

Health Assessment for



D' IMPERIO PROPERTY SITE
HAMILTON TOWNSHIP, NEW JERSEY

AUGUST 11, 1988



SUMMARY

The D'Imperio Property Site is an inactive National Priorities List waste disposal site consisting of two disposal areas, Sites 1 and 2. These areas are approximately 600 feet apart. Their sizes are one-acre and one-half acre, respectively, within the approximate 200-acre area. Site 1 consists mainly of partially buried metal drums, most of which have ruptured. Site 2 consists mainly of domestic refuse. Primarily, the drums in Site 1 contained various organic compounds, including solvents, which have contaminated the soil and groundwater at the site. The contaminant plume has been detected in both the Bridgeton and Upper Cohansey aquifers and the forward edge of the plume was approximately 800 feet southwest of Site 1. Twenty residential drinking water wells were identified within 1 mile of the site, the closest well is approximately 300 feet upgradient and the closest downgradient well is approximately 1,400 feet away. The available data indicated the residential wells were not contaminated by compounds from the site. However, more current data is needed to evaluate the present exposure potential. Some samples indicated several residential wells had lead concentrations above levels of concern. The residents should be informed of the potential for adverse chronic health effects from the use of water containing elevated lead concentrations. The remedial workers should be properly trained and equipped with personal protective equipment. The remedial actions described in the Record of Decision (ROD) address the Agency for Toxic Substances and Disease Registry (ATSDR) health concerns for the site, but should land use change, further review by ATSDR may be warranted.

BACKGROUND

A. SITE DESCRIPTION

The D'Imperio Property Site is located in Hamilton Township, Atlantic County, New Jersey. It is a semi-rural region of the county and within the New Jersey Pinelands Reserve. The site is relatively flat with mixed vegetation such as coniferous and deciduous trees and thick ground cover. The closest surface water is approximately 2,000 feet to the north and consists of the Babcock Swamp wetlands, which are drained by a creek (Babcock Creek). The disposal areas were cleared areas within the property boundary, and drums were dumped on the surface and partially covered. Prior to remediation, Site 1 was estimated to contain approximately sixty 55-gallon drums, many 1-gallon size glass bottles, in-line filters, oil sludges, and dry waste solids. Drum markings were illegible and most drums had rusted through and spilled their contents into the ground. Site 2 surface disposal area was covered with paper, plastics, metal appliances, pipes, and miscellaneous domestic items. No industrial type wastes were indicated in this area. There was no information concerning the waste disposal operations; although, there was indication that the unauthorized dumping took place between the late 1960's and the mid 1970's.

B. SITE VISIT

A site visit was not conducted by ATSDR personnel.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION

The contamination consists primarily of volatile organic compounds (VOC's) and some acid/base-neutral extractables. Metal analyses were performed on some soil samples. Although the concentrations of the analytes generally approximated typical background levels, there were some areas with high concentrations of lead, chromium, and zinc. Air monitoring was conducted during the Remedial Investigation (RI) and the results indicated that, generally, the levels approximated background levels. The soils had different contaminants than the groundwater, presumably because of water solubilities and adsorptive properties of the contaminants. The following table, Table 1, lists the major contaminants found on-site, the depth and maximum concentration reported.

TABLE 1

<u>COMPOUND</u>	<u>MEDIA/DEPTH</u>	<u>CONC.</u>	<u>DEPTH</u>	<u>CONC.</u>
1. acetone	soil, 1 foot	ND	5 feet	3,070 mg/kg
2. 2-butanone	soil, 1 foot	ND	10 feet	45,000 mg/kg
3. bis (2-ethylhexyl) phthalate	soil, 1 foot	81,000 mg/kg	10 feet	ND
4. di-n-butyl phthalate	soil, 1 foot	34,000 mg/kg	10 feet	ND

Table 1 Continued

TOTAL VOLATILE ORGANIC COMPOUNDS¹

<u>MONITORING WELL LOCATION TO SITE 1</u>	<u>GROUNDWATER/ DEPTH</u>	<u>CONCENTRATION IN UG/L</u>
1. Well 03, 75'WSW	25 feet	582,000
2. Well 03a, 275' SW	15	63,500
3. Well 06, (beside 03)	40 feet	4,000
4. Well 20-3, 300' SW	46 feet	612
5. Well 23-2, 550' SW	52 feet	3,400

¹ Total Volatile Organics consist of the following compounds: acetone, 2-butanone, methylene chloride, trichloroethylene, 4-methyl-2-pentanone and various other chlorinated solvents and xylenes. The total volatiles reported were more than 85 percent acetone and 2-butanone.

In 1987, some on-site remediation had occurred, 3,400 cubic yards of contaminated soil was excavated and the surface debris was removed.

B. OFF-SITE CONTAMINATION

The contaminants migrating off-site are the same as found on-site, namely the VOC's. The data indicates that the contamination is only in the groundwater; however, both the Bridgeton and Upper Cohansey aquifers are contaminated. The area residential wells, which draw water from these aquifers, were not contaminated with any VOC's from the site at the time samples were taken (1983). However, the analytical results indicated there were 7 domestic wells in which the lead concentration exceeded 15 ug/l.

C. PHYSICAL HAZARDS

The disposal areas, Sites 1 and 2, were enclosed by a chain link fence thereby restricting access to the contaminated area. There were no reported physical hazards on-site.

DEMOGRAPHICS OF POPULATION NEAR SITE

The site is in a semi-rural area of Atlantic County, New Jersey, approximately 4 miles due east of Mays Landing, New Jersey. The D'Imperio Property is located in the triangle formed by Cologne Road, U.S. Route 322 (Blackhorse Pike), and U.S. Route 40. There are numerous apartment and condominium complexes along Cologne Road and Blackhorse Pike, along with several single family residences. Most of these developed areas are more than one-half mile from the site. There was 1 motel within 1,000 feet of the site. Drinking water is supplied to these areas by the Hamilton Township; however, the older single family residences may have private wells. Twenty private wells were identified within 1 mile of the site and

consisted of private residences, a school, restaurants, etc. These wells ranged from 40 to 160 feet deep; however, no data were available as to which aquifer the wells draw their water. The RI assumed that water was drawn from both the Upper Cohansey Aquifer and the Bridgeton Aquifer.

EVALUATION

A. SITE CHARACTERIZATION

1. Environmental Media

The site was well characterized using adequate quantities of soil and soil boring samples and groundwater samples to delineate the area of contamination at the time of the RI. However, several years have passed and conditions may have changed significantly. Current results of groundwater analyses, especially from the residential wells, would be valuable in determining the extent of migration of the contaminants and if the residential wells had become contaminated.

2. Land Use and Demographics

This area was experiencing moderate growth and this growth is expected to continue. The ROD did not address future land uses for the site. Should site zoning change, further review by ATSDR may be necessary since this assessment is based on the site remaining a closed facility.

3. Quality Assurance and Quality Control

It was assumed that the analytical data has been reviewed by the United States Environmental Protection Agency and has met their acceptability criteria. The conclusions in this Health Assessment were based on the information received. The accuracy of these conclusions is determined by the availability and reliability of that information.

B. ENVIRONMENTAL PATHWAYS

The soil and groundwater contaminant migrations are the environmental pathways of concern. Soil and soil boring samples indicated that the area around Site 1 was contaminated with VOC's and acid/base-neutral compounds. The analytical results indicated the volatile compounds, such as acetone and 2-butanone, had migrated both vertically and horizontally, but the acid/base-neutral compounds were relatively stationary. The type and concentration of contaminants varied both vertically and horizontally but they were generally in the upper 10 feet of soil. Site 2 was not contaminated with industrial wastes.

The groundwater was contaminated in the Bridgeton and Upper Cohansey Aquifers. The data indicated the Bridgeton had the higher concentrations of VOC's. The highest concentration was approximately 580,000 ug/l. The contamination extended downgradient with the leading edge of the plume approximately 800 feet from the disposal area and concentrations less than 50 ug/l. The Upper Cohansey also showed contamination but the

concentrations and extent were less. The sampling point proximal to the one with the highest concentration in the Bridgeton Aquifer but taken in the Upper Cohansey had contamination of approximately 4,000 ug/l. Concentrations around 50 ug/l were determined to have migrated approximately 500 feet from the disposal site.

Air monitoring was performed on-site using various methods. There were several sampling locations chosen for time-weighted air monitoring using tenax tubes. There was not enough information given in the RI and Appendix E to determine which samples came from what location and the concentrations of contaminants found in the air. Air monitoring using the other monitor (HNU) gave no indication the concentrations of volatile compounds were above the detection limit of the instrument, generally 1-5 ppm.

There was no surface water on-site and the available data indicated migration was occurring mainly by groundwater transport and not by surface water run-off. Therefore, surface water is considered to be of minimal health concern. Similarly, the disposal area and immediate surroundings are not used for agricultural enterprises and no samples were collected.

C. HUMAN EXPOSURE PATHWAYS

The residents having private wells in the area and remedial workers are the populations of concern.

The groundwater of both the Bridgeton and Upper Cohansey Aquifers are contaminated by compounds from the site. The residential wells in the area receive water from these two aquifers; however, the available data (1983) indicated the residential wells were not contaminated. There is the potential for exposure of area residents by using the groundwater for domestic purposes (drinking, bathing, cooking, etc.). The leading edge of the contaminant plume had been detected more than half the distance between the site and the closest downgradient private well.

The remedial workers may be exposed through dermal contact with the soils and inhalation of the vapors from the VOC's as the remedial activities continue.

PUBLIC HEALTH IMPLICATIONS

The VOC's, generally, can cause central nervous system effects and liver and kidney toxicity. The two major compounds detected were acetone and 2-butanone, both potentiate the hepatotoxicity of chlorinated solvents, (trichloroethylene and other chlorinated solvents were also detected on-site). Dermal contact with solvents may also produce skin irritation.

CONCLUSIONS AND RECOMMENDATIONS

Based on the information reviewed, ATSDR has concluded this site is of potential health concern because of the potential risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Environmental Pathways and Human Exposure Pathways sections above, human exposure to VOC's may occur via ingestion of contaminated groundwater.

The proposed remediation actions delineated by the ROD addresses most of the concerns about the contaminated groundwater and provide for the removal of these contaminants consistent with the appropriate standards, (Safe Drinking Water Act, State water quality standards, etc.). There were no provisions made for monitoring private wells in the affected area.

Although none of the residential wells were contaminated with compounds from the site, the groundwater off-site is contaminated. Data from the 1983 sampling indicated the contamination plume had extended in the direction of the private wells. However, current sampling of the residential wells would ensure the groundwater used by the residents was not contaminated.

Lead was detected in the water samples from seven area residences. The concentrations of lead found may be caused by any number of reasons. The groundwater contamination by site-related compounds was not indicated as a source of the lead contamination. Although the concentrations did not exceed the drinking water standards, adverse health effects can be attributed to lead in concentrations below the current Maximum Contaminant Level and below the reported residential concentrations. While the source of the lead contamination is unknown, these conditions, which may adversely affect human health, should be brought to the attention of the residents.

The potential for adverse human health exposure to on-site contaminants after remedial activities appears minimal. The previous excavation of the source of contaminants and the future construction of a Resource Conservation and Recovery Act cap over the excavated dump area adequately reduces the source and the possibility of dermal contact. The pumping and treating of the groundwater will reduce the potential for exposure through the domestic use of the groundwater. If site zoning and/or land use changes, then further ATSDR review may be warranted.

The recommendations are as follows:

1. Resample and reanalyze residential wells for verification of lead contamination. Inform residents having lead contaminated water of the potential for adverse human health effects.
2. Sample the residential wells and analyze for VOC's, as a precautionary measure.

3. Provide remedial workers with appropriate personal protective equipment and training in its proper use.
4. Depending on future land use, further ATSDR review may be warranted.
5. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act as amended, the D'Imperio Property site has been evaluated for appropriate follow-up with respect to health effects studies. Although there are indications that human exposure to off-site contaminants may be occurring and may have occurred in the past, this site is not being considered for follow-up health studies at this time because no definitive exposure has been confirmed.

PREPARER OF REPORT

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REFERENCES

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2. Record of Decision, D'Imperio Property Site, USEPA Region II, March 1985.
3. Klaassen, Curtis, Amdur, Mary, Doull, John (editors), Toxicology - Basic Science of Poisons, 3rd edition, Macmillan publishing Co., New York, 1986.
4. 29 CFR 1910, Occupational Safety and Health Administration, 1978.