

Health Assessment for

EWAN PROPERTY

CERCLIS NO. NJD980761365

SHAMONG TOWNSHIP, BURLINGTON COUNTY, NEW JERSEY

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Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104(i)(7)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, this Health Assessment has been conducted using available data. Additional Health Assessments may be conducted for this site as more information becomes available.

The conclusions and recommendations presented in this Health Assessment are the result of site specific analyses and are not to be cited or quoted for other evaluations or Health Assessments.

**HEALTH ASSESSMENT
EWAN PROPERTY
BURLINGTON COUNTY
SHAMONG TOWNSHIP, NEW JERSEY**

Prepared by:
Environmental Health Service
New Jersey Department of Health

Prepared for:
Agency for Toxic Substances and Disease Registry (ATSDR)

OBJECTIVES

The Remedial Investigation (RI) and the Feasibility Study (FS) of the Ewan Property site have been completed. A Record of Decision (ROD) was signed on September 29, 1988. The alternative that will be used to remediate the site has been discussed with concerned citizens at a public meeting in August 1988. At this stage of the study the objectives of the Health Assessment are to:

- * assess the potential current and past effects of the site on public health,
- * evaluate if the selected remedial alternative adequately addresses public health issues,
- * identify and fill in, if possible, any information or data gaps,
- * evaluate if implementation of the remedial alternative could potentially adversely impact public health,
- * identify and recommend immediate actions that could be taken to reduce the public health impacts of the site and site remediation, and
- * Assess whether a health study of the site is indicated.

SUMMARY

The sources of contamination at the Ewan Property are drums of hazardous chemicals that were buried on the site. Sampling and analysis of the groundwater below the site, along

with on-site soil borings and test pits, show contamination. To date, the groundwater plume from the site has not reached potable wells. A population that has been exposed to the contaminants on the site has not been defined. The community near the site has expressed concerns over the public health impacts of the site.

On the basis of the information reviewed, the Ewan Property Site is considered to be a public health concern. However, since human exposure to on-site/off-site contaminants is not documented, the Ewan Property Site is not being considered for follow-up health studies.

SITE DESCRIPTION

Ewan Property is situated in a rural area of Burlington County, although the area around it is rapidly being developed for housing. It is relatively isolated from residential areas. The property had been used for drum disposal (burial) in 1974 and 1975 when between 500 and 8,000 drums were apparently buried in a 9-acre portion of the property (RI Report).

The site was divided into two study areas, Area A and Area B. Contamination was detected in Area A. Remediation of only Area A was recommended by the Environmental Protection Agency (EPA), as there was no evidence of contamination by hazardous waste dumping in Area B. Likewise, this Health Assessment only focuses on Area A.

Since the residences in the area are on potable water supply, the groundwater exposure pathways have been a major concern. To date, it does not appear that the contamination has reached any of the potable wells.

The final Remedial Investigation/Feasibility Study (RI/FS) has been completed and approved. The ROD was recently signed (September 29, 1988). A risk assessment was conducted for EPA in the RI and a remedial alternative for cleaning up the site has been selected. This alternative consists of excavation, waste characterization, and thermal destruction of the wastes on-site. (Wastes that are not appropriate for thermal destruction will be assessed to determine appropriate methods of treatment and/or disposal.) This alternative also includes constructing a fence around Area A, building roads, clearing the area of vegetation, and developing a contingency plan for excess volatilization or spillage. After remediation, Area A will be covered with clean fill. (Draft Record of Decision)

SITE VISIT

A site visit to the Ewan Property was conducted in August 1988. The site was isolated from any immediate residential areas, but was unfenced and unmarked. Trespassing was therefore possible and deer blinds had been built on the property. To get to the site, one has to travel behind homes on Wallingford Way. These homes are currently the homes closest to the site. Parts of drums that had been buried on the site were exposed, either where test pits had been dug or where the soil had been eroded under the dirt road surface. Numerous homes are being built in the area near the site.

COMMUNITY CONCERNS

Review of EPA documents, attendance at an EPA public hearing, and conversations with concerned citizens have revealed a complex scope of issues with respect to the Ewan Property Site. Most concerns center around the contamination of groundwater and the health risks associated with this contamination. The community's concerns may be summarized as follows:

- * The community's perception of adverse health effects (birth defects and leukemia) resulting from exposure to contaminants on the site.
- * What is the nature and extent of groundwater contamination in the area of the site?
- * Concern over the security of the site once the remediation construction process begins.
- * The nature and extent of any wastes found in Area B of the site.
- * The adequacy of federal and state drinking water standards (ARARs) in protecting public health.
- * Safety of area during remediation of site.
- * The local community has expressed little faith in ground water test results to date.

Other community concerns center around the identification and consequent financial liability of parties responsible for the contamination, the adequacy of funding for the remediation of the site, and real estate values and information that is

provided to new home owners. Values of existing homes have been negatively impacted by the site. Additionally, new homes are being constructed immediately adjacent to the site boundary. There are no laws currently mandating that the new home owners be supplied with information about the site as a condition of sale.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

Media of the site that were sampled included soil (surface and subsurface), groundwater, surface water, sediment, air, soil gas, and potable wells. Geophysical surveys were also conducted to identify area of buried drums. Unless otherwise specified, the information in this section is from the RI Report.

Two aquifers below the site, the Cohansey Sand and the Kirkwood Formation, are hydraulically linked. The groundwater under the site flows south, at a very slow speed. Monitoring wells both on-site and off-site revealed contaminants in the groundwater. These contaminants included aromatic compounds, chlorinated aliphatic compounds, phthalates, and metals. Specific chemicals that were detected at appreciable concentrations were acetone, benzene, toluene, methylene chloride, 1,2-dichloroethane, methylisobutylketone, ethylbenzene, chloroform, xylenes, and bis (2-ethylhexyl) phthalate. Inorganic chemicals that were detected at above federal or state drinking water standards in the monitoring wells on or near the site were iron, manganese, aluminum, chromium, and barium.

Potable well samples were taken of wells south of the site. The only chemical that exceeded a drinking water standard (MCL) in the potable wells was copper, which was not associated with contamination from the site (could be due to pipes and acidity of the groundwater).

Numerous organic and inorganic compounds were detected, above expected background levels, in the soils on the site. These included acetone, 2-butanone (MEK), 4-methyl-2-pentanone, toluene, trans-1,2-dichloroethylene, ethylbenzene, xylenes, trichloroethylene (TCE), tetrachloroethylene, methylene chloride, acenaphthene, 2-methylnapthalene, antimony, arsenic, barium, beryllium, chromium, copper, mercury, vanadium, and zinc.

Samples from surface water on the site did not reveal any concentration of compounds above expected background concentra-

tions. Organic compounds, which were detected in the sediment of the streams, were low in concentration and could be due to agricultural use of the land (pesticides) and/or some contamination from the site.

Air samples were measured with a photoionization detector (PID). Ambient air readings taken before investigative work on the site began did not reveal any organic compounds in the air above background levels. However, during test pit excavations and drilling of wells, elevated concentrations were detected. The highest concentration was detected at the opening of a drum. These levels do not pose a public health concern for people off of the site.

Table I summarizes the contaminants of concern in soils and sediments. Table summarized the contaminants of concern in surface and ground water.

Table 1 - Maximum Concentrations of Contaminants of Concern.

Contaminants	Soils (ppm)	Sediments (ppm)	Test Pits (ppm)	Ground Water (ppb)
Acetone	110	105	-	190
Benzene	-	-	-	50
Toluene	670	43	-	680
Methylene Chloride	77	150	-	230
Ethylbenzene	20	-	6	450
Xylenes	77	-	38	2,800
Bis(2-Ethylhexyl) Phthalate	28	-	65	300
2-Butanone	44	-	580	600
4-Methyl-2-Pentanone	97	-	21	52
Trans-1-2-Dichloroethylene	-	-	14	21
1,2-Dichloroethane	-	-	-	1,300
Chloroform	-	-	-	31
Trichloroethylene	8.1	-	-	16
Tetrachloroethylene	24	-	-	2
2-Methylnapthalene	440	-	11,000	5,300
Acenaphthene	9.7	-	-	150
Chromium	11.4	7	512	208
Barium	2.7	118	760	1,800
Arsenic	-	-	83	-
Beryllium	-	-	9	-
Vanadium	-	13.1	658	257

(Data is from Draft Remedial Investigation Report, 1988.)

QUALITY ASSURANCE/QUALITY CONTROL

A review of quality assurance/quality control (QA/QC) was conducted by EPA. The reported QA/QC problem was in analyzing the volatile organic compounds (VOCs) in some of the test pits. As a result, the concentrations of the VOCs in these test pits are not known. This QA/QC problem is not judged to be crucial enough to appreciably affect the conclusions of this Health Assessment or to warrant further evaluation of the site, which would delay remediation.

DEMOGRAPHICS

The most recent demographic information available on the site is from the early 1980s. Although the area around Ewan Property is reported to be sparsely populated and rural, it is rapidly growing, as noted during the site visit. Some of the demographic information may therefore be outdated. According to the 1980 census, the population of Shamong Township was reported to be 4,537. In 1983, there were 220 single-family homes 1 mile of the site. The closest residences are approximately 1,000 feet from the site, and the closest residential community is Indian Mills, which is approximately 1 mile to the west. The sources of drinking water are private potable wells.

The demographic information provided in the RI report needs to be updated. In addition, the presence of sensitive populations in the area needs to be addressed.

ENVIRONMENTAL DATA GAPS

The site has been adequately characterized. EPA has correctly identified the potential contamination of potable wells as being the primary concern associated with the site. Potable wells downgradient from the site have been found to be free of site-related contaminants. Computer modelling of the contaminant plume has demonstrated that it will take many years (at least 20 years) for the contaminant plume to reach the nearest domestic well.

At this stage of the study, it is important to begin to remediate the contamination that has been found and to remove the drums and the adjacent contaminated soils. Information that is still vital to the remediation of the site is to know how many drums may be buried on the site and the boundaries of the groundwater plume, that will need remediation.

EXPOSURE PATHWAYS

In its current condition, important environmental pathways from the Ewan Property site have been identified. However, the health hazard that may be associated with the remediation of the site needs to be considered. These hazards concern the disturbance of the soils and the truck traffic that will be needed to remove the drums and soils from the site.

Under current conditions, contaminated groundwater is considered to be the environmental pathway of primary concern. However, groundwater modelling has suggested that the plume under the site would not reach the potable wells for at least 20 years (RI Report). If the groundwater is adequately remediated, no exposure to contaminants in the groundwater would occur. Other potential exposure pathways are direct contact with soil, surface water, or sediment, along with inhalation of air and consumption of animals and plants in the area of the site.

The site is used for horseback riding and hunting. However, as the problem with the site is associated with buried drums, high concentrations of contaminants were not detected in surface soil samples. Contact with soils is not considered to be a major exposure pathway of concern. The surface water on-site is part of the Batsto River watershed. However, elevated contaminants in the surface water were not detected. The concentrations of contaminants in the sediment are not considered to be a major concern, since they were low and contact with the sediments would likely occur only sporadically. Elevated concentrations of contaminants in air were detected only when wells were bored or test pits were dug. Vegetation on the site also aids in reducing levels of wind blown dust. Exposure could currently occur if trespassers on the site disturbed the soil.

Exposure to contaminants on the site could increase in the future, particularly during remediation, when the soil is disturbed and vegetation is removed, and when the integrity of some of the drums is reduced by movement, digging, or age, causing chemical spills. Disturbing the soil could bring subsurface contaminated soil into the surface, could suspend contaminated dust, and could increase the amount of contaminants that would be leaving the site (via runoff to surface water or release to air). Potential exposure pathways may then include direct dermal contact with and ingestion of the soil, along with inhalation.

PUBLIC HEALTH IMPLICATIONS

At the present time, no documented exposure pathways have been delineated that represent a clear hazard to the health of the residents in the area. Potential for exposure in the future could occur via the pathways that are described in the above section. Exposure via these pathways, depending on the precautions that are taken, could pose a risk to the public health. Precautions necessary to prevent exposure are discussed in the ROD.

CONCLUSIONS AND RECOMMENDATION

On the basis of the information reviewed, the Ewan Property Site is considered to be a potential health concern. As noted in Environmental Contamination and Physical Hazards section, there are contaminants in the soil and groundwater that could pose a potential public health concern, if people are exposed to the contaminants at current concentrations.

The site has been adequately characterized for remediation. Remediation of the site needs to begin soon. Precautions need to be taken so that the public and workers are not excessively exposed to contaminants from the site during the remediation process.

Restricting access to the site and using optimal dust control methods during excavation could be used to reduce exposure via these pathways. In addition, it is important for the workers on-site to follow all applicable National Institute of Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) regulations and guidelines. Air monitoring at the periphery may be necessary if the remediation procedures generate appreciable amount of dust.

A concern that was expressed by the community was the possibility of trucks driving near residential areas with contaminated soil or drums. Actions need to be taken to assure that there are no problems with the trucks driving through residential areas. Such actions could include fencing off the access road that the truck may use to go on and off of the site and washing down the trucks before they leave the site.

Members of the community around the Ewan Property site have expressed a concern that contaminants from the site may have caused an increase in birth defects and leukemia. NJDOH will investigate the validity of this community concern, when this health assessment is updated.

Although groundwater modelling data has indicated that groundwater is not an exposure pathway in the near future, periodic monitoring of groundwater to verify the model is recommended, until remediation is initiated.

In accordance with CERCLA as amended, the Ewan Property site has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to on-site and off-site contaminants is not documented, the Ewan Property Site is not being considered for follow-up health studies at this time. However, if after investigation of the concerns of increased rates of birth effects and leukemia or if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR and NJDOH will reevaluate this site for any indicated follow-up.

This Health Assessment was prepared by the State of New Jersey, Department of Health, Environmental Health Service, under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry. The Division of Health Assessment and Consultation and the Division of Health Studies of ATSDR have reviewed this Health Assessment and concur with its findings.

REFERENCES

Superfund Documents:

- Remedial Investigation Report on Ewan Property Site.
June 24, 1988.
- Draft Record of Decision, September 1988.

Interviews:

- Site Manager, New Jersey Department of Environmental Protection
- Technical Coordinator, New Jersey Department of Environmental Protection
- Health Officer, Burlington County Department of Health
- Several citizens who attended the public meeting on Ewan Property held in August 1988.