phase II of the RFI indicated the presence of 1,1,1-trichloroethane (TCA), carbon tetrachloride, methylene chloride, and chloroform in groundwater in the wells surrounding SWMU 7/8/9 (Reference No. 7, p.3). However, after completion of several additional rounds of sampling and analysis in which VOCs were not detected above NJ GWQC, NJDEP issued a no further action decision for VOCs in groundwater beneath SWMU 7/8/9 and the dredge spoils area (Reference No. 9, p. 3).

VOC Area

An area of chlorinated volatile organic compounds (CVOCs) contamination has been identified in the southern portion of the facility where active manufacturing occurs. In this area, groundwater flow is generally towards the south-southeast with a shallow gradient (ranging from approximately 0.001 to 0.0017 ft/ft). Recent groundwater sampling results from February, 1999 and April, 2000 are presented in the October, 2000 Groundwater Remedial Investigation Report (Reference No. 13) which has yet to be approved by NJDEP or reviewed by USEPA. Sampling results indicate the presence of CVOCs above NJDEP's Class II-A GWQC. An analysis of CVOC concentrations in groundwater indicates that the area of impact is comprised of two co-mingled plumes: one containing carbon tetrachloride, chloroform and related organic compounds; and the second containing TCA, 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE) and tetrachloroethene (PCE).

Maximum detected concentrations in both the February, 1999 and April, 2000 sampling events are provided below in Table 2.

Table 2 - Maximum Concentration of Constituents Detected in Groundwater in the VOC Area (µg/L)

Contaminant	NJ GWQC	Maximum Concentration 2/99	Well with Maximum Detected Concentration 2/99	Maximum Concentration 4/00	Well with Maximum Detected Concentration 4/00
1,1-dichloroethane (1,1-DCA)	70	84.9	MW-1D	84.7	MW-1D
1,2-dichloroethane (1,2-DCA)	2	46.5	M/H6D	79.3	M/H6D
1,1-dichloroethene (1,1-DCE)	2	10,200	WCC6	3,680	WCC6
1,1,1-Trichloroethane (TCA)	30	4,590	WCC6	4,660	WCC6

Chloroform	6	30.9	MW-2	ND (13)	WCC6
Carbon Tetrachloride	2	387	MW-2	31	MW-2
Trichloroethene	1	3.0	M/H7D	ND (9.0)	WCC6
Tetrachloroethene (PCE)	1	ND (10)	WCC6	ND (10)	WCC6
cis-1,2-Dichloroethene	10	--	NA	ND (20)	WCC6

- - Not analyzed

Figures depicting wells in the VOC plume area and detected contaminant concentrations for both the December, 1999 and April, 2000 sampling events are shown in Attachments 3 through 6. Attachments 3 and 4 display the December, 1999 sampling results in the shallow and deep zone aquifers, respectively. Attachments 5 and 6 display the April, 2000 sampling results in the shallow and deep zone aquifers, respectively.

Results from the most recent rounds of sampling are generally consistent with the historical data. However, changes in relative quantities of specific contaminants of concern were observed in selected wells from previous groundwater sampling events in 1992, 1994, and 1995. A significant increase in the concentration of both 1,1-DCE and 1,1,1-TCA is evident in the assumed former source area. For example, since 1992, the concentration of 1,1,1-TCA increased from 3,600 µg/L to 4,590 µg/L, and 1,1-DCE increased from 170 µg/L to 10,200 µg/L. In general however, concentrations of total CVOCs in the most downgradient wells were slightly lower than previous sampling events.

Based on a review of chemical usage and storage records for the site, Ausimont has identified several potential VOC source areas, including the Former Operations Area, the Railroad Unloading Area, and the Process Control Building. However, soil samples collected in these areas in 1994 revealed no remaining VOCs above NJ RDCSCC. Furthermore, VOC concentrations in groundwater samples collected at that time from wells in these locations (and throughout the plumes) were significantly less than one percent of their solubilities (Reference No. 6, p. iii). Based on these findings, Ausimont contends that any past releases of VOCs in these areas have been completely flushed through the highly permeable unsaturated zone and are no longer serving as a source of VOCs in groundwater. In a letter to the facility dated June 9, 1995, NJDEP reserved judgement on this issue (Reference No. 4, p. 4).

Additionally, it is thought that the VOC plume may have migrated off site. However, off-site sampling has yet to occur as Ausimont is trying to gain access to sampling in potentially impacted off-site areas. Thus, investigations are ongoing to determine the leading edge of the plume and whether it has migrated off site.

Air (Indoors)

Groundwater contamination in the dredge spoils area consists of metals while groundwater contamination in the VOC area consists primarily of CVOCs. The maximum concentrations of VOCs detected from the most recent round of sampling (April, 2000) were compared to the State of Connecticut Groundwater Standards for Protection of Indoor Air under the Industrial/Commercial (I/C VC) scenario to identify constituents that may be a concern due to potential migration into indoor air. Table 3 displays the maximum detected concentration along with its respective I/C VC.

Table 3 - Maximum Concentrations Detected in Groundwater in the VOC Area Compared with the Re-Ordered CT State Residential Indoor Air Criteria (µg/L)

Contaminant	CT I/C VC	Maximum Concentration* April, 2000
1,1-dichloroethane (1,1-DCA)	50,000	84.7
1,2-dichloroethane (1,2-DCA)	90	79.3
1,1-dichloroethene (1,1-DCE)	6	**3,680**
1,1,1-Trichloroethane (TCA)	50,000	4,660
Chloroform	710	ND (13)
Carbon Tetrachloride	40	31
Trichloroethene	540	ND (9.0)
Tetrachloroethene (PCE)	3,820	ND (10)
cis-1,2-Dichloroethene	N/A	ND (20)

N/A Not Established
* **Bold** indicates an exceedence

Based upon the exceedence of 1,1-DCE, the Johnson-Ettinger Model was used to calculate the incremental risk value (IRV) associated with the potential migration of its volatilization into indoor air in the VOC area. The maximum detected concentration of 1,1-DCE was used to calculate a conservative risk estimate for this compound. Other site-specific input parameters used in the model include soil type, soil temperature in the region and the depth to groundwater. Conservative default values were used for those remaining parameters for which site-specific values were not readily available. In addition, industrial exposure assumptions (i.e., averaging time, exposure duration, exposure frequency) were used in the calculations due to the current industrial nature of the property.

Table 4 identifies the calculated IRV for 1,1-DCE based on the detected concentration in groundwater during the most recent sampling event.

Table 4 - Calculated Incremental Risk Values and Hazard Quotients

Constituent	Calculated Incremental Risk Value (IRV)
1,1-dichloroethene (1,1-DCE)	2.0E-04 (IRV)

The calculated IRV for 1,1-DCE is above USEPA's acceptable risk range of 1.0E-04 to1.0E-06. The maximum concentration of 1,1-DCE was detected in well WCC6, which is located near area 7A, the Monomer Furnace Area. In this area, the groundwater is shallow (less than 15 ft bgs) and there is permeable sand and silt. In addition, the nearest building may be less than 30 feet from well WCC6.

Based upon these estimates, volatilization of groundwater contaminants into indoor air may be of concern. See Attachment 7 for the Johnson-Ettinger Model results.

Surface/Subsurface Soil

The Ausimont site consists of fine sands and interbedded clays of the Cretaceous Potomac and Magothy Formations. The northern end of the property (outside of the main plant area) has been filled with silt, sand, and gravel from the Mantua Creek and the Delaware River at various times between 1911 and 1970 (Reference No. 13, p. 2-1).

Due to the current industrial use of the property, detected soil concentrations were compared to the NJ NRDCSCC. Constituents in soil exceeding the non-residential criteria exist at SWMU 7/8/9 and area 7A.

SWMU 7/8/9, Dredge Spoils Area

The following are the contaminants of concern in surface/subsurface soil in SWMU 7/8/9:

> Arsenic: Maximum detected concentration of 45.6 mg/kg. The NJ NRDCSCC is 20 mg/kg based on natural background concentrations. Arsenic concentrations generally decrease with depth, and were primarily detected above the NJ NRDCSCC value within the upper 8 feet of material. NJDEP states that developing an alternate non-residential soil cleanup criteria for arsenic would not be appropriate, because the criteria is based on background. In addition, NJDEP does not permit compliance averaging soil samples contaminated with arsenic. Thus, arsenic remains of concern in this area.

> Beryllium: Maximum detected concentration of 3.8 mg/kg. The NJ NRDCSCC value for beryllium was changed from 1 mg/kg to 2 mg/kg based on natural background concentrations. Beryllium concentrations exceeded the NJ NRDCSCC value in the 0-1 ft, 4-4.5 ft and 7-8 ft range. Ausimont, in a recently submitted Addendum to the Remedial Investigation Report (October, 2000) that has yet to be reviewed by NJDEP or USEPA, has requested a variance from compliance averaging of separate intervals which would allow for compliance averaging of the entire 0-1 ft interval, based on the homogeneity and widespread extent of the dredge fill deposits. Under this scenario, the average beryllium concentration is 1.96 mg/kg, which is below the NJ NRDCSCC. The remaining beryllium exceedences of the NJ NRDCSCC occurs in the 4-4.5 ft and 7-8 ft range.

> Lead: Maximum detected concentration of 1,170 mg/kg. The NJ NRDCSCC value for lead is 600 mg/kg. All lead concentrations are below 600 mg/kg with the exception of one sample at location at a depth of 9-10 ft. This detected concentration, when compliance averaged with other concentrations from this sampling interval, is 149.2 mg/kg, which is below the NJ NRDCSCC.

Area 7A, Monomer Furnace Area

Nickel was detected above the NJ NRDCSCC value, with a maximum detected concentration of 6800 mg/kg in the 0-0.5 ft depth range (NJ NRDCSCC value is 2400 mg/kg). NJDEP required the removal of the upper one foot of soil and the installation of a concrete slab. After excavation and the installation of a concrete pad, NJDEP in a February 10, 1993 letter, approved no further action for this area (cited in Reference No. 12).

Surface Water/Sediment

One surface water sample was obtained from the Delaware River and analyzed for total metals. Detected concentrations were evaluated in comparison to the NJ Surface Water Quality Criteria (SWQC) and the Federal Ambient Water Quality Criteria (AWQC) for human health and organisms. None of the detected constituents exceeded either criteria however, the following constituents had detection limits that exceeded at least one of their respective criteria: antimony, arsenic, beryllium, mercury and thallium. Given that there was only one surface water sample obtained from the Delaware River, and given that the sample location is unknown, sample results of the most downgradient monitoring points in the dredge spoils area near the Delaware River were also evaluated in comparison to the NJ SWQC and AWQC. Manganese, cadmium and antimony were shown to exceed at least one of their respective criteria, and only manganese and cadmium were shown to exceed 10 times the NJ SWQC. Although no sediment samples were obtained from either the dredge spoils area or the Delaware River, it can be assumed that the constituents in sediment would be similar to those detected in surface water and groundwater.

Air (Outdoors)

Given the nature (i.e., metals) and limited aerial extent of surface soil contamination at the Ausimont site, it is unlikely that outdoor air would be adversely impacted by contaminants entrained to soil particulates in air. Based upon the JE Model results, 1,1-DCE is present in groundwater at levels that may pose risk to on-site receptors exposed to indoor air. However, it is unlikely that this highly volatile constituent would adversely impact outdoor air given its volatile nature and the natural mixing which occurs during normal air flow at the site.

References:

(1) Phase IA Soil Contaminant Characterization Report, prepared by McLaren/Hart, July, 1991.
(2) Summary Report on the Limited Hydrogeological Investigation at Ausimont USA, Inc., prepared by Hale and Dorr, February, 1993.
(3) Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atohem, Re: Pennwalt/Atochem, dated March 17, 1994.
(4) Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atochem, Re: Pennwalt/Atochem, dated June 9, 1995.
(5) Interim Report. Completion of RFI-Related Activities at SWMU 5/6 and SWMU 7/8/9, McLaren/Hart Environmental, September, 1995.
(6) Report No. 2 of Groundwater and Soil Investigations at the Elf Atochem Former Thorofare, New Jersey Facility, prepared by McLaren/Hart Environmental Engineering Corporation, dated March 29, 1996.
(7) Letter from Raymond Basso, EPA, to John Graham, NJDEP, Re: Groundwater and Soil Investigation Report #2, dated October 29, 1996.
(8) Letter from Gary Shelby and Virginia Hubert, Elf Atochem, to Rosemary Lafferty, NJDEP, dated March 4, 1997.
(9) Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, dated August 1, 1997.
(10) Ausimont Work Plan No. 3, dated December 15, 1997.
(11) Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, dated August 5, 1998.

(12) Remedial Investigation Report Addendum Including AOC 3A, AOC 7A, SWMU 5/6 and Dredge Spoils Area, prepared by ENSR Corporation, October, 2000.

(13) Groundwater Remedial Investigation Report: VOC Area, prepared by ENSR Corporation, October, 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[3]
Groundwater	No	No	No	No	--	--	No
Air (indoor)	No	Yes	No	No	--	--	--
Surface Soil (e.g. < 2 ft)	No	Yes	No	Yes	Yes	No	No
Surface Water	No	No	--	No	Yes	Yes	No
Sediment	No	No	--	No	Yes	Yes	No
Subsurface Soil (e.g., > 2 ft)	--	--	--	Yes	--	--	No
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

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

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

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) 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

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

<u>Rationale</u>:

Groundwater

Groundwater is not used at the site as potable water, and surrounding residents use municipally supplied drinking water from local surface water resources in which the water originates from deep regional aquifers. Thus, groundwater does not represent a complete exposure pathway. The two areas at the site where groundwater contamination is known are the dredge spoils area and the VOC plume area.

Dredge Spoils Area

Groundwater in the dredge spoils area flows towards the Delaware River and away from residential areas. While exposure to contaminants in groundwater in this area are unlikely, Ausimont proposes, in the October, 2000 Addendum to the Remedial Investigation Report, to establish a groundwater Classification Exception Area (CEA) for the shallow aquifer in the immediate area of the dredge spoils pursuant to the requirements of the N.J.A.C. 7:9-6 (Reference No. 2, pp. 5-2 and 5-3). The CEA would encompass the entire dredge spoils area, bounded to the northwest and northeast by the Delaware River, extending to the former shoreline to the southeast and the property boundary on the southwest. The CEA would apply to those metals in the shallow groundwater which currently exceed GWQC, including aluminum, antimony, cadmium, iron, lead, and manganese. The longevity of the proposed CEA would be indeterminate based on the inability of metals to naturally attenuate. Furthermore, Ausimont recommends that all groundwater monitoring wells in the dredge spoils area be abandoned upon development and approval of the proposed CEA, with no ongoing monitoring program. NJDEP has yet to comment on the completeness of available data for the dredge spoils area and the soundness of this CEA proposal. The implementation of a CEA would further reduce the current and future potential exposures to contaminated groundwater in this area.

VOC Plume Area

Since groundwater is not used at the site as potable water, there is no potential for human exposures to VOCs in groundwater through consumption of potable water. In addition, surrounding residents use municipally supplied drinking water. However, as part of the groundwater investigation for the VOC area, a municipal well search was conducted and six residential wells were identified approximately one-half mile downgradient of the site. Five of the wells were found through a review of municipal water billing records; four of the wells were sampled and analyzed for VOC contamination in late 1996 (the fifth residence was vacant). None of the analyzed wells exceeded applicable drinking water standards (Reference No. 4, p. 4 and Reference No. 5, p. 10). These findings are consistent with results of the groundwater flow and transport model presented in Report No. 2 for Groundwater and Soil Investigation (Reference No. 2) which predicted that CVOCs in groundwater beneath the Ausimont site do not extend off site as far as the residential wells. Specifically, the model found that CVOCs would naturally attenuate within 1000 feet of the downgradient edge of the property (Reference No. 2, p. 40). A sixth residential well was identified downgradient of the Ausimont site and is owned by Mr. Donald Pike at 113 First Avenue; to date, the usage, status of, and groundwater quality in this well has not been determined (Reference No. 1, p. 6). However, groundwater modeling results support the conclusion that any off-site migration will not impact groundwater in downgradient residential wells.

VOCs in groundwater also have the potential to discharge into the drainage ditch located in the southeast corner of the site. However, institutional controls such as the fence surrounding the site and guard surveillance, limit any potential exposures of groundwater seeps from trespassers. On-site workers could potentially be exposed to groundwater seepage if they work in the area of the drainage ditch. However, groundwater modeling of two contaminants (chloroform and carbon tetrachloride) that have the greatest potential to be released into the drainage ditch was performed for this area and results indicated that both VOCs are expected to be present in the groundwater seeps below their respective GWQC in the vicinity of the drainage ditch (Reference No. 2, p. 39).

Indoor Air

Under current conditions, there is the potential for contaminants (1,1-DCE) to volatilize from groundwater into on-site industrial buildings based on the results of the Johnson-Ettinger model. Thus, with the information currently available, on-site workers could potentially be exposed to elevated levels of VOCs in on site buildings.

Surface/Subsurface Soil

Area 7A

Nickel is the only constituent which exceeds the NJ NRDCSCC at area 7A. Institutional controls including the installation of a cement pad and soil excavation were performed to preclude potential exposures for on-site or construction workers in this area. Thus, with the installation of the cement pad, there is no potential for exposure to contaminated soil in this area.

SWMU 7/8/9

Contaminants in soil at SWMU 7/8/9, including arsenic, beryllium, and lead, exceed NJ NRDCSCC. Thus, it is possible for on-site workers to be exposed to concentrations in excess of non-residential criteria. Since this area is not in the active, manufacturing portion of the property, it is unlikely that an on-site worker or construction worker would perform any soil intensive activities in this area. Additionally, contaminants such as lead were detected in one subsurface soil sample at a depth of 9-10 ft below ground surface, and beryllium concentrations in excess of non-residential criteria were detected at a depth of 4 ft below ground surface. Thus, considering the minimal potential for activity in this area and the depth of contamination, it is unlikely that significant exposures would occur to potential receptors. The Ausimont site is located in an industrial area, is fenced, and maintains an on-site security system such that trespassing is highly unlikely. Thus, trespasser exposure to contaminants at SWMU 7/8/9 in the dredge spoils area is unlikely.

Surface Water/Sediment

Due to the lack of relevant surface water and sediment data, groundwater samples collected from monitoring wells adjacent to the Delaware River were evaluated. Based on this evaluation, several constituents may be present in surface water and sediment in the Delaware River. Thus, the potential for trespasser and recreator exposure to contaminated surface water and sediment in the Delaware River is being considered a potentially complete exposure pathway.

Reference(s):

(1) Letter from Steve Maybury, NJDEP, to Gary Shelby, Elf Atochem, Re: Pennwalt/Atochem, dated June 9, 1995.

(2) Report No. 2 of Groundwater and Soil Investigations at the Elf Atochem Former Thorofare, New Jersey Facility, prepared by McLaren/Hart Environmental Engineering Corporation, dated March 29, 1996.

(3) Letter from Gary Shelby and Virginia Hubert, Elf Atochem, to Ms. Rosemary Lafferty, NJDEP, dated March 4, 1997.

(4) Letter from John Graham, NJDEP, to Virginia Hubert, Ausimont, Re: Pennwalt/Atochem, dated August 1, 1997.

(5) Work Plan No. 3 for Groundwater Investigations and Development of Alternate Soil Cleanup Criteria, prepared by McLaren/Hart, Inc., dated November 25, 1997.

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

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

__X__ 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:

Indoor Air

Detected concentrations of 1,1-DCE in the groundwater in the vicinity of the VOC plume were evaluated using the Johnson-Ettinger model. The model results demonstrate that the incremental risk value was slightly above USEPA’s acceptable risk range of 1.0E-04 to 1.0E-06. It should be noted that conservative estimates were used when performing the Johnson-Ettinger analysis and only one constituent is of concern. However, based upon the information available, results indicate that exposure to contaminants in indoor air could reasonably be expected to be significant.

Soil/Sediment

SWMU 7/8/9

Ausimont has proposed to implement engineering controls, including the posting of signs and existing fencing and site security practices to restrict access to this area. This would restrict

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[4] 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.

exposures to both on-site workers, construction workers, and potential trespassers. With restricted access to this area, the complete exposure pathways are controlled.

Surface Water/Sediment

There is limited data on contamination in surface water and sediment in the adjacent Delaware River. One surface water sample obtained from an undetermined location in the Delaware River did not show any constituent with a detected concentration in exceedence of either the NJ SWQC or AWQC. Although groundwater adjacent to the Delaware River may exceed applicable standards for inorganics, the current extent of this impact is unclear. While at this time it is unknown whether the groundwater and soil contamination in the dredge spoils area is contributing to the degradation of surface water quality in the Delaware River, it is conservative to assume that there may be the potential for trespassers and recreationists to be exposed to site-related contamination via the Delaware River. However, the Delaware River in the area of the facility is highly industrial and not an attractive area, or easily accessible area, for trespassers or recreationists. Thus, trespassing in this area is unlikely and it does not appear that exposures can be expected to be significant. Additionally, the inorganic analytes detected in surface water and those detected in the downgradient wells adjacent to the Delaware River are typically found in shallow groundwater in many areas of New Jersey’s Coastal Plain and are therefore not considered to be hazardous constituents.

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).

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

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

Rationale:

Indoor Air

Inhalation of indoor air, given the concentrations of 1,1-DCE detected in groundwater in the VOC plume area, has the potential to result in a significant risk to human health. At this time, without additional site-specific information such as specifications of the nearest building (e.g., size, use, ventilation system information) or OSHA indoor air monitoring information, this pathway cannot be demonstrated to be within acceptable limits.

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

______ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Ausimont USA, Inc. Facility, EPA ID#NJD980753875, located at 10 Leonards Lane, Thorofare, 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.

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

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

Completed by: ______________________________ Date: ____________________
Kathy Rogovin
Risk Assessor
Booz·Allen & Hamilton

Reviewed by: ______________________________ Date: ____________________
Kristin McKenney
Risk Assessor
Booz·Allen & Hamilton

Also Reviewed by: ______________________________ Date: ____________________
Cliff Ng, RPM
RCRA Programs Branch
EPA Region 2

______________________________ Date: ____________________
Barry Tornick, Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: Original signed by: Date: June 30, 2003
Raymond Basso, Chief
RCRA Programs Branch
EPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 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: Clifford Ng, EPA RPM
(212) 637-4113
Ng.clifford@epamail.epa.gov

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

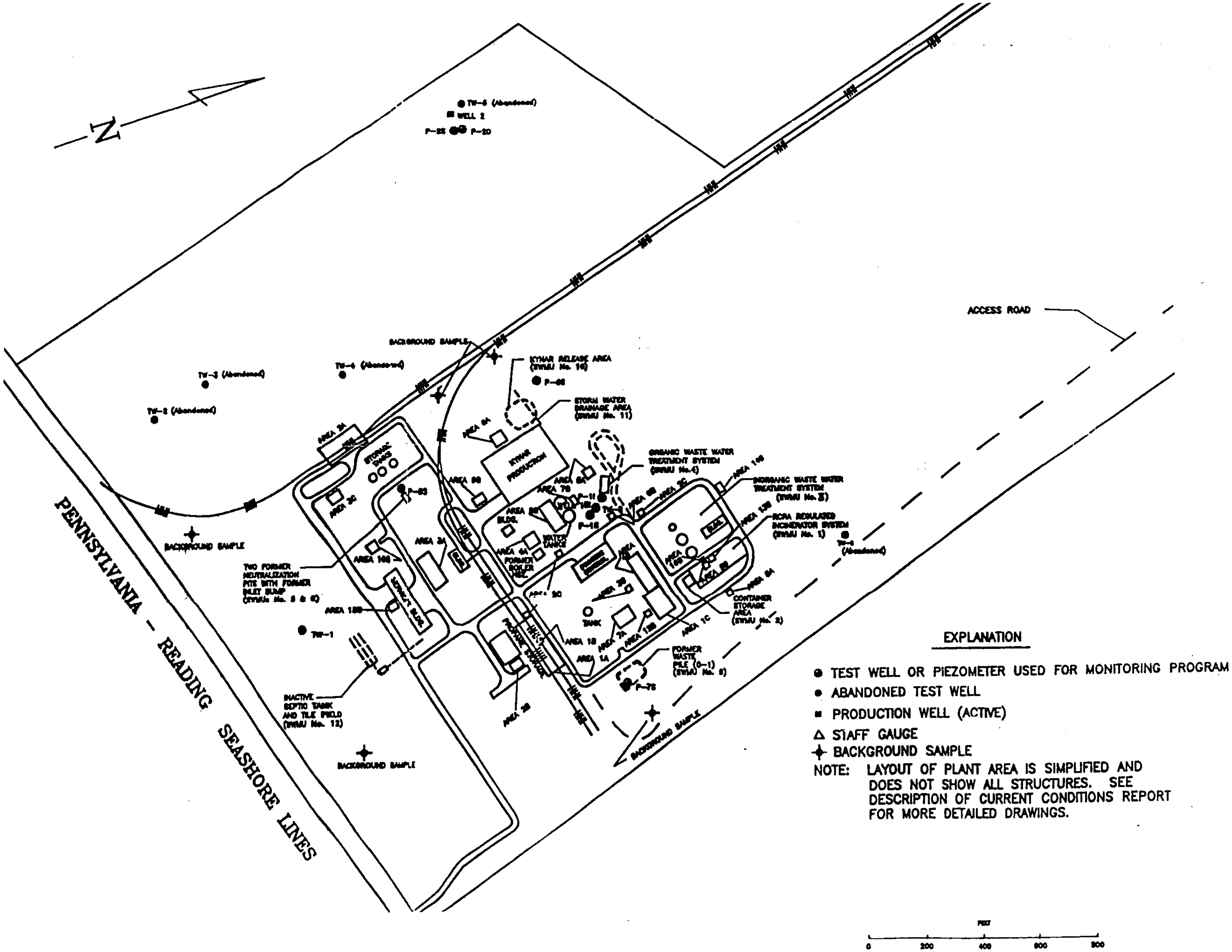
Attachments

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

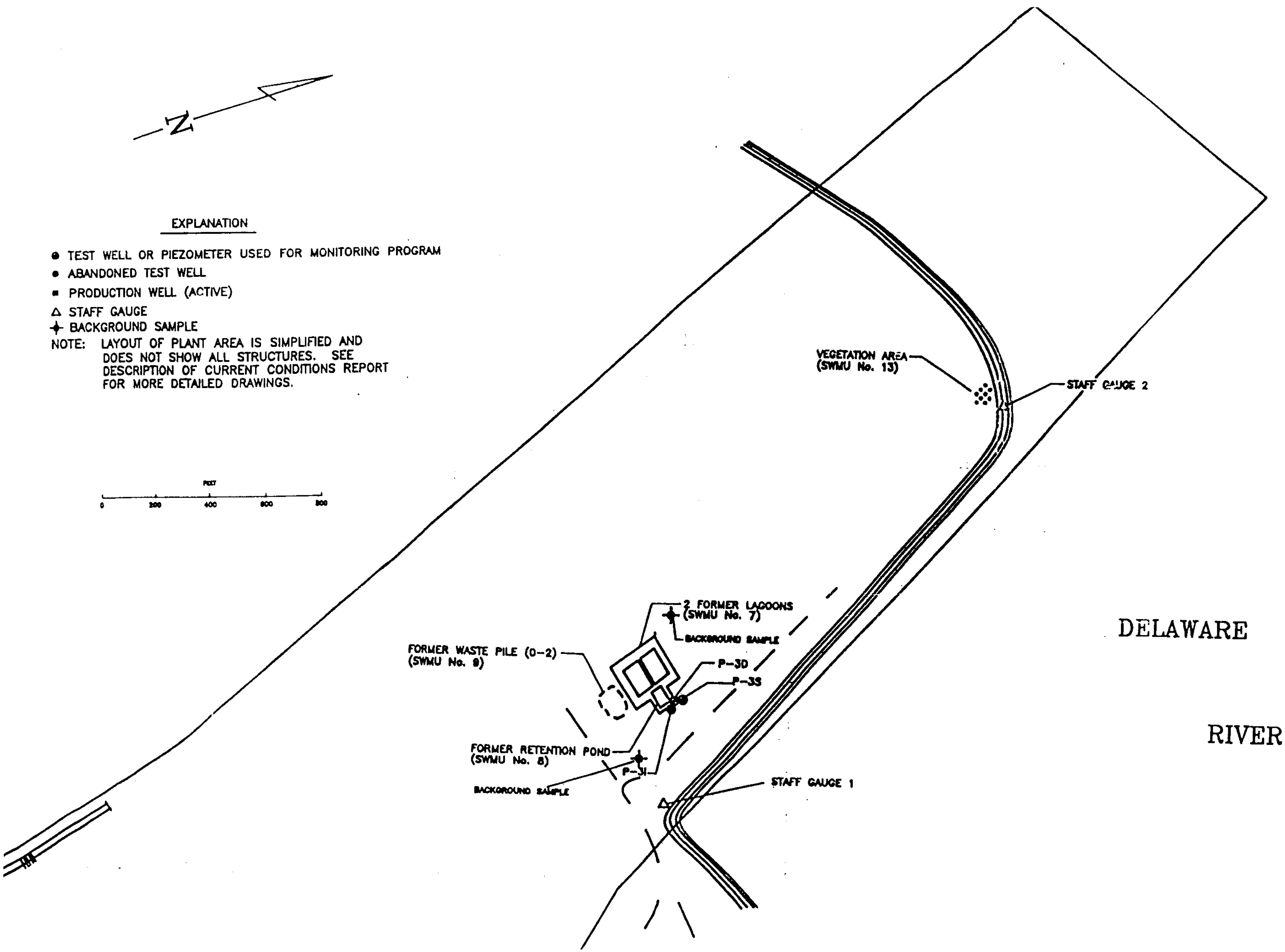
- Attachment 1 - SWMU/AOC Map - Main Plant Area in Southern Portion of Site
- Attachment 2 - SWMU/AOC Map - Dredge Spoils Area in Northern Portion of Site
- Attachment 3 - December, 1999 Groundwater Sampling Results for the Shallow Zone Aquifer
- Attachment 4 - December, 1999 Groundwater Sampling Results for the Deep Zone Aquifer
- Attachment 5 - April, 2000 Groundwater Sampling Results for the Shallow Zone Aquifer
- Attachment 6 - April, 2000 Groundwater Sampling Results for the Deep Zone Aquifer
- Attachment 7 - Johnson-Ettinger Model Results
- Attachment 8 - Summary of Media Impacts Table

Attachment 1 - SWMU/AOC Map - Main Plant Area in Southern Portion of Site

Source: Remedial Investigation Report Addendum, October, 2000

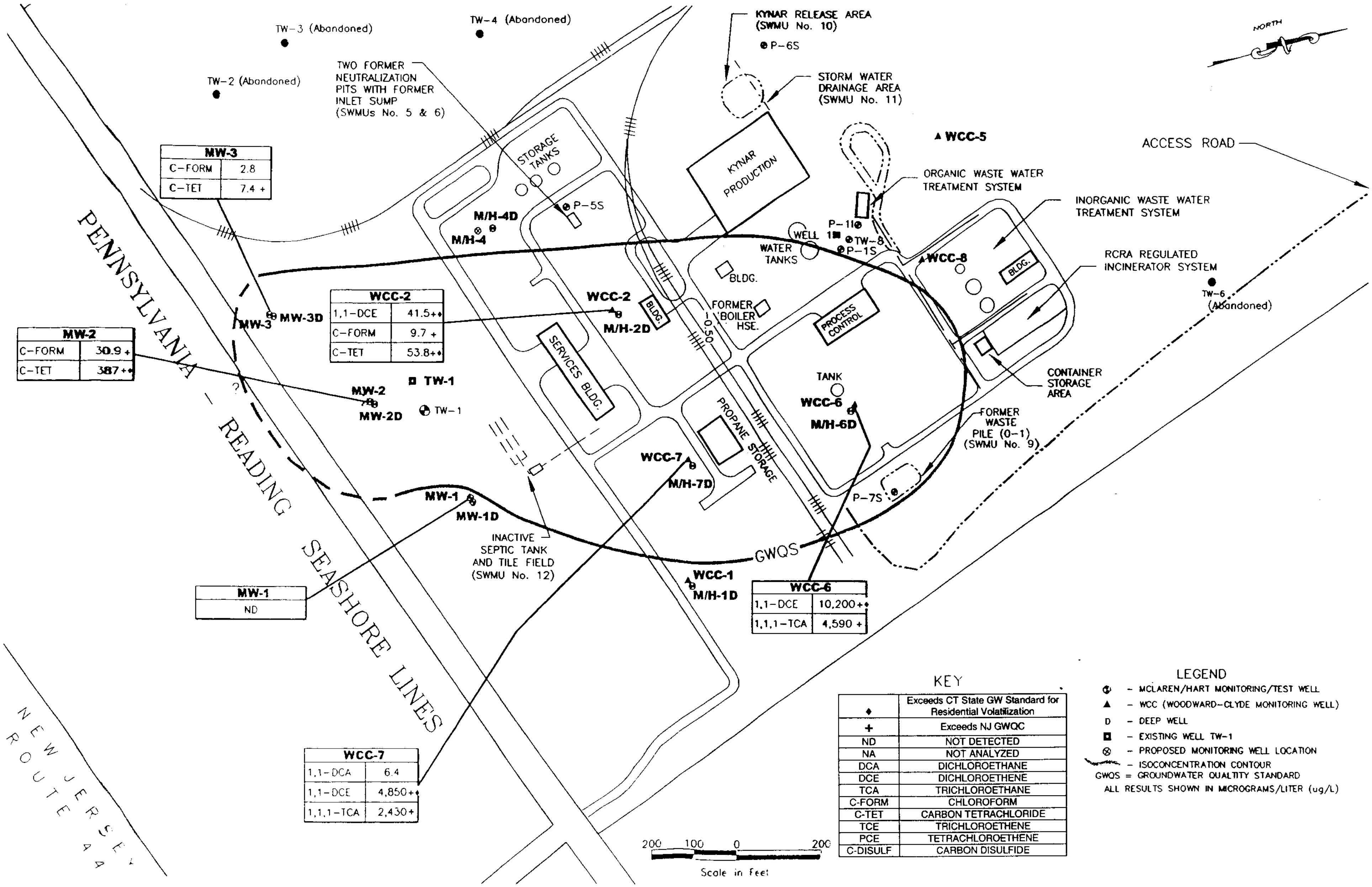


Attachment 2 - SWMU/AOC Map - Dredge Spoils Area in Northern Portion of Site
Source: Remedial Investigation Report Addendum, October, 2000



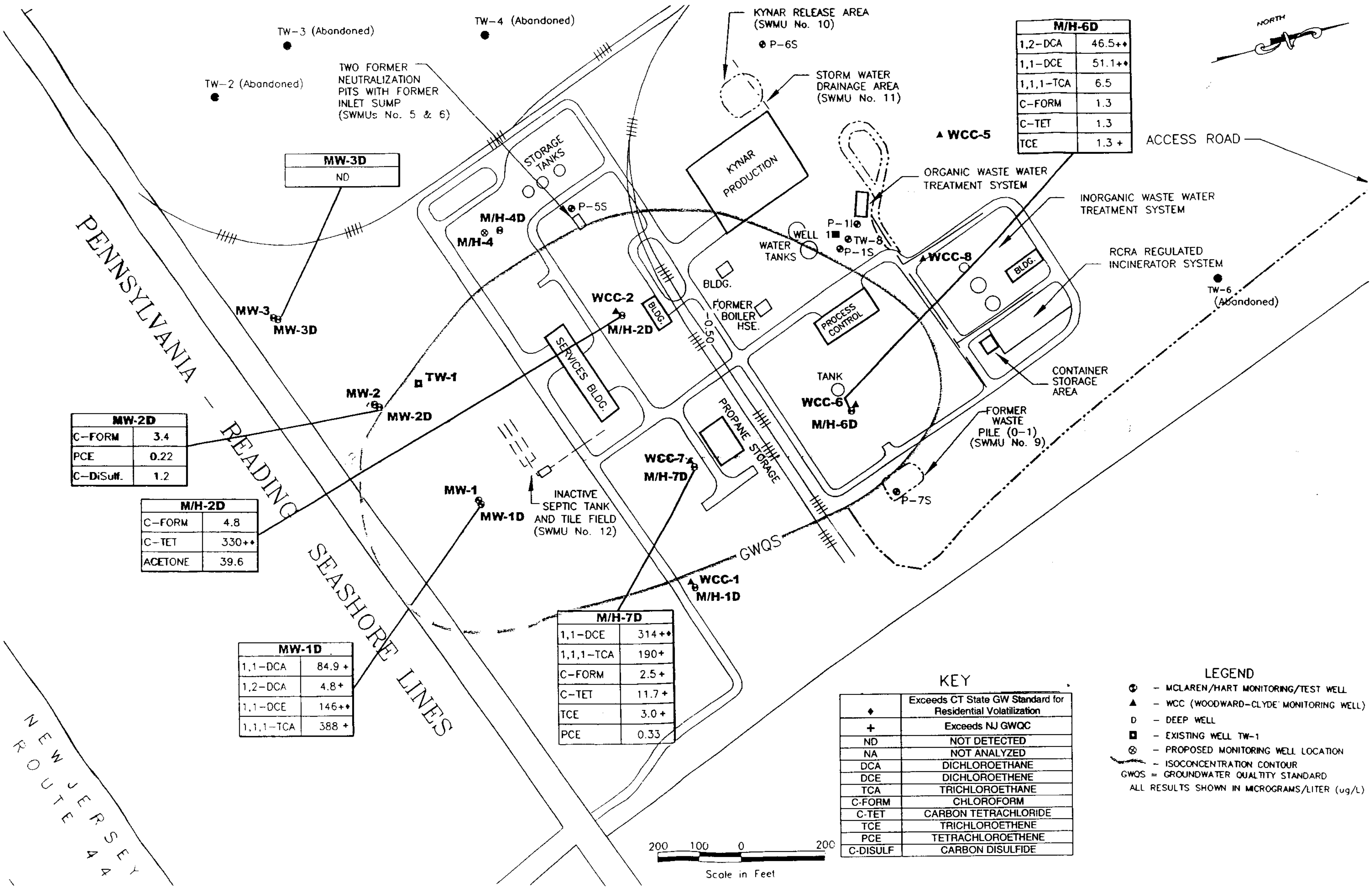
Attachment 3 - December, 1999 Groundwater Sampling Results for the Shallow Zone Aquifer

Groundwater Remedial Investigation Report - VOC Area, October 2000



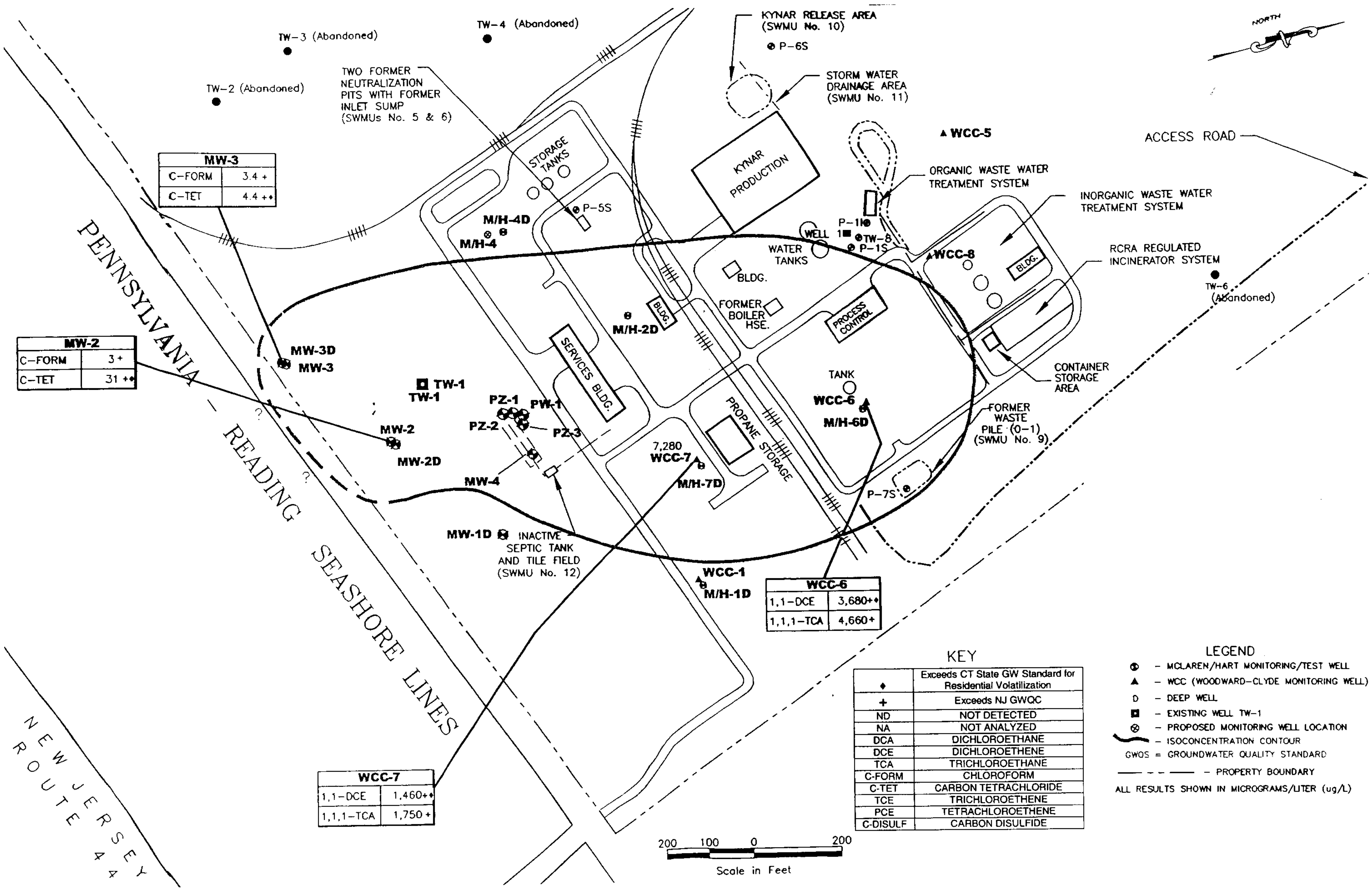
Attachment 4 - December, 1999 Groundwater Sampling Results for the Deep Zone Aquifer

Groundwater Remedial Investigation Report - VOC Area, October 2000



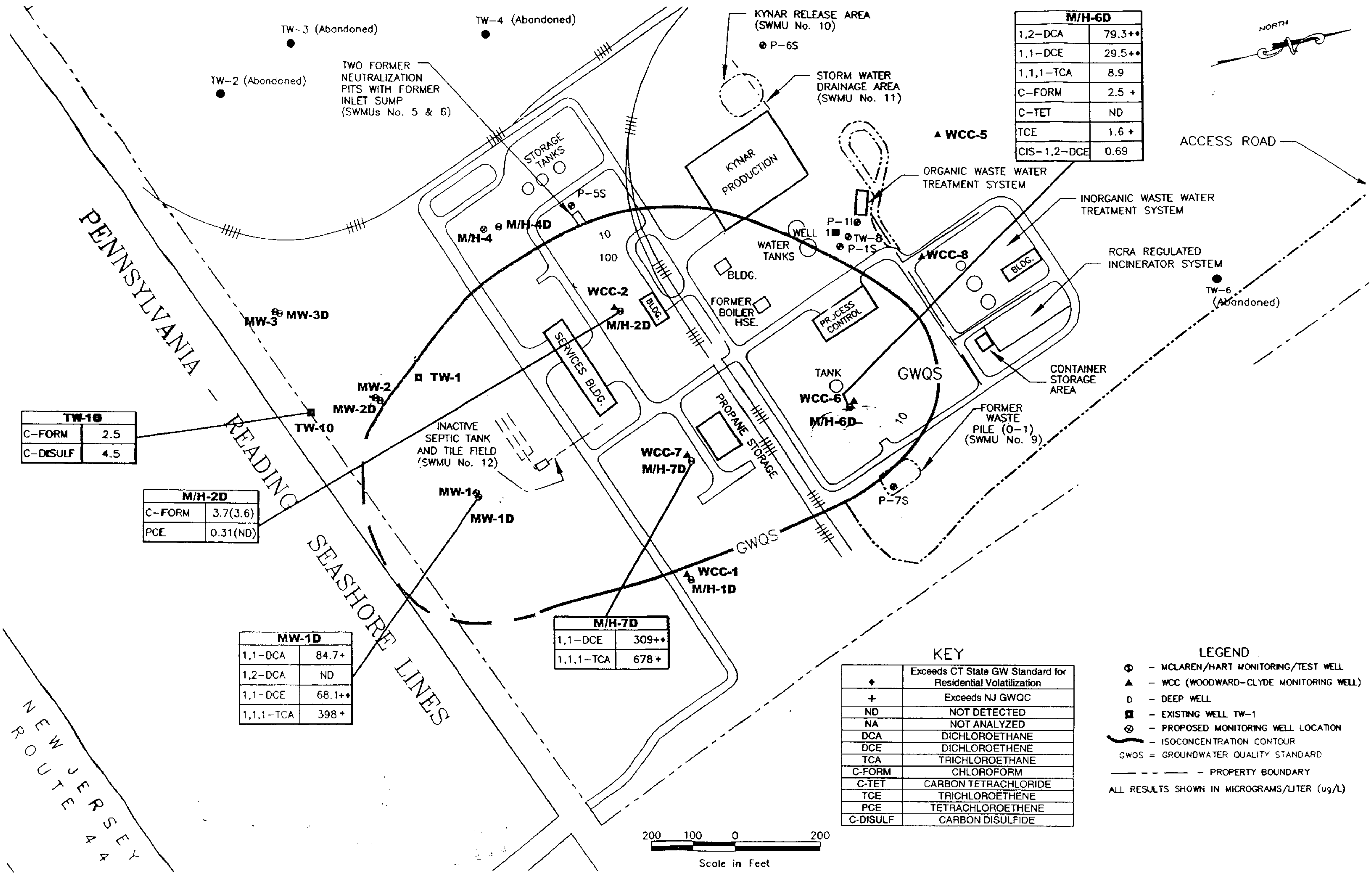
Attachment 5 - April, 2000 Groundwater Sampling Results for the Shallow Zone Aquifer

Groundwater Remedial Investigation Report - VOC Area, October 2000



Attachment 6 - April, 2000 Groundwater Sampling Results for the Deep Zone Aquifer

Groundwater Remedial Investigation Report - VOC Area, October 2000



Attachment 7 - Johnson - Ettinger Model Results

DATA ENTRY SHEET

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (μg/L)	Chemical
75354	3680	1,1-Dichloroethylene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)
15	424.89	S	11

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
CL	OR		1.5	0.43	0.3

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	25	25	250

Used to calculate risk-based groundwater concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($(\mu g/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	5.0E-05	0.0E+00

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
409.89	0.130	0.612	9.65E-10	0.584	5.64E-10	17.05	0.43	0.136	0.294	3,844

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} ($atm\text{-}m^3/mol$)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
5.63E+04	9.24E+05	4.16E-04	15	6,386	1.53E-02	6.58E-01	1.76E-04	5.47E-04	6.31E-04	5.50E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($(\mu g/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
409.89	15	2.42E+06	0.10	5.44E-01	5.47E-04	3.84E+02	7.27E+16	6.71E-06	1.62E+01	5.0E-05	NA

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen ($\mu g/L$)	Indoor exposure groundwater conc., noncarcinogen ($\mu g/L$)	Risk-based indoor exposure groundwater conc., ($\mu g/L$)	Pure component water solubility, S ($\mu g/L$)	Final indoor exposure groundwater conc., ($\mu g/L$)
NA	NA	NA	NA	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.0E-04	NA

Attachment 8 - Summary of Media Impacts Table - Ausimont USA, Inc.

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Area 1A/1B. Chlorine/Isotron and Monomer Railroad Unloading Area.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	VOCs
Area 1C. 100 and 200 Process Area.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 2A. Hydrochloric Acid Rail Car Loading Area.	No	No	No	No	No	No	No	NFA	NFA
Area 2B. Propane Valves and Vaporizers.	No	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 2C. Drainage Ditch System.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Metals
Area 3A. Former Operations Area.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 3B. Stain in 100 Process Area.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 3C. HCL Contamination Lagoon.	No	No	No	No	No	No	No	NFA	NFA
Area 4A. Former Underground Storage Tanks.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 4B. Former Underground Storage Tank.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 5A. Monomer Storage Tank Area - Compressor Pump Pad.	No	No	No	No	No	No	No	NFA	NFA
Area 5B. Steam Blowdown Stain.	No	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 6A. Temporary Storage Area for Monomer Furnace Carbon.	No	No	No	No	No	No	No	NFA	NFA

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Area 6B. Di-Butyl Peroxide Pumps.	No	No	Yes	No	No	Yes	No	▸ Soil excavation	VOCs
Area 7A. Monomer Furnace Area.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation ▸ Cement Slab	Metals
Area 7B. Water Pumps.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 8A. Storm Water Discharge Area.	No	No	No	No	No	No	No	NFA	NFA
Area 8B. Utility Building.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	PCBs
Area 9B. Loading Dock of Polymer Building.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	PCBs
Area 10B. Oil Drum Storage Shed.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 11B. Ditch Stain.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 12B. Dirt Road Stain.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 13B. Compressor Blowdown Stain.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 14B. Inorganic Wastewater Treatment Dumpster.	No	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 15B. Maintenance Shop Drum.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
Area 16B. Roadway Staining by Incinerator.	Yes*	No	Yes	No	No	Yes	No	▸ Soil excavation	Unknown
SWMU 1. RCRA Regulated Incinerator System.	No	No	No	No	No	No	No	NFA	NFA
SWMU 2. Container Storage Area.	No	No	No	No	No	No	No	NFA	NFA
SWMU 3/4. Inorganic and Organic Wastewater Treatment System.	No	No	No	No	No	No	No	NFA	NFA

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
SWMU 5/6. Former Neutralization Pits and Inlet Sump.	Yes*	No	No	No	No	No	No	NFA	NFA
SWMU 7/8/9. Dredge Spoils Area (Former Settling Lagoons, Retention Pond and Waste Pile).	Yes*	No	Yes	No	No	Yes	No	▸ Classification Exemption Area (CEA) proposed for entire dredge spoils area with no ongoing monitoring program ▸ Fencing/Security ▸ Investigations in progress	Metals
SWMU 10/11. Kynar Polymer Release Area and Stormwater Drainage Ditch.	No	No	No	No	No	No	No	NFA	NFA
SWMU 12. Inactive Septic Tanks and Tile Field.	Yes*	No	No	No	No	No	No	NFA	NFA
SWMU 13. Vegetation Area.	No	No	No	No	No	No	No	NFA	NFA

[1] A "No" for soil exceedence does not necessarily indicate there is no contamination present, only that there are no exceedences of the NJ non-residential direct contact soil cleanup criteria.

* There is a chlorinated volatile organic compound (CVOC) plume located in the southern portion of the facility under the active manufacturing area. Contamination has not yet been correlated to a specific area of investigation or SWMU although several areas and SWMUs exist above the CVOC plume. While investigations are still in progress, Ausimont proposes to implement a classification exemption area (CEA) for the CVOC impacted areas on site and immediately off site in downgradient direction. In addition, Ausimont proposes active remediation of highly contaminated areas, combined with monitored natural attenuation and ongoing monitoring.

Attachment 8 - Summary of Media Impacts Table - Ausimont USA, Inc.

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
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Area 1C. 100 and 200 Process Area.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 2A. Hydrochloric Acid Rail Car Loading Area.	No	No	No	No	No	No	No	NFA	NFA
Area 2B. Propane Valves and Vaporizers.	No	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 2C. Drainage Ditch System.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Metals
Area 3A. Former Operations Area.	Yes*	No	No	No	No	No	No	NFA	NFA
Area 3B. Stain in 100 Process Area.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 3C. HCL Contamination Lagoon.	No	No	No	No	No	No	No	NFA	NFA
Area 4A. Former Underground Storage Tanks.	Yes*	No	No	No	No	No	No	NFA	NFA
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Area 5A. Monomer Storage Tank Area - Compressor Pump Pad.	No	No	No	No	No	No	No	NFA	NFA
Area 5B. Steam Blowdown Stain.	No	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 6A. Temporary Storage Area for Monomer Furnace Carbon.	No	No	No	No	No	No	No	NFA	NFA

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Area 7A. Monomer Furnace Area.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation ➢ Cement Slab	Metals
Area 7B. Water Pumps.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
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Area 10B. Oil Drum Storage Shed.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 11B. Ditch Stain.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 12B. Dirt Road Stain.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
Area 13B. Compressor Blowdown Stain.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
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Area 16B. Roadway Staining by Incinerator.	Yes*	No	Yes	No	No	Yes	No	➢ Soil excavation	Unknown
SWMU 1. RCRA Regulated Incinerator System.	No	No	No	No	No	No	No	NFA	NFA
SWMU 2. Container Storage Area.	No	No	No	No	No	No	No	NFA	NFA
SWMU 3/4. Inorganic and Organic Wastewater Treatment	No	No	No	No	No	No	No	NFA	NFA

	GW	AIR (Indoors)	SURF SOIL[1]	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
System.									
SWMU 5/6. Former Neutralization Pits and Inlet Sump.	Yes*	No	No	No	No	No	No	NFA	NFA
SWMU 7/8/9. Dredge Spoils Area (Former Settling Lagoons, Retention Pond and Waste Pile).	Yes*	No	Yes	No	No	Yes	No	➢ Classification Exemption Area (CEA) proposed for entire dredge spoils area with no ongoing monitoring program ➢ Fencing/Security ➢ Investigations in progress	Metals
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SWMU 12. Inactive Septic Tanks and Tile Field.	Yes*	No	No	No	No	No	No	NFA	NFA
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