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EPA Superfund
Record of Decision:

MONITOR DEVICES, INC./INTERCIRCUITS, INC.
EPA ID: NJD980529408
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WALL TOWNSHIP, NJ
09/30/2005

RECORD OF DECISION

Monitor Devices/Intercircuits, Inc. Site
Operable Unit One - Groundwater
Wall Township, Monmouth County, New Jersey

United States Environmental Protection Agency
Region II
September 2005

DECLARATION STATEMENT

RECORD OF DECISION

SITE NAME AND LOCATION

Monitor Devices/Intercircuits, Inc. Site (EPA ID#NJD980529408)
Wall Township, Monmouth County, New Jersey
Operable Unit 1 - Groundwater

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for contaminated groundwater at the Monitor Devices/Intercircuits, Inc. site, in Wall Township, Monmouth County, New Jersey. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based, on the Administrative Record file for the site.

The State of New Jersey concurs with the Selected Remedy.

ASSESSMENT OF THE SITE

The response action selected in this Record Of Decision (ROD) is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances from the site into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action addresses groundwater contamination at the site. A Remedial Investigation of soil contamination has been performed; however, the Environmental Protection Agency (EPA) and the State of New Jersey are still evaluating the nature and extent of soil contamination that may be associated with the site.

The Selected Remedy described in this document involves the *in situ* bioremediation of volatile organic compounds (VOCs) in the groundwater. The major components of the selected response measure include:

- *In situ* treatment of VOC contaminants in the groundwater through enhanced bioremediation;

- Establishing groundwater recirculation loops, as necessary, involving extraction of contaminated groundwater within the 10 part per billion portion of the plume, followed by on-site reinjection of groundwater and amendments, to support in situ bioremediation;

- Long-term monitoring; and

- Institutional controls, such as the implementation of a Classification Exemption Area to restrict the use of groundwater within the area until the aquifer is restored.

DECLARATION OF STATUTORY DETERMINATIONS

Part I: Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial actions to the extent practicable, and is cost-effective. EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site.

Part 2: Statutory Preference for Treatment

The Selected Remedy meets the statutory preference for the use of remedies that involve treatment as a principal element.

Part 3: Five-Year Review Requirements

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the two sites.

- Chemicals of concern and their respective concentrations may be found in the "Site Characteristics" section.

- Baseline risk represented by the chemicals of concern may be found in the "Summary of Site Risks" section.

- A discussion of cleanup levels for chemicals of concern may be found in the "Remedial Action Objectives" section.

- A discussion of source materials constituting principal threats may be found in the "Principal Threat Waste" section.

- Current and reasonably-anticipated future land use assumptions are discussed in the "Current and Potential Future Site and Resource Uses" section.

- A discussion of potential land use that will be available at the sites as a result of the Selected Remedy is discussed in the "Remedial Action Objectives" section.

- Estimated capital, annual operation and maintenance (O&M), and total present worth costs are discussed in the "Description of Alternatives" section.

- Key factors that led to selecting the remedies (i.e., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decisions) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

George Pavlou, Director
Emergency and Remedial
Response Division
EPA - Region II

9/30/05
Date

Decision Summary

Groundwater Monitor Devices Site,

Wall Township, Monmouth County, New Jersey

United States Environmental Protection Agency

Region II

September 2005

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SITE NAME, LOCATION AND BRIEF DESCRIPTION

The Monitor Devices site is located in Wall Township, Monmouth County, New Jersey. The former facility occupies two acres in the industrial park of the Allaire Airport (also known as the Monmouth County Airport) off Route 34 (see Figure 1). Monitor Devices formerly occupied Building 25 in the industrial park, which is located along the airport access road at the intersection of George and Edward Streets, Building 25 is currently occupied by a local business and used as a repair and storage facility. The area surrounding the site and the Monmouth County Airport is zoned for mixed commercial and light industrial use, with residential zoning nearby as well. Several industrial parks, light industry, commercial properties and undeveloped areas border the airport to the south and west. The airport and commercial park are currently active.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Monitor Devices, Inc., operated in Building 25 from 1977 to 1980. The Monitor Devices operation primarily involved the manufacture and assembly of printed circuit boards used by companies in the computer industry.

As part of the manufacturing process, circuit panels were plated with copper, lead, nickel, gold, and tin. The various plating processes required both electrolysis and electroplating lines. Effluent from the electrolysis and electroplating lines was directed to three pipes that discharged to the rear of the building. The pipes discharged rinse waters. from the nickel-gold plating and electrolysis, rinse water from the copper and lead electroplating line, and alkaline washing solution. Volatile organic compounds (VOCs) such as trichloroethylene (TCE) were used as solvents and cleaners in a variety of facility operations.

A complaint against Monitor Devices was filed with the Monmouth County Department of Health (MCDH) in January 1980. In response to the complaint, the MCDH visited the Monitor Devices facility and observed discolored effluent from discharge pipes. Sampling identified elevated levels of copper, lead, and mercury in the effluent and in the stained soils.

In early. 1980, site inspections by EPA and the New Jersey Department of Environmental Protection (NJDEP) noted effluent pipes discharging wastewater directly onto the ground, at rates of as much as two gallons per minute. Wastewater that was not percolating into the ground was observed to be flowing around the building and along an access road. A small dam had been constructed to control the migration of manufacturing effluent, resulting in a small unlined pond. Drums of acetone, isopropyl alcohol and a variety of acids were also stored at the site, apparently to be used as part of the facility operations.

NJDEP determined that Monitor Devices never possessed the required permits to discharge wastewater. In May 1980, NJDEP issued a Notice of Civil Administrative Penalty Assessment and an Administrative Order to Monitor Devices. The order required the cessation of all wastewater discharge, the installation of monitoring wells, and groundwater sampling. Except for payment of $1,500 and installation of three monitoring wells, Monitor Devices failed to comply with the Administrative Order requirements, particularly the installation of a groundwater recovery and decontamination system. In 1985, Monitor Devices and its president were named in a six-count indictment by a Monmouth County Grand Jury for unlawful release, criminal mischief, and illegal discharge of pollutants in violation of New Jersey Water Pollution Act of 1977. The indictment resulted in a guilty plea and the agreement to pay $100,000 towards the clean-up of the site. The plea agreement was not complied with. In 1988 Monitor Devices went bankrupt and the State of New Jersey decided to take no further action against the company or its president. The business started up again as Intercircuits, Inc., at the Lakewood Industrial Park in Lakewood, New Jersey, in 1988. Intercircuits, Inc., went bankrupt in 1988.

The Monitor Devices site was proposed for inclusion on the National Priorities List (NPL) in April 1985, and formally placed on the NPL on June 1, 1986. NJDEP initiated an RI/FS field investigation; however, after completing a phase of field investigations, NJDEP requested that EPA assume responsibility for the site.

After several phases of soil and groundwater studies, EPA's environmental consultant completed field investigations in 2004, and prepared a RI Report summarizing the results. In August 2005, a FS Report was completed for the site.

The results of the 2005 RI report pertaining to groundwater is discussed below, and formed the basis for the development of the FS report and EPA's Proposed Plan. All of these documents are included in the Administrative Record for the sites.

EPA and NJDEP are still evaluating the soil data to determine if the nature and extent of the soil contamination has been adequately characterized.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

On August 24, 2005, EPA released the Proposed Plan and supporting documentation for the groundwater remedy to the public for comment. EPA made these documents available to the public in the administrative record repositories maintained at the EPA Region II office (290 Broadway, New York, New York 10007), the Wall Public Library (2700 Allaire Road, Wall, New Jersey 07719). EPA published a notice of availability involving these documents in the Asbury Park Press newspaper, and opened a public comment period on the documents from August 24, 2005 to September 23, 2005.

On September. 7, 2004, EPA held a public meeting at the Wall Public Branch Library, to inform local officials and interested citizens about the Superfund process, to review the planned remedial activities at the site, and to respond to any questions from area residents and other attendees.

Responses. to the comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

EPA is addressing groundwater at this site in this first operable unit. EPA and NJDEP are still evaluating the nature and extent of soil contamination that may be associated with the site which will be addressed in a second operable unit remedy.

SUMMARY OF SITE CHARACTERISTICS

Soil

The RI investigated the site for soil contamination. Generally, the RI did not find areas of soil contamination and, particular to this Record of Decision (ROD), did not identify any areas of soil contamination that might act as a source of groundwater contamination. Soil investigations focused around Building 25 and, for reasons discussed below, around Building 62C. The details of the soil investigation performed to date can be found in the RI Report in the administrative record. As previously mentioned, EPA and NJDEP are still evaluating the soil data to determine if the nature and extent of the soil contamination has been adequately characterized.

Site-wide Groundwater Contamination

Groundwater beneath the site flows toward the east with a southeastern component. A topographic ridge (high) occupied by the airport to the west of the site probably acts as a small-scale groundwater divide and shallow groundwater likely flows radially away from the center of this ridge.

The unconfined Kirkwood-Cohansey aquifer, in which site contamination is migrating, is an unconfined unit composed of interbedded sand, silt and gravel. It is approximately 45 to 70 feet thick at the site. Below the Kirkwood-Cohansey, though separated from it by confining layers, is the Englishtown aquifer system.

Wall Township's municipal wells are between 460 and 730 feet deep and draw their water from the Mount Laurel and Englishtown aquifers. Based on groundwater flow towards the east/southeast, a Wall Township public supply well on Route 34 is hydraulically downgradient of the site. However, because it is screened in the deeper Englishtown aquifer and not the Kirkwood-Cohansey, in which site contamination is migrating, this supply well has significant confining layers between its productive interval and the overlying Kirkwood-Cohansey, and is not' within the expected migration path of the contamination. Its is highly unlikely that the Englishtown Aquifer can be impacted by contamination from the site (see Figure 2). The Wall Township Water Department reports no violations in its most recent (2004) annual drinking water quality report, and samples collected from the Route 34 supply well by EPA confirm the absence of VOC contamination in the water supply.

Throughout the groundwater investigation, eight organic compounds exceeded the site-specific groundwater screening criteria; however, of the eight compounds, carbon tetrachloride was only detected in one groundwater sampling round at levels exceeding the site-specific screening criteria, and methylene chloride is believed to be a laboratory contaminant and not associated with the site. The remaining VOCs found were:

- 1,1-Dichloroethylene (1,1-DCE)
- 1,2-dichloroethane (1,2-DCA)
- 1,1,1-trichloroethane (1,1,1-TCA)
- 1,1, 2-TCA
- Trichloroethylene (TCE)
- Tetrachloroethylene (PCE)

In the most recent (2004) sampling events, the highest concentrations of these compounds, TCE at 320 parts per billion (320 ppb) and 1,1-DCE at 470 ppb, were detected in MW-17A, located approximately 175 feet downgradient of Building 62-C. The highest concentration of PCE, 8.2 ppb, was detected in MWD-4S. No organic compounds were detected in wells MW-11S and MW-11D, which are considered site background wells. In addition, no organic compounds were detected in the side-gradient wells AMW-5 and AMW-6.

All semi-volatile organics were detected below the site-specific screening criteria with the exception of bis(2-ethylhexyl)-phthalate, which was detected in one well during one sampling round, and is believed to be a laboratory contaminant. No pesticides or polychlorinated biphenyls were detected in any of the site monitoring wells.

In the 2004 sampling events, nine inorganic analytes exceeded the site-specific groundwater screening criteria, including aluminum, arsenic, cadmium, chromium, hexavalent chromium, copper, iron, manganese, vanadium, cyanide and thallium. Metals contamination is localized to wells near Building 25, and does not indicate any downgradient migration. These metals included chromium at 404 ppb, hexavalent chromium at 190 ppb, and copper at 3,400 ppb.

A VOC plume attributable to the site is approximately 2,800 feet long along its primary axis (from northwest to southeast) from the Monitor Devices building to within 800 feet of the intersection of Route 34 and Hurley Pond Road and approximately 1,500 feet wide. Groundwater screening and monitoring well sample results have shown that the groundwater contaminant plume is descending slightly in elevation as it progresses hydraulically downgradient, indicating the presence of a slight downward vertical gradient. Along the main axis of the plume, the depth of the plume appears to begin approximately 125 feet above mean sea level (msl) near the Monitor Devices building and migrates down to 30-35 feet above msl near Building 62-C, (see Figure 3).

The groundwater flows toward the east, with a slight southern component; however, the groundwater contaminant plume appears to trend in a more southerly direction than would be suggested by the groundwater gradients. This contradiction (between the groundwater flow patterns and the apparent contaminant migration patterns) led EPA to believe that other sources may exist, such as in the area of Building 62-C. Soil sampling around Building 62-C, a maintenance building associated with the airport, did not show a source emanating from that location.

The very high groundwater contaminant concentrations in the area of Building 62-C are either the result of an as-yet-unidentified second release or the result of a slug of groundwater contamination that was discharged during the Monitor Devices operation, and its center has migrated as far as Building 62-C. The high groundwater contamination may indicate a potential secondary source that may have resulted from past airport operations (see Figure 3). The Kirkwood-Cohansey aquifer is composed of interbedded sand, silt and gravel layers, and at approximately 30 to 35 feet above msl in the area of Building 62C a silt and interbedded silty gravel layer is present that was detected during the installation of monitoring wells MW-17C and MW-19C. The presence of discontinuous layers of silts and clays in the aquifer in this same area may also contribute to this contamination pattern.

During the RI, groundwater samples were collected to evaluate the degree to which contamination might be naturally attenuating, through biodegradation or other conditions naturally present in the aquifer. There was little evidence that natural attenuation of the VOC contaminants is occurring at levels that would warrant consideration of "monitored natural attenuation" as a remedial strategy.

Based on groundwater flow towards the east/southeast, the Route 34 public supply well is hydraulically downgradient of the site. However, it is screened in the deeper Englishtown Aquifer System, not the unconfined Kirkwood-Cohansey Aquifer, in which site contamination is migrating. Therefore, the Route 34 public supply well has significant confining layers between its productive interval and the overlying Kirkwood-Cohansey Aquifer and therefore is not within the expected migration path of the contamination. Its is highly unlikely that the Englishtown Aquifer has been impacted by contamination from the site. Samples collected from the Route 34 supply well confirm the absence of VOC contamination in the water supply.

Surface Water and Sediment

A small pond, located at the southeast edge of an airport runway and side-gradient from the area of groundwater contamination, was evaluated for potential surface water or sediment contamination from the site. No VOCs or other organic compounds were detected in the surface water or sediment. Several pesticides not associated with the site were detected in a sediment sample below site-specific screening criteria for the sediment sample. Based on the elevation of the pond, along with surface water and sediment samples taken from it, it does not appear that the groundwater discharges to this body of water.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Site Uses: Building 25, the probable original source of the contamination at the site, is currently used as a storage facility. Zoning in the area includes mixed residential, commercial, and light industrial uses. The site area includes the industrial park that is part of the Monmouth County (Allaire) Airport, and neighboring commercial-use properties on Route 34. Several industrial parks, light industry, and commercial properties are located to the east, along Route 34, and to the north. Commercial and residential properties and undeveloped areas border the airport.

The airport and the industrial park are privately owned; however, Monmouth County has plans to acquire the property and the airport. Acquisition by Monmouth County is not expected to change the land use in the affected area.

Ground and Surface Water Uses: Groundwater underlying the site is considered Class IIA, a source of potable water; however, the Kirkwood-Cohansey aquifer is not currently used as a source of potable water in the area. Residents and businesses are supplied by municipal water. One of Wall Township's municipal wells is hydraulically downgradient of the site (approximately one mile), but it is screened in the deeper Englishtown aquifer system, and does not appear to be threatened by site contamination.

SUMMARY OF SITE RISKS

Risk Assessment

The focus of the human health risk (HHRA) assessment is to evaluate risks from exposure to the contaminated groundwater, surface water and sediment. The sediment and surface water samples were collected from a small on-site pond. The purpose of the risk assessment is to identify potential cancer risks and non-cancer health hazards at the site assuming that no further remedial action is taken. An assessment was performed to evaluate current and future cancer risks and non-cancer health hazards based on the most recent sampling data, which were collected and analyzed in 2004.

A four-step risk assessment process is utilized for assessing site-related cancer risks and non-cancer health hazards for a reasonable maximum exposed individual: Hazard Identification-Identification of Chemicals of Potential Concern, Data Collection and Evaluation, Exposure Assessment, Toxicity Assessment and Risk Characterization. Hazard Identification-Identification of Chemicals of Concern identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence and concentration. Exposure Assessment estimates the magnitude of actual and or potential human exposures, the frequency and duration of these exposures and the exposure pathways. Toxicity Assessment determines the types of adverse health effects (cancer and non-cancer) associated with chemical exposures, and the relationship between the magnitude of exposure and severity of adverse effects. Risk Characterization summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site related cancer risks and non-cancer health hazards and addresses the uncertainties.

Hazard Identification/Identification of Chemicals of Potential Concern

The analytical data report, which included samples taken from 2004, was used to determine the chemicals of potential concern (COPCs) in the groundwater, surface water and sediment. Data used in the risk assessment has met all appropriate QA/QC requirements and is appropriate for use in this risk assessment. The maximum detected concentrations of each chemical were compared to their respective risk-based screening criteria. The criteria used for comparison are the USEPA Region 9 Preliminary Remediation Goals (PRG) table (USEPA, 2004), the New Jersey Department of Environmental Protection Groundwater Quality Standards (NJDEPGWQS), New Jersey Department of Environmental Protection Drinking Water Quality Standard (NJDEPDWQS) and the National . Drinking Water Standards (Maximum Contaminant Levels - MCLs). The PRG values are human health risk based criteria that represent a cancer risk of one in a million and a Hazard Quotient of 1.0. The non-cancer hazard PRGs have been adjusted to 0.1 to take into account potential exposures to multiple chemicals. NJDEPGWQS, NJDEPDWS and MCLs are the highest level of contaminant that is allowed in drinking water. These criteria are promulgated standards that apply to public water systems and are intended to protect human health by limiting the levels of contaminants in drinking water. The chemicals that exceeded their respective screening criteria were retained as COPCs. If a chemical's concentration was detected below the PRG value, then that specific chemical was determined to be at a concentration that is unlikely to cause adverse health effects. Group A carcinogens were also retained for analysis regardless of whether they exceeded the PRG screening or not.

An exposure point concentration (EPC) was calculated, for each chemical exceeding the PRG value. The EPC is the 95 percent Upper Confidence Limit (UCL) on the mean or the maximum detected concentration when the 95 percent UCL exceeds the maximum detected concentration in an environmental medium. The EPC is calculated using Pro-UCL 3.0. If the analytical results indicated a non-detect for a chemical, a value of half of the detection limit was used when calculating the 95 percent UCL for that chemical. The EPC is calculated assuming an RME individual is equally exposed to the media within all portions of the site over the time frame of the risk assessment. Appendix II, Table 1 presents the chemicals of concern for each media evaluated and their respective EPCs.

Exposure Assessment

The Monitor Devices site is zoned and developed for industrial use. The most likely current and future receptors are site workers and trespassers. Current and future site workers may be exposed to contaminants in groundwater. Currently the site workers are not in direct contact with the groundwater since the site is supplied with drinking water from the municipal water supply system. However, chemicals may potentially migrate through the subsurface into buildings through vapor intrusion. Workers may be exposed to site-related contaminants via indoor air. Site workers may also be exposed to surface water and sediment from the onsite pond via incidental ingestion and dermal contact. Although site workers are not in direct contact with groundwater, exposure to contaminants in groundwater via may occur if a well is installed in the future.

Analytical results have shown that the groundwater plume has migrated downgradient from the property boundary. The town zoning designates the surrounding areas for office/research. This designation allows for the development that includes corporate office parks, campuses, hotels and conference centers. The closest residential zone is 3,000 feet east of the site, though there are residents closer than that to the site. While off-site residents are not expected to come in direct contact with site contaminants/these receptors may install private wells in the future that draw on the contaminated water from the site. Future residential adults and children may be exposed to site related contamination in groundwater via ingestion, dermal contact, inhalation of volatiles while showering. Because the groundwater migrates downward as it moves towards the residential area, there is no potential for vapor intrusion due to the presence of noncontaminated water above the contaminated plume.

There are three exposure pathways associated with groundwater exposure to the future residential adult and child: ingestion of drinking water, inhalation of volatiles while showering and dermal absorption while showering.

Since the site is zoned for industrial use, the designation allows for the development of a child daycare center. Future daycare children (ages 0-6) may be exposed to contaminants in groundwater via ingestion if a well is installed on the site in the future.

Appendix II, Table 2 provides the conceptual site model for the risk assessment.

Toxicity Assessment

Toxicity data for the COPCs were obtained from IRIS (Integrated Risk Information System). This EPA consensus database provides cancer and non-cancer toxicity information. In the absence of data from IRIS, Superfund Health Risk Technical Support Center - National Center for Environmental Assessment (STSC-NCEA) was contacted for provisional toxicity data.

Appendix II, Table 3 provides data on the non-cancer health effects for the COPCs. The toxicity values presented are the oral reference dose (RfD) and inhalation reference concentration (RfC) and the associated non-cancer health endpoints for the RfD and RfC for each COPC.

Appendix II, Table 4 provides data on the cancer weight of evidence for COPCs and the associated dose/response information (i.e. cancer slope factors, etc.). The weight of evidence is used to characterize the extent to which the available human epidemiology and animal data indicate that an agent may cause cancer in humans. The weight of evidence for each chemical is categorized into the following groups: (A) Human carcinogen/(B1) Probable Human Carcinogen - Limited Human Data; (B2) Probable Human Carcinogen - Sufficient Animal Data - Inadequate or No Human Data; (C) Possible Human Carcinogen; (D) Not Classifiable as a Human

Carcinogen and (E) Evidence of a chemical is not a carcinogen in humans. In general, cancer slope factors were available for 1,1,-DCE, TCE, PCE, arsenic and carbon tetrachloride.

Risk Characterization

The following section discusses the results of the non-cancer health hazards and the cancer risks assessment for each RME individual. Cancer risk and non-cancer hazards for the exposure pathways are presented in Appendix II, Table 5 and 6.

Cancer Risk - Quantitative

For carcinogens, cancer risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk = GDI * Slf

Where
risk = a unitless probability of an individual's developing cancer
GDI = chronic daily intake averaged over 70 years (mg/kg-day)
Slf = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$

These risks are probabilities that usually are expressed in scientific notation. An excess lifetime cancer risk of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimated has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. The NCP defines the acceptable risk range for site related exposures as one in 10,000 (10^{-4}) to one in a million (10^{-6}). The on-site and off-site cancer risks are summarized by exposure scenario.

On-Site Risks

Site Worker-Current/Future
The total cancer risk (1.9×10^{-4}) is slightly above the NCP's acceptable risk range due to inhalation of TCE from vapor intrusion.

Site Worker - Future
The total cancer risk (3.2×10^{-4}) is above the NCP's acceptable risk range due to inhalation of TCE from vapor intrusion and ingestion of TCE and arsenic in tap water.

Child - Future Day-Care
The total cancer risk (1.5×10^{-4}) is slightly above the NCP's acceptable risk range is due to TCE and arsenic in the tap water.

Off-site Risks

Adult - Residential
The total cancer risk (6×10^{-4}) is above the NCP's acceptable risk range is due to TCE and 1,1-DCE in the tap water.

Child - Residential
The total cancer risk (1×10^{-3}) is above the NCP's acceptable risk range is due to TCE and 1,1-DCE in the tap water.

Non-cancer Hazard - Quantitative

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified time period (i.e. lifetime) with a reference dose (RfD) derived for a similar exposure period. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1.0 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-carcinogenic effects from that chemical are unlikely.

The Hazard Index (HI), is generated by adding the HQs for all chemicals of concern that effect the same target organ or act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI less than 1.0 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI greater than 1.0 indicates that a site related exposure may present a hazard to human health. The HQ is calculated as follows:

Non-Cancer = CDI/RfD

Where GDI = chronic daily intake
RfD = reference dose

GDI and RfD are expressed in the same units and represent the same exposure period (i.e. chronic, subchronic or short-term). On-site and off-site non-cancer summarized below by exposure scenario.

On-site Risk

Site Worker - Current/Future
The sum of the hazard quotients for the site worker is 2, which is slightly above EPA's non-hazard index of 1. The His based on individual health endpoints do not exceed the threshold of 1.

Site Worker - Future
The sum of the hazard quotients for the site worker is 5, which is above EPA's non-hazard index of 1. The His based on individual health endpoints are kidney (4), liver (2), and fetus (2), primarily due to TCE.

Child - Future Day Care
The sum of the hazard quotients for the future child attending daycare is 13, which is above EPA's non-hazard index of 1. The His based on individual health endpoints are kidney (10), liver (10), and fetus (10), primarily due to TCE.

Off-site Risks

Adult - Residential
The sum of the hazard quotients for the residential adult is 8, which is above EPA's non-hazard index of 1. The His based on individual health endpoints are kidney (6), liver (7), and fetus (6) , primarily due to TCE.

Child - Residential
The sum of the hazard quotients for the residential child is 19, which is above EPA's non-hazard index of 1. The His based on individual health endpoints are kidney (15), liver (15), fetus (15), skin (1) and GI tract (2), primarily due to TCE, arsenic and copper.

Uncertainty

It is important to identify the uncertainties associated with the assumptions to place the risk estimates in proper perspective. The primary uncertainties associated with this risk assessment include environmental data analysis, exposure assumptions and toxicity assumptions.

Environmental Data
Uncertainty is always involved in the estimation of chemical concentrations. Errors in the analytical data may stem from errors inherent in sampling and/or laboratory procedures. One of the most effective methods of minimizing procedural or systematic error is to subject the data to a strict quality control review. This quality control review procedure helps to eliminate many laboratory errors. However, even with all the data vigorously validated, it must be realized that error is inherent in all laboratory procedures.

Additional uncertainty is associated with chemicals reported in samples at concentrations below the reported quantitation limits, but still included in the analysis. These values are estimated and may result in the over-estimation or under estimation of risks.

Exposure Parameter Estimation
There are two major areas of uncertainty affecting exposure parameter estimation. The first relates to estimation of EPCs. The second relates to parameter values used to estimate chemical intake (e.g. ingestion rate, exposure frequency).

A large source of uncertainty in this risk assessment is associated with modeling indoor air concentrations from vapor intrusion from groundwater below on-site buildings. Some modeling uncertainty was limited through the use of site-specific information (i.e. depth to groundwater, soil type, building size) in the Johnson and Ettinger vapor intrusion model. Building size was based on the smallest on-site building (i.e. the lowest air volume), which may over-estimate concentrations in larger buildings. Maximum detected concentrations in shallow screening samples were used in the model and assumed to persist throughout the exposure duration of 25 years, which is likely to over-estimate risks because concentrations vary over the area and are expected to decrease over time as the plume attenuates.

The approach used to calculate exposure point concentrations for other media may over-estimate potential exposures and thus risks. In accordance with EPA guidance (1989), when at least 10 samples were collected, the exposure point concentration for a specific chemical in a particular medium was based on the 95 percent UCL on the mean, or the maximum detected concentration, whichever was less. Since the 95 percent UCL can be highly unstable from a mathematical standpoint, and is strongly influenced by the sample size and the variability of the chemical concentrations, the approach to estimating exposure point concentrations can result in the default use of the maximum detected concentration. For most chemicals, the 95 percent UCL did not exceed the maximum detected concentration. Arsenic is the only chemical where the maximum detected concentration was used to quantitatively estimate risks. While use of maximum concentrations for arsenic results in conservative risk estimates for groundwater exposure, the source of uncertainty did not strongly influence the results of the risk assessment for most of the COPCs.

Only one sediment and surface water samples were collected from the small pond on site so the measured concentrations were used to directly estimate risks for the onsite workers exposure. Exposure point concentrations based on a single sample are uncertain and the risks may be over-estimated or under-estimated.

When calculating exposure point concentrations from sampling data, one half the reported detection limits for non-detect samples were included in the calculation of the 95 percent UCL. Any approach dealing with non-detected chemical concentrations is associated with some uncertainty. This is because the non-detect result does not indicate whether the chemical is absent from the medium, present a concentration just above zero or present at a concentration just below the detection limit. For chemicals that were infrequently detected (e.g. several chemicals in groundwater, including TCE and 1,1-DCE), many of the values used to estimate the exposure point concentrations were based on detection limits. However, detection limits for the COPCs were generally toward the lower end of detected concentrations, so the 95 percent UGLs were minimally influenced by the detection limits.

The exposure parameters values used are also uncertain. For example, assumptions were made for the exposure time, frequency and duration of potential chemical exposures as well as for the quantity of material ingested, inhaled or absorbed. In general, assumptions were made based on a reasonable maximum exposure and, in most cases, values were specified by either EPA Region 2 or general EPA guidance documents. In the case of the dermal absorption factor, chemical-specific values based on EPA guidance are not available for the VOCs and most inorganic chemicals. Dermal risk associated with these chemicals cannot be quantitatively evaluated for risk assessment, which introduces some uncertainty in total risk and total hazard estimates.

Toxicity
General uncertainties in toxicity assessment stems from a lack of toxicity data for chemicals of potential concern. In addition, there are uncertainties due to the use of animal studies, calculation of cancer risks based on less than life-time exposure data, and synergistic and antagonistic interactions among chemicals in order to develop toxicity values. There are also uncertainties in extrapolating from animal to human for both carcinogenic and non-carcinogenic effects.

Risk Characterization
There is also uncertainty in assessing the risks associated with a mixture of chemicals. In this assessment, the effects of exposure to each contaminant present has initially been considered separately. However, these substances occur together at the site, and individuals may be exposed to mixtures of the chemicals. Prediction of how these chemicals will interact must be based on an understanding of the mechanisms of such interactions. Individual compounds may interact chemically in the body, yielding a new toxic component or causing different effects at different target organs. Suitable data are not currently available to rigorously characterize the effects of chemical mixtures. Consequently, as recommended by EPA (1989), chemicals present at the site were assumed to act additively, and potential health risks were evaluated by summing excess lifetime cancer risks and calculating hazard indices for non-cancer health effects.

This approach to assessing risk associated with mixtures of chemicals assumes that there are no synergistic or antagonistic interactions among the chemicals and that all chemicals have the same . toxic endpoint and mechanisms of action. To the extent that these assumptions are incorrect, the actual risks could be over-estimated or under-estimated.

Uncertainty was also introduced to the risk characterization, when site-specific background concentrations of COPCs were not considered in the risk calculation, especially for arsenic, a Group A carcinogen. At the Monitor Devices site, for the groundwater estimates, the arsenic background concentration (4.3 ppb) is about 65 percent of the arsenic EPC (6.7 ppb). Consequently, the actual site-specific risk is over-estimated.

As a result of the uncertainties described above, this assessment should not be construed as presenting absolute risks or hazards. Rather, it is a conservative analysis intended to indicate the potential for adverse impacts to occur based on reasonable maximum and central tendency exposures.

Conclusion

Estimated risks to trespassers and to construction workers were well below thresholds of concern for both cancer risks and non-cancer hazards. However, potential risks to current and future workers, future onsite daycare children and offsite residents exceeded thresholds of concern, primarily due to the contamination in the groundwater. Concentrations detected in sediment and surface water were not associated with risks above thresholds of concern.

Based on EPA's HHRA, surface water and sediments (from a small pond on the airport property) do not pose a risk to human health.

Ecological Risks

A four-step process is utilized for assessing site-related ecological risks for a reasonable maximum exposure scenario: *Problem Formulation* - a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study. *Exposure Assessment* - a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations. *Ecological Effects Assessment* - literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors. *Risk Characterization* - measurement or estimation of both current and future adverse effects.

An ecological risk characterization was performed for the Monitor Devices site in 1998 and re-evaluated in 2004. A groundwater evaluation indicated very little potential to adversely affect aquatic life due to the limited possibilities of groundwater reaching the surface. No further consideration of groundwater was warranted in the Ecological Risk Assessment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The following remedial action objectives for contaminated groundwater address the human health risks and environmental concerns at the Monitor Devices site:

- Prevent or minimize potential current and future human exposures including ingestion and dermal contact with groundwater that presents a significant risk to public health and the environment;
- Minimize the potential for off-site migration of contaminated groundwater; and
- Restore the groundwater to drinking water standards within a reasonable time frame.

Residents are currently connected to the municipal water system; however, if contaminated groundwater is used as drinking water in the future, significant health risks would exist. In addition, if the contaminated groundwater were used in industrial processes within the area, significant human health risks may exist. Thus, remedial actions must minimize the potential for human exposure to contaminated groundwater.

Appendix II, Table 7 lists the contaminants of concern found in groundwater at the site, and their respective Cleanup Criteria or Standards, in this case the drinking water standards (MCLs) or Ground Water Quality Criteria (GWQS). Cleanup Criteria were selected that would both reduce the risk associated with exposure to contaminants to an acceptable level and ensure minimal migration of contaminants off the site. The metals chromium, hexavalent chromium and copper were identified as contaminants of potential concern; however, because these metals were not identified as risk drivers and were localized to only one well cluster, EPA is not proposing Cleanup Criteria for these metals. A groundwater monitoring program will be implemented to monitor for these metals. Should monitoring results indicate an increase in metal contamination, EPA would evaluate the need for such remediation.

DESCRIPTION OF ALTERNATIVES

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that each remedial alternative be protective of human health and the environment, be cost-effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery technologies to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility or volume of hazardous substances.

Each groundwater remediation alternative would be coupled with institutional controls to limit the potential exposure of the public to the groundwater contamination until the groundwater is cleaned up. Institutional Controls, such as New Jersey's Classification Exception Area (CEA), typically are restrictions placed to minimize human exposure and continue monitoring to track contaminant migration (i.e., long-term monitoring). Institutional controls are generally used in conjunction with other remedial technologies.

Remedial alternatives for the Monitor Devices site are presented below. The time frames below for construction do not include the time for remedial design or the time to procure contracts.

Alternative 1: No Action

Estimated Capital Cost:	$0
Estimated Annual Operation & Maintenance (O&M) Cost:	$0
Estimated Present Worth Cost:	$0
Estimated Construction Time frame:	None

Regulations governing the Superfund program expect that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to prevent exposure to contaminated groundwater. Institutional controls would not be implemented to restrict future groundwater use.

Alternative 2: Institutional Controls/Long-term Monitoring

Estimated Capital Cost:	$37,000
Estimated Annual O&M Cost:	$71,000
Estimated Present Worth Cost:	$975,000

Alternative 2 relies on institutional controls, such as a classification exception area (CEA), to prevent future use of contaminated groundwater within the boundaries of the site, and a groundwater monitoring program would be established to evaluate the groundwater contamination over time. Under the groundwater monitoring program, groundwater conditions would be monitored periodically (e.g., quarterly, semi-annually or annually)..

Long-term monitoring activities would include periodic groundwater sampling from some of the 47 site monitoring wells and the public supply well downgradient to the contaminant plume for VOC analysis. In addition, groundwater samples would be collected periodically from several monitoring wells for metals analysis. Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment. For costing purposes, it is assumed the alternative would be performed for the 30 years.

Alternative 3 - Groundwater Collection and Treatment

Estimated Capital Cost:	$1,261,000
Estimated Annual O&M Cost:	$314,000
Estimated Present Worth Cost:	$5,400,000

The objective of Alternative 3 is to remediate the contaminated groundwater plume through groundwater pumping and treatment. Treatment of extracted groundwater would involve a combination of filtration and air stripping. Based on the estimated air emissions from the air stripper, vapor phase treatment would not be necessary:

A number of different combinations of groundwater extraction wells and treated water discharge options were evaluated, including discharge to surface water and reinjection (see Feasibility Study Report). For cost-estimating purposes for this ROD, this Alternative assumed a series of extraction wells that would capture the 10 ppb TCE plume, requiring a pumping rate of 280 gallons per minute (280 gpm). Alternative 3 also assumes that treated water would be discharged to a storm water catch basin associated with the airport. The Feasibility Study Report contains a detailed evaluation of the other options of discharging to surface water or through reinjection to groundwater, and any of discharge options could be implemented under this alternative.

This alternative also includes institutional controls such as groundwater use restrictions and periodic groundwater monitoring to track the migration of the plume and to verify the effectiveness of this alternative. It is estimated that this system would be need to be operated for 25 years, and that the groundwater would be restored to drinking water standards in approximately 30 years.

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

Alternative 4: Enhanced Groundwater Bioremediation

Estimated Capital Cost:	$2,510,000
Estimated Annual O&M Cost:	$880,000
Estimated Present Worth Cost;	$7,250,000

This alternative involves enhanced bioremediation for destruction of contaminants, through groundwater extraction followed by the reinjection of water and nutrients or other chemical amendments into the contaminated aquifer. It would be implemented by installing and operating multiple two-well recirculation loops oriented parallel to the direction of groundwater flow. The downgradient well in each loop would be used for groundwater extraction, and the upgradient well would be used for injection of groundwater and bioremediation amendments. The reinjection of amendments with groundwater into the aquifer would encourage *in situ* bioremediation within the aquifer, thereby accelerating the rate of aquifer recovery.

Bioremediation would be implemented by stimulating microbes in the aquifer that would then destroy the. VOCs, through one of two mechanisms, aerobic co-metabolism or enhanced anaerobic bioremediation (EAB). The selection of the bioremediation approach to be implemented would be based on the outcome of bench-scale treatability studies during remedial design. In terms of overall implementation, both bioremediation technologies would be similar with the exception of the actual amendments to be delivered to the subsurface. For aerobic co-metabolism, the amendments would be oxygen and a primary substrate (e.g. methane, propane, butane, or ammonia), while for EAB, the amendment would be an electron donor such as lactate or whey powder.

Treatment of the extracted water may be necessary prior to reinjection in order to satisfy regulatory requirements. It is assumed, for cost-estimating purposes, that treatment would be required and that it would be similar to the technologies discussed in Alternative 3.

The feasibility study evaluated a number of different combinations of groundwater recirculation loops. For cost-estimating purposes, this alternative assumed 16 recirculation loops to capture and treat the 10 ppb plume. The recirculation loops would be operated in a pulse mode in which they would extract, treat, and inject groundwater along with bioremediation amendments periodically. The recirculation loops would only be operated during a bioremediation amendment injection event. While providing some measure of hydraulic control, the goal of the recirculation loops is primarily to introduce and distribute the groundwater amendments that will support bioremediation.

This alternative also includes institutional controls such as groundwater use restrictions and periodic groundwater monitoring to track the migration of the plume and to verify the effectiveness of this alternative. It is estimated that this system would be operated for seven to 10 years to actively restore the aquifer. It is estimated that five to eight years of monitoring would follow after completion of active operations, in order to confirm that the site has been restored.

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA § 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR § 300.430 (e) (9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria.

Threshold Criteria - The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.

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1. **Overall Protection of Human Health and the Environment**

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

The no action alternative is not considered protective because it does nothing to prevent exposure to contaminated groundwater in the future, which would result in unacceptable future risks.

The remaining alternatives are considered protective. Alternative 2 (Institutional Controls and Monitoring) is considered protective because it includes restrictions on the use of groundwater and includes groundwater monitoring to ensure that the plume does not migrate to areas that would result in human exposure. Alternative 2 eliminates human contact. Alternatives 3 and 4 take differing approaches to remediating the groundwater contamination, but are equally protective of human health.

2. **Compliance with applicable or relevant and appropriate requirements (ARARs)**
Section 121 (d) of CERCLA and NCP § 300.430(f)(l)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121 (d)(4).

<u>Applicable requirements</u> are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. <u>Relevant and appropriate requirements</u> are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

The Cleanup Criteria or Standards (see Appendix II, Table 7) are MCLs or groundwater quality standards and, therefore, ARARs. Alternative 1 (No Action) would not meet ARARs. Alternative 2 (Institutional Controls and Monitoring) is not expected to achieve ARARs in a reasonable time frame due to limited natural attenuation (dilution only) at the site. Alternative 3 (groundwater collection and treatment) may not meet the Cleanup Criteria or Standards in the entire aquifer within a 25-year treatment time frame but would substantially reduce contaminant concentrations and achieve ARARs throughout most of the aquifer within 30 years. Alternative 4 (enhanced bioremediation) would likely meet the Cleanup Goals in 15 years.

Alternatives 2 through 4 would require institutional controls, such as a CEA, to control use of the groundwater until groundwater Cleanup Goals can be met.

Because the No Action and Monitoring alternatives (1 and 2) are not expected to meet at least one of the threshold criteria (Protection of Human Health and the Environment and Compliance with ARARs), they were eliminated from consideration under the remaining seven criteria.

A complete analysis of ARARs can be found in the FS Report.

Primary Balancing Criteria - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.

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3. Long-term effectiveness and permanence

A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Alternatives 3 and 4 are considered permanent remedies. The long-term effectiveness of these alternatives would be assessed through routine groundwater monitoring and five-year reviews. Alternative 4 ranks higher than Alternative 3 in long-term effectiveness and permanence since it is estimated to restore the aquifer to the cleanup standards in as little as half the time.

4. Reduction of toxicity, mobility, or volume

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternatives 3 and 4 would reduce the toxicity, mobility or volume of the contaminants in groundwater through extraction and treatment (for Alternative 3) or through enhanced bioremediation in conjunction with pump and treat (for Alternative 4). Alternatives 3 and 4 offer a comparable level of improvement in mobility, toxicity and volume reduction.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers/the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternatives 3 and 4 have minimal impacts with respect to the protection of workers, the community and the environment during remedial construction. Both the active alternatives involve long-term operation of a treatment facility at the site, though the size of the treatment facility is expected to be minimal. Alternative 4 has potential worker or community impacts due to the injection of various reagents into the aquifer, though the primary concern would be in the management of drummed chemicals at the treatment facility.

The short-term effectiveness with respect to the time until the remedial action objectives are achieved is quickest for Alternative 4 (enhanced bioremediation). For Alternative 3, it is expected that MCLs in much of the groundwater could be achieved in approximately 25 years. Alternative 4 will achieve the remedial action objectives faster than Alternative 3, approximately 15 years.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternatives 3 and 4 would be constructed using standard construction equipment and services. The administrative implementability of Alternative 3 (e.g, obtaining a New Jersey Pollutant Discharge Elimination System (NJPDES) permit equivalent for the discharge of treated water) could be time-critical. The administrative implementability of Alternative 4 (e.g, obtaining required permits for injection of bioremediation amendments) would be more difficult and need to be further evaluated, but the alternative is still considered implementable.

The primary technical implementability constraint is reinjection of water, or in the case of Alternative 4, water and amendments to promote bioremediation. Reinjection can be avoided for Alternative 3 by discharging the treated water to local surface water, but reinjection is an integral feature of Alternative 4. A number of technical challenges, including well fouling and short-circuiting, are associated with reintroducing water into an aquifer. These challenges can be managed but raise the level of involvement required during operation and maintenance of the system.

7. Cost

Includes estimated capital and O&M costs, and net present worth value of capital and O&M costs.

Alternative	Cost
1	$0
2	$975,000
3	$5,400,000
4	$7,250,000

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.

8. State acceptance

Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure.

The State of New Jersey concurs with EPA's Selected Remedy.

9. Community acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial response measures proposed for the sites. Oral comments were recorded from attendees of the public meeting. No written comments were received from the public. The community was generally supportive of EPA's Proposed Plan. Appendix V, The Responsiveness Summary, addresses the oral comments received at the public meeting.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1) (iii) (A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat Wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Results from the soil sampling did not identify any "principal threat wastes" that might be acting as a continuing source of either VOC or metals contamination to the groundwater, at the site. EPA and NJDEP are still evaluating the soil data to determine if the nature and extent of the soil contamination has been adequately characterized.

SELECTED REMEDY

Based upon consideration of the results of the site investigation, the requirements of CERCLA, the detailed analysis of the response measures, and public comments, EPA has determined that Alternative 4 is the appropriate remedy for addressing the groundwater contamination at the Monitor Devices site, as it satisfies the requirements of CERCLA § 121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR § 300.430(e)(9). Alternative 4 is comprised of the following components:

- *In situ* treatment of VOC contaminants in the groundwater through enhanced bioremediation;

- Establishing groundwater recirculation loops, as necessary, involving extraction of contaminated groundwater within the 10 ppb portion of the plume, followed by on-site reinjection of groundwater and amendments, to support *in situ* bioremediation;

- Long-term monitoring; and

- Institutional controls, such as the implementation of a Classification Exemption Area to restrict the use of groundwater within the area.

EPA's selected Alternative 4 over the other alternatives because it is expected to achieve substantial and long-term risk reduction through treatment of the groundwater, and is expected to eventually allow for the unrestricted use of the groundwater. The Selected Remedy reduces the risk within a reasonable time frame, and at a cost comparable to the other alternatives.

While the recirculation loop system described in Alternative 4 is likely to provide a measure of hydraulic control on the plume, the primary purpose of the extraction and reinjection system is to speed the distribution of bioremediation amendments in the aquifer, not to maintain active hydraulic control of the contaminant plume. If, during remedial design, other mechanisms for introducing and distributing the amendments within the aquifer are identified, the implemented remedial action need not contain a recirculation step.

Treatment of extracted water prior to groundwater reinjection may prove necessary to satisfy a permit condition. Treatment of extracted water prior to discharge is not a remedial component.

The Selected Remedy, Alternative 4, is believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA § 121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA § 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4).

Protection of Human Health and the Environment

The Selected Remedy, will be protective of human health and the environment by treating contaminants in the ground water. Organic contaminants will be degraded *in situ* through enhanced bioremediation, approximately in the zone of the 10 ppb VOC plume. It is expected that the groundwater would meet the Cleanup Standards within 15 years.

Preliminary data evaluation predicts that this alternative will require approximately seven years of active operations in order to meet the Cleanup Standards. Long-term monitoring will be implemented following active operations in order to monitor the groundwater quality to ensure that contaminants remain below cleanup standards. In addition, institutional controls will be implemented to prevent exposure to contaminated groundwater during remediation.

Compliance with ARARs

Contaminant concentrations in the groundwater are expected to decrease over time. It is anticipated that the Cleanup Standards will be met within 15 years. Long-term groundwater monitoring would be conducted to assess the degree of compliance achieved over time.

A Stage IA Cultural Resources Survey was conducted for the site and some portions of the project area have a high sensitivity for the potential discovery of prehistoric archaeological sites. A Stage IB Cultural Resources survey will be conducted during the design phase to insure that the Selected Remedy does not impact these areas.

The selected remedy will meet action-specific ARARs. NJDEP and/or local permit equivalencies will potentially be required for well installation, general construction, discharge of extracted water to groundwater with or without treatment, and off-gas discharge to ambient air (related to groundwater treatment. A complete analysis of ARARs can be found in the FS Report.

Cost Effectiveness

In the lead agency's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP § 300.430(f) (1) (ii) (D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. EPA determined that the overall effectiveness of Alternative 4 was substantially greater than Alternative 3, even though it is projected to be more the more costly of the two ($7.25 million compared to $5.4 million for Alternative 3). EPA believes that Alternative 4 represents a reasonable value for the money to be spent.

For a detailed cost summary of Alternative 4, see Appendix II, Table 8, of this document.

Long-term Effectiveness and Permanence

The Selected Remedy provides long-term effectiveness and permanence for the contaminated groundwater at the site. The operation of the enhanced bioremediation treatment system will restore the aquifer to the cleanup levels by destroying contaminants *in situ*. Groundwater monitoring will be implemented to monitor the groundwater quality both during and after the period of active remediation.

The Selected Remedy will provide adequate control of risk to human health, as no exposures to groundwater are expected. The *in situ* bioremediation system should effectively treat the contaminated plume using technologies that have been successfully demonstrated at similar sites.

The long-term effectiveness of the Selected Remedy will be assessed through routine groundwater monitoring and five-year reviews.

Preference for Treatment as a Principal Element

The Selected Remedy meets EPA's statutory preference for the use of remedies that involve treatment as a principal element. The toxicity, mobility, and volume of the contaminants in the groundwater would be reduced primarily by *in-situ* biodegradation, and secondarily by the pump and treat system. The transformation of contaminants to innocuous byproducts meets EPA's policy preference for destructive technologies over those that merely transfer contaminants to another media.

Short-term Effectiveness

Although a fairly significant amount of site work would be required for this alternative, this type of construction is routine, as installation of the recirculation wells, groundwater treatment systems, and bioremediation amendment injection systems are common. Therefore, the work will be performed without significant risk to the community.

A seven to 10-year duration was assumed for O&M of the active groundwater recirculation and bioremediation amendment activities. An additional five to eight year duration was assumed for long-term groundwater monitoring to assure that remediation goals will be achieved.

Implementability

The Selected Remedy is technically and administratively implementable. The Selected Remedy will be constructed and implemented using conventional construction methods and equipment. The technical feasibility of enhanced bioremediation has been established at numerous other sites. Despite this, bioremediation is still considered an innovative technology. As such, EPA will conduct bench-scale testing prior to implementation of the Selected Remedy. However, the processes that govern degradation reactions are well understood and therefore, no significant technical difficulties are anticipated.

In addition, no technical difficulties are anticipated for installation and operation of the groundwater extraction and treatment system (if needed). Services and materials for implementation of the Selected Remedy are readily available.

Five-Year Review Requirements

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but may take more than five years to attain the remedial action objectives and cleanup levels for the groundwater, a policy review may be conducted within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

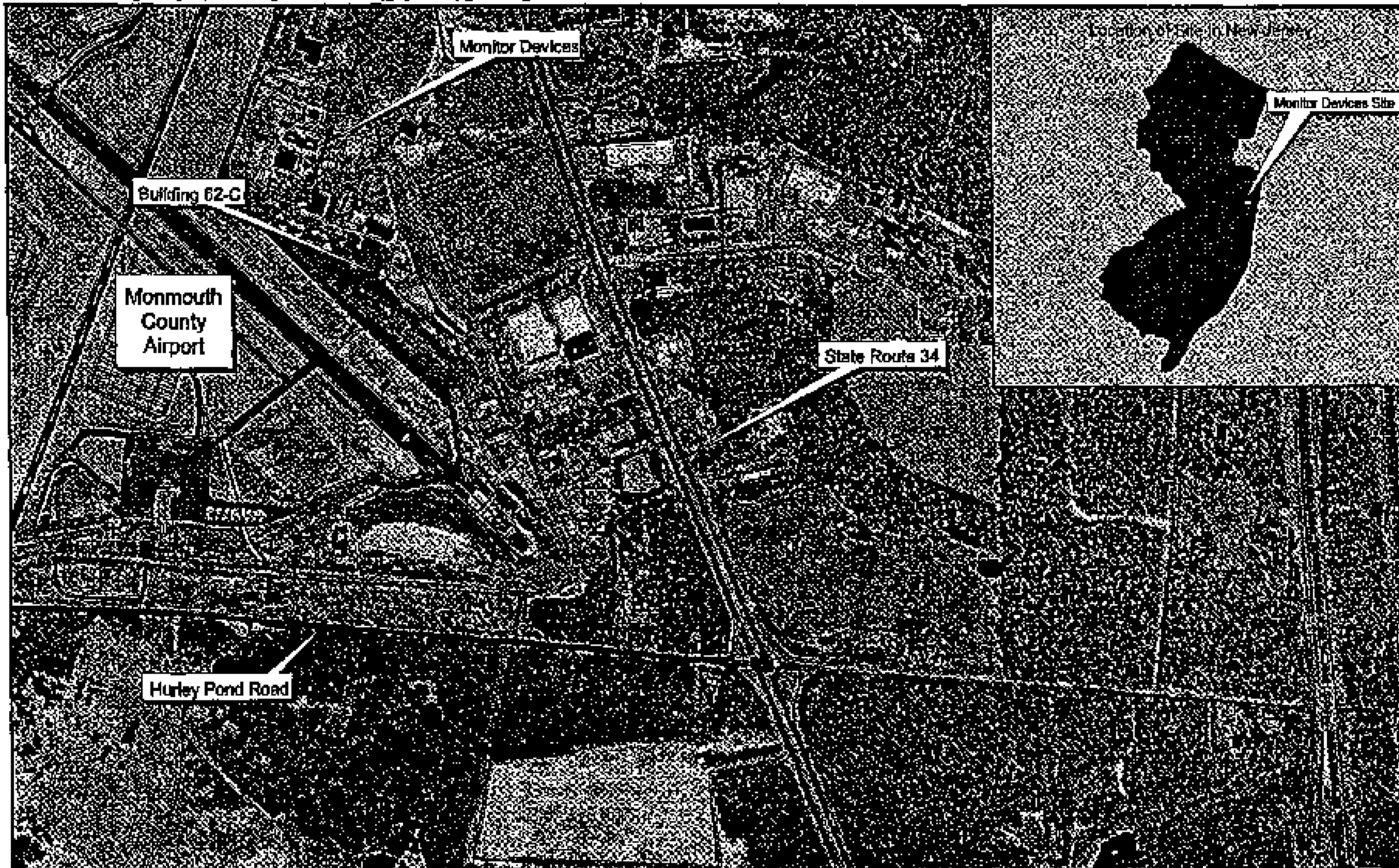
DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Monitor Devices sites was released for public comment on August 24, 2005. The comment period closed on September 23, 2004.

The. Proposed. Plan identified Alternative 4, as the preferred alternative to address groundwater contamination at the site. Upon review of all comments submitted, EPA determined that no significant changes to the Selected Remedy, as it was presented in the Proposed Plan.

APPENDIX I

FIGURES



LEGEND

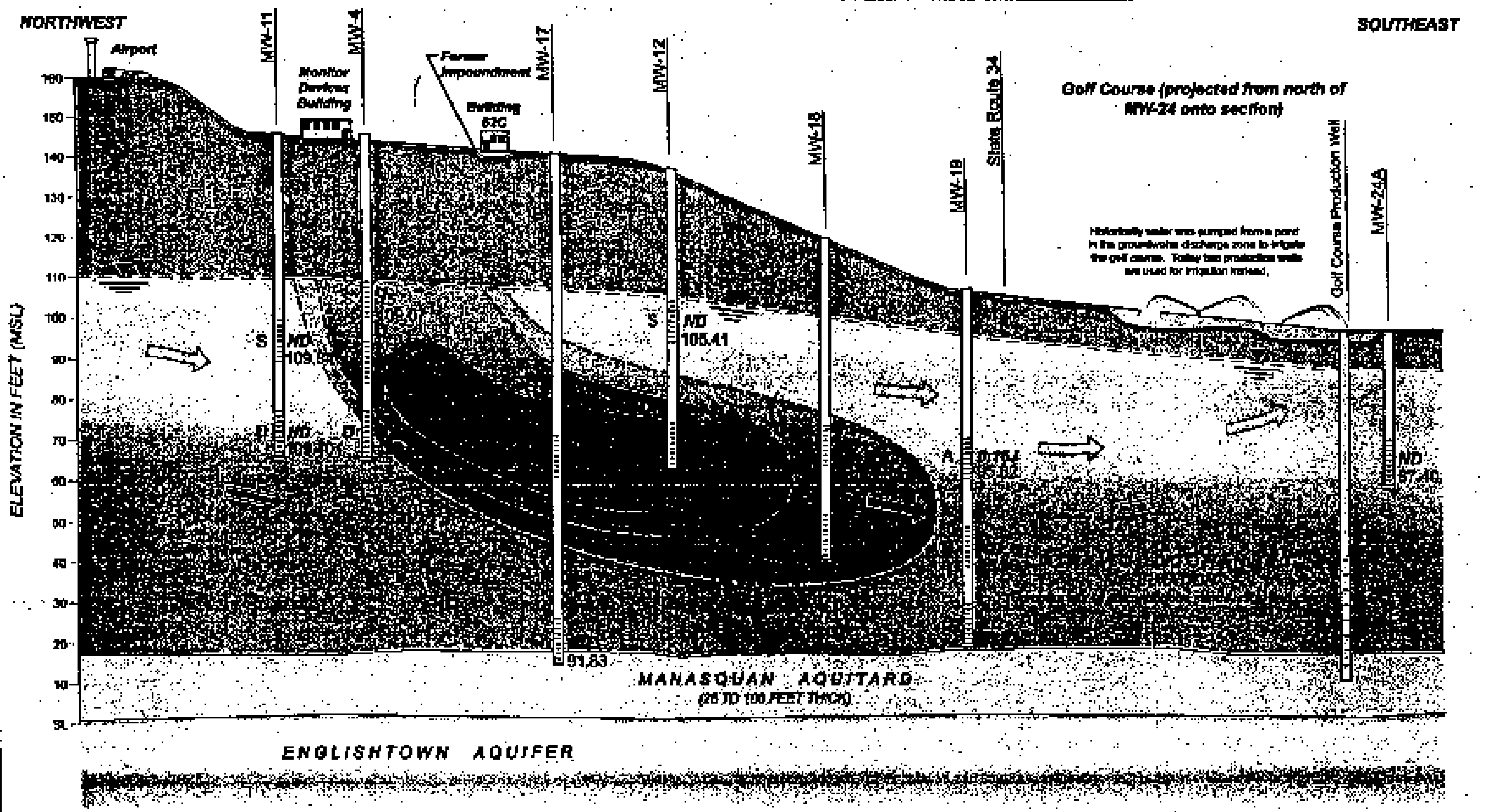
- Monitor Devices
- Property Boundaries
- Roads
- Airport
- Buildings

N

0 700 Feet

Figure 1
Site Location Map
Monitor Devices Site
Wall Township, New Jersey

CDM



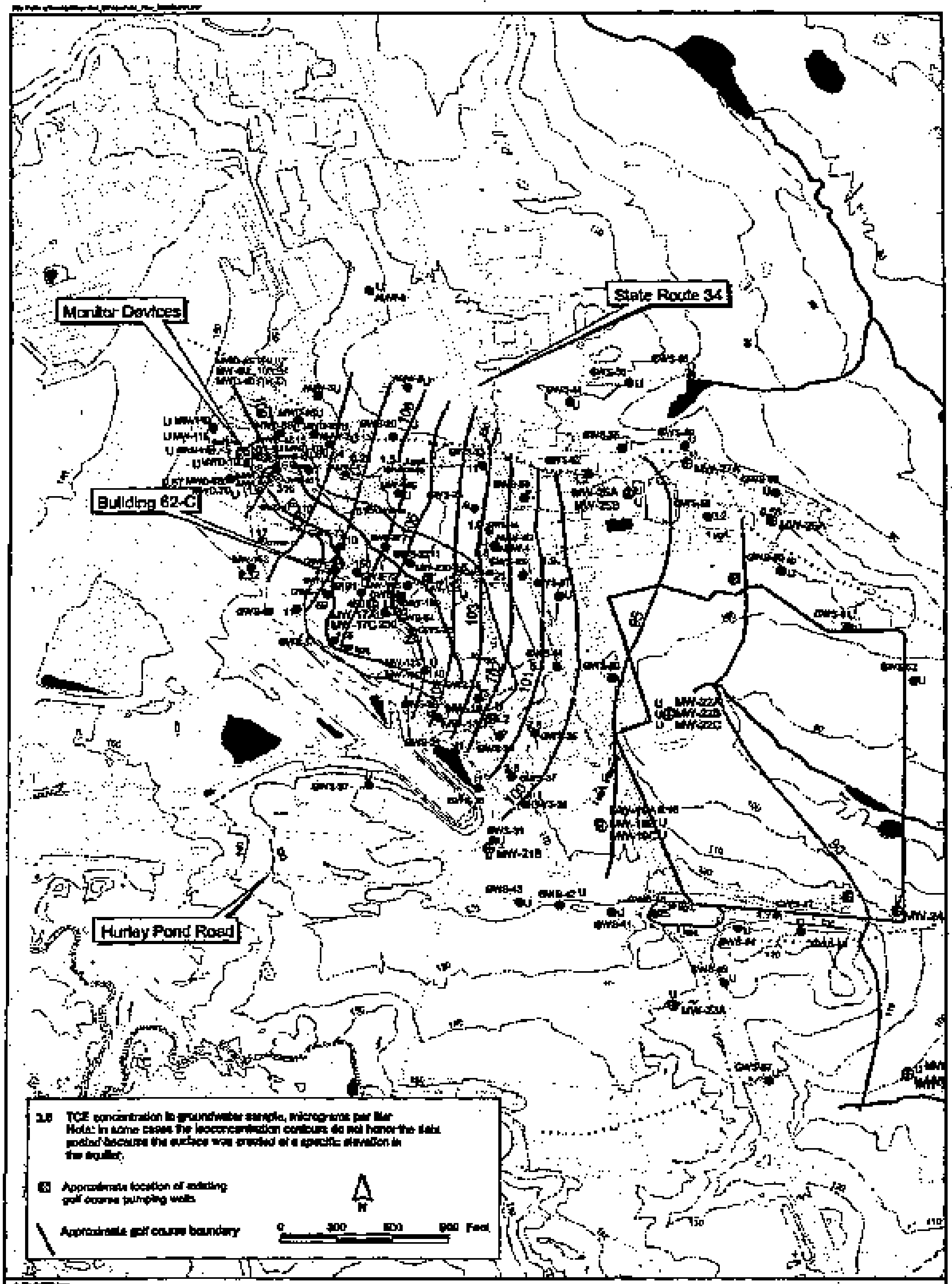
LEGEND

Top of Water Table		ND	Non-Detect
Groundwater flow Direction		—— 10 ——	TCE Contours (ug/L)
0.64	Trichloroethene (TCE) concentration, March 2004, micrograms per liter (ug/L)	109.84	Water level elevation (feet msl) March 2004

Notes:
1. The upward hydraulic gradient depicted in conceptual model is based on Conditions to the north of monitoring well MW-19 cluster and monitoring well MW-24
2. The construction details of the golf course production well are assumed.
3. Drawing Not to Scale

Figure 2
Conceptual Site Model
Monitor Devices Site
Wall Township, New Jersey

CDM



LEGEND

- Surface water drainage divides, estimated
- TCE isoconcentration contour, 1 ug/L
- TCE isoconcentration contour, 1 ug/L inferred
- TCE isoconcentration contour, 10 ug/L
- TCE isoconcentration contour, 100 ug/L
- Potentiometric Surface, March 8, 2004, 75 to 100 foot elevation
- GWSI Phase I Groundwater Screening Locations, 1997-1998
- Phase II GW Screening Locations
- Phase III GW Screening Locations
- Existing well locations
- Monitoring Wells, installed in 2004
- Streams
- Surface Water Bodies
- Monitor Devices
- Topographic contour, dashed where obscured

Figure 3
Potentiometric Surface and TCE Data
75 to 100 Foot Elevation, March 2004
Monitor Devices Site
Wall Township, New Jersey

CDM

APPENDIX II

TABLES

TABLE 1

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistic
		Min	Max					
Groundwater	1,1-DCE	1.6	355	ug/l	8/46	85	ug/l	99% Chebyshev
	Carbon Tetrachloride	0.29	8.745	ug/l	7/46	1.4	ug/l	95% Chebyshev
	PCE	0.17	8.2	ug/l	12/46	1.8	ug/l	95% Chebyshev
	TCE	0.16	235	ug/l	16/46	67	ug/l	99% Chebyshev
	Arsenic	2.6	6.7	ug/l	7/46	7	ug/l	Mod-T UCL
	Copper	1.3	2570	ug/l	17/46	690	ug/l	99% Chebyshev

Key

ug/l: microgram/liter
95% Chebyshev: 95% Upper Confidence Limit - Chebyshev Statistic
99% Chebyshev: 99% Upper Confidence Limit - Chebyshev Statistic
Mod-T UCL: Modified -T 95% Upper Confidence Limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of concern (COPCs) and exposure point concentration (EPC) for each of the COPCs detected above their respective Region 9 Preliminary Remediation Goals (PRG). The PRG screening levels are equivalent to a cancer risk of 1×10^{-6} or an HI = 0.1. The EPC was calculated using Pro-UCL, Version 2.0 for the majority of the COPCs. The EPC was used to calculate the human health risk and hazard through exposure pathways identified in the risk assessment. The table includes the range of concentrations detected for each COPC, as well as the frequency of detection, the exposure point concentration (EPC), and how the EPC was derived (i.e. statistic).

TABLE 1 cont.

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistic
		Min	Max					
Sediment	Arsenic	1.3	1.3	mg/kg	1/1	1.3	mg/kg	maximum detected concentration

Key

ug/l: microgram/liter
mg/kg: milligram/kilogram

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of concern (COPCs) and exposure point concentration (EPC) for each of the COPCs detected above their respective Region 9 Preliminary Remediation Goals (PRG). The PRG screening levels are equivalent to a cancer risk of 1×10^{-6} or an HI = 0.1. The EPC was calculated using Pro-UCL, Version 2.0 for the majority of the COPCs. The maximum detected concentration was used as the EPC if less than 10 samples were collected from the media of concern. The EPC was used to calculate the human health risk and hazard through exposure pathways identified in the risk assessment. The table includes the range of concentrations detected for each COPC, as well as the frequency of detection, the exposure point concentration (EPC), and how the EPC was derived (i.e. statistic).

TABLE 2

SELECTION OF EXPOSURE PATHWAYS

MONITOR DEVICES

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Monitor Devices Property	Site Worker	Adult >18 years old	Ingestion	Quantitative	Workers may incidentally ingest soil
						Dermal	Quantitative	Workers may have exposed skin surfaces contact soil
				Trespasser	Adolescent (12-18 years old)	Ingestion	Quantitative	Trespassers may incidentally ingest soil
						Dermal	Quantitative	Trespassers may have exposed skin surfaces come into contact with soil
		Outdoor Air	*Monitor Devices Property*	*Site Worker*	Adult >18 years old	*Inhalation*	*Quantitative*	*Workers may inhale fugitive dust*
				Trespasser	Adolescent (12-18 years old)	Inhalation	Quantitative	Trespassers may inhale fugitive dust
	Groundwater	*Indoor Air*	Monitor Devices Property (vapor intrusion from subsurface)	*Site Worker*	Adult >18 years old	*Inhalation*	*Quantitative*	Workers may inhale volatiles that migrate from the subsurface to indoor air
	Sediment	Sediment	Monitor Devices Property	Site Worker	Adult >18 years old	Ingestion	Quantitative	Workers may incidentally ingest sediment
						Dermal	Quantitative	*Workers may have exposed skin surfaces contact sediment*
	Surface Water	Surface Water	Monitor Device Property	Site Worker	Adult >18 years old	Ingestion	Quantitative	Workers may incidentally ingest surface water
						Dermal	Quantitative	*Workers may have exposed skin surfaces contact surface water*
Future	Surface/Subsurface Soil	Surface/Subsurface Soil	Monitor Devices Property	Construction Worker	Adult >18 years old	Ingestion	Quantitative	Workers may incidentally ingest soil
						Dermal	Quantitative	Workers may have exposed skin surfaces come into contact with soil
		Outdoor Air	Monitor Devices Property	Construction Worker	Adult >18 years old	Inhalation	Quantitative	Workers may inhale fugitive dust
	Surface Soil	Surface Soil	Monitor Devices Property	Daycare Child	Child (0-6 years old)	Ingestion	Quantitative	Children at future on-site daycare center may incidentally ingest soil
						Dermal	Quantitative	Children at future on-site daycare center may have exposed skin contact soil
		Outdoor Air	Monitor Devices Property	Daycare Child	Child (0-6 years old)	Inhalation	Quantitative	Children at future on-site daycare center may inhale fugitive dust
	Groundwater	Groundwater	Tap Water	Site Worker	Adult >18 years old	Ingestion	Quantitative	Aquifer is designated as potable water supply; therefore, workers may be exposed in the future to site-related contaminants
				Daycare Child	Child (0-6 years old)	Ingestion	Quantitative	Aquifer is designated as potable water supply; therefore, daycare center children may be exposed in the future to site-related contaminants
				Offsite Resident	Adult >18 years old	Ingestion	Quantitative	Aquifer is designated as potable water supply; therefore, residents may be exposed in the future to site-related contaminants
						Dermal	Quantitative	Aquifer is designated as potable water supply; therefore, residents may be exposed in the future to site-related contaminants
					Child (0-6 years old)	Ingestion	Quantitative	Aquifer is designated as potable water supply; therefore, residents may be exposed in the future to site-related contaminants
						Dermal	Quantitative	Aquifer is designated as potable water supply; therefore, residents may be exposed in the future to site-related contaminants
			Water Vapors in Bathroom	Offsite Resident	Adult >18 years old	Inhalation	Quantitative	Aquifer is designated as potable water supply; therefore, residents may be exposed in the future to site-related contaminants
			Household Air (vapor intrusion from subsurface)	Offsite Resident	Adult >18 years old	Inhalation	NONE	The contaminant plume migrates downward as it approaches the residential area. The presence of noncontaminated water above the plume removes the potential for exposure.
					Child (0-6 years old)	Inhalation	NONE	The contaminant plume migrates downward as it approaches the residential area. The presence of noncontaminated water above the plume removes the potential for exposure.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (for Dermal)	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
1,1-DCE	Chronic	5.0E-2	mg/kg-day		5.0E-2	mg/kg-day	Liver	100	IRIS	8/19/04
Carbon Tetrachloride	Chronic	7.0E-4	mg/kg-day		7.0E-4	mg/kg-day	Liver	1000	IRIS	8/19/04
Isopropylbenzene	Chronic	1.0E-1	mg/kg-day		1.0E-1	mg/kg-day	Kidney	1000	IRIS	8/19/04
PCE	Chronic	1.0E-2	mg/kg-day		1.0E-2	mg/kg-day	Liver	1000	IRIS	8/19/04
TCE	Chronic	3.0E-4	mg/kg-day		3.0E-4	mg/kg-day	Liver/Kidney/Fetus	3000	NCEA	10/25/04
Arsenic	Chronic	3.0E-4	mg/kg-day	95%	2.9E-4	mg/kg-day	Skin	3	IRIS	8/19/04
Copper	Chronic	4.0E-2	mg/kg-day		4.0E-2	mg/kg-day	GI Tract	1000	NCEA	10/25/004

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
1,1-DCE	Chronic	2.0E-1	mg/cu. m	5.7E-2	mg/kg-day	Liver	30	IRIS	8/19/04
Carbon Tetrachloride	NA	NA	NA	NA	NA	NA	NA	IRIS	8/19/04
Isopropylbenzene	Chronic	4.0E-1	mg/cu. m	1.1E-1	mg/kg-day	Kidney	1000	IRIS	8/19/04
PCE	Chronic	6.0E-1	mg/cu. m	1.7E-1	mg/kg-day	Kidney	30	NCEA	10/25/04
TCE	Chronic	4.0E-2	mg/cu. m	1.1E-2	mg/kg-day	CNS	1000	NCEA	10/25/04
Arsenic	NA	NA	NA	NA	NA	NA	NA	IRIS/HEAST	8/19/04
Copper	NA	NA	NA	NA	NA	NA	NA	IRIS/ HEAST	8/19/04

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
HEAST: Health Effects Assessment Summary Tables, U.S. EPA
NCEA: National Center for Environmental Assessment, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater and soil. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,1-DCE	NA	NA	NA	NA	C	IRIS	8/19/04
Carbon Tetrachloride	1.3E-1	$(mg/kg\text{-}day)^{-1}$	1.3E-1	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	8/19/04
Isopropylbenzene	NA	NA	NA	NA	D	IRIS	8/19/04
PCE	5.4E-1	$(mg/kg\text{-}day)^{-1}$	5.4E-1	$(mg/kg\text{-}day)^{-1}$	C	CalEPA	10/25/04
TCE	4.0E-1	$(mg/kg\text{-}day)^{-1}$	4.0E-1	$(mg/kg\text{-}day)^{-1}$	B1	NCEA	10/25/04
Arsenic	1.5E0	$(mg/kg\text{-}day)^{-1}$	1.5E0	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/19/04
Copper	NA	NA	NA	NA	D	IRIS	8/19/04

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,1-DCE	3.4E-4	$(ug/cu.\ m.)^{-1}$	1.2E0	$(mg/kg/day)^{-1}$	C	HEAST/IRIS	7/1/97
Carbon Tetrachloride	1.5E-5	$(ug/cu.\ m.)^{-1}$	5.3E-2	$(mg/kg/day)^{-1}$	B2	IRIS	8/19/04
Isopropylbenzene	NA	NA	NA	NA	D	IRIS	8/19/04
PCE	5.9E-6	$(ug/cu.\ m.)^{-1}$	2.1E-2	$(mg/kg/day)^{-1}$	C	CalEPA	10/25/04
TCE	1.1E-4	$(ug/cu.\ m.)^{-1}$	4.0E-1	$(mg/kg/day)^{-1}$	B1	NCEA	10/25/04
Arsenic	4.3E-3	$(ug/cu.\ m.)^{-1}$	1.5E+1	$(mg/kg/day)^{-1}$	A	IRIS	8/19/04
Copper	NA	NA	NA	NA	D	IRIS	8/19/04

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
NCEA: National Center for Environmental Assessment
HEAST: Health Effects Assessment Summary Tables
CalEPA: California Environmental Protection Agency

A - Human carcinogen
B1 - Probable Human Carcinogen - Indicates that limited human data are available
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater and soils. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Page 1

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (vapor intrusion)	Monitor Devices	PCE	NA	1.6E-6	NA	1.6E-6
			TCE	NA	1.9E-4	NA	1.9E-4
						Total Risk =	1.9E-4

TABLE 5

Page 2

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (vapor Intrusion)	Monitor Devices	PCE	NA	1.6E-6	NA	1.6E-6
			TCE	NA	1.9E-4	NA	1.9E-4
						Total Risk =	1.9E-4
Groundwater	Groundwater	Tap Water	PCE	3.3E-6	NA	NA	3.3E-6
			TCE	9.4E-5	NA	NA	9.4E-5
			Arsenic	3.5E-5	NA	NA	3.5E-5
						Total Risk =	1.3E-4

TABLE 5

Page 3

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Daycare
Receptor Age: Child (0-6 years old)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	TCE	1.0E-4	NA	NA	1.0E-4
			Arsenic	3.9E-5	NA	NA	3.9E-5
						Total Risk =	1.5E-4

TABLE 5

Page 4

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	1,1-DCE	NA	1.8E-4	NA	1.8E-4
			Carbon tetrachloride	1.7E-6	9.8E-8	6.2E-8	1.9E-6
			PCE	9.0E-6	4.7E-8	6.7E-7	9.7E-6
			TCE	2.5E-4	3.6E-5	6.8E-6	2.9E-4
			Arsenic	9.4E-5	NA	2.1E-7	9.5E-5
						Total Risk =	5.9E-4

TABLE 6

Page 1

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Current/Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (vapor intrusion)	Monitor Devices	Isopropylbenzene	Kidney	NA	1.3	NA	1.3
							Exposure Medium Hazard Index Total =	1.6

ORGAN SPECIFIC HI

Endpoint	Total HI
Kidney	1

TABLE 6

Page 2

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (vapor intrusion)	Monitor Devices	Isopropylbenzene	Kidney	NA	1.3	NA	1.3
							Exposure Medium Hazard Index Total =	1.6

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	TCE	Liver/Kidney/Fetus	2.2	NA	NA	2.2
							Exposure Medium Hazard Index Total =	2.8

ORGAN SPECIFIC HI

Endpoint	Total HI
Kidney	4
Liver	2
Fetus	2

TABLE 6

Page 3

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Site Daycare
Receptor Age: Child (0-6 years old)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	TCE	Liver/Kidney/Fetus	10.2	NA	NA	10.2
			Arsenic	Skin	1	NA	NA	1
Exposure Medium Hazard Index Total =								13.1

ORGAN SPECIFIC HI

Endpoint	Total HI
Kidney	10
Liver	10
Fetus	10
Skin	1

TABLE 6

Page 4

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap water	TCE	Kidney/Liver/Fetus	6.1	0.024	0.17	6.3
							Exposure Medium Hazard Index Total =	8.1

ORGAN SPECIFIC HI

Endpoint	Total HI
Kidney	6
Liver	7
Fetus	6

TABLE 6

Page 5

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-6 years old)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap water	TCE	Kidney/Liver/Fetus	14	0.34	0.51	15.1
			Arsenic	Skin	1.4	NA	0.0045	1.4
			Copper	GI Tract	1.1	NA	0.0033	1.1
							Exposure Medium Hazard Index Total =	19.5

ORGAN SPECIFIC HI

Endpoint	Total HI
Kidney	15
Liver	15
Fetus	15
Skin	1
GI Tract	2

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

TABLE - 7

CONTAMINANTS OF CONCERN
IN
GROUNDWATER

Contaminants	**Highest Concentration (Parts per billion)**	**Ground water cleanup levels/goal (Parts per billion)***
1,1-Dichloroethylene (1,1-DCE)	470	2
1,2-Dichloroethane (1,2-DCA)	8.8	2
1,1,1-Trichloroethane (1,1,1-TCA)	210	30
1,1,2-Trichloroethane (1,1,2-TCA)	7.3	3
Tetrachloroethylene (PCE)	8.2	1
Trichloroethylene (TCE)	320	1

* - New Jersey Department of Environmental Protection Groundwater Quality Criteria.

Table 8

Alternative 4: Enhanced Bioremediation - Cost Estimate Summary
Monitor Devices Superfund Site

Item No.	Item Description	Quantity	Unit Cost	Unit	Option A	Option B
CAPITAL COSTS						
Construction Costs						
1.	Civil Survey	1	$ 10,000	LS	$ 10,000	$ 10,000
2.	Work Plans for Bioremediation	1	$ 39,000	LS	$ 39,000	$ 39,000
3.	Mobilization/Demobilization	1	$ 36,000	LS	$ 36,000	$ 36,000
4.	Bioremediation System	1	(see detail)	LS	$ 244,251	$ 367,900
5.	Groundwater Pump and Treat Systems	1	(see detail)	LS	$ 720,409	$ 956,339
6.	Construction Management	1	10% of con.	LS	$ 72,041	$ 95,634
	Subtotal Construction Costs				**$ 1,121,701**	**$ 1,504,872**
	General Contractor Fee (15% construction)				$ 168,255	$ 225,731
	Design Engineering (20% construction)				$ 224,340	$ 300,974
	Resident Engineering/Inspection (10% construction)				$ 112,170	$ 150,487
	Contingency (20%)				$ 224,340	$ 300,974
7.	Bench-Scale treatability study	1	$ 50,000	LS	$ 50,000	$ 50,000
8.	Bioaugmentation	1	$ 20,000	LS	$ 20,000	$ 20,000
9.	Groundwater Use Restriction (CEA)	1	$7,200	LS	$ 7,200	$ 7,200
10.	Baseline Sampling	1	$ 71,364	LS	$ 71,364	$ 71,364
	TOTAL CAPITAL COSTS				**$ 1,999,371**	**$ 2,631,603**
OPERATION & MAINTENANCE (O&M) COSTS						
Annual O&M Costs						
11.	Groundwater (GW) Treatment Plant O&M	1	$ 252,382	YR	$ 252,382	$ 252,382
12.	Bioremediation System O&M	1	(see detail)	LS	$ 150,370	$ 192,610
13.	Monthly Performance Monitoring - Year 1	12	(see detail)	MO	$ 226,326	$ 279,570
14.	*Quarterly Performance Monitoring - Years 2-5*	*4*	*(see detail)*	YR	$ 75,442	$ 93,190
15.	Long-term Monitoring (Annual GW Sampling)	1	$ 71,364	LS	$ 71,364	$ 71,364
	TOTAL ANNUAL O&M COSTS				**$ 775,884**	**$ 889,116**
Unique Long-term O&M Costs						
16.	Final Report (at Year 5)	1	$ 36,960	LS	$ 36,960	$ 36,960
PRESENT WORTH OF COSTS						
17.	Total Capital Costs				$ 1,999,371	$ 2,631,603
18.	GW Treatment System O&M Costs (Option A 7 yrs, Option B 10 yrs)				$ 1,360,161	$ 1,772,629
19.	Bioremediation O&M Costs (Option A 7 yrs, Option B 10 yrs)				$ 810,389	$ 1,352,816
20.	Monthly Performance Monitoring (1 year duration)				$ 211,524	$ 261,286
21.	Quarterly Performance Monitoring (Option A yrs 2-7, Option B yrs 2-10)				$ 336,077	$ 567,444
22.	Long-term Monitoring (15 year duration)				$ 649,976	$ 649,976
23.	Final Report (Option A at Year 7, Option B and Year 10)				$ 23,015	$ 18,787
	TOTAL PRESENT WORTH OF COSTS				**$ 5,390,513**	**$ 7,254,540**

Option A: Treatment of 100 ppb plume with 10 recirculation loops - 7 years of treatment, 15 years total of monitoring
Option B: Treament of 10 ppb plume with 16 recirculation loops - 10 years of treatment, 15 total years of monitoring

APPENDIX III

ADMINISTRATIVE RECORD INDEX

MONITOR DEVICES SUPERFUND SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 300001 - 300020 Letter to Mr. Nigel Robinson, U.S. Environmental Protection Agency, from Mr. Thomas Mathew, P. E., COM Federal Programs Corporation, re: Proposed Screening Level Criteria. Monitor Devices Superfund Site. Remedial Investigation/Feasibility Study, Wall Township, New Jersey. May 17, 2004..

3.3 Work Plans

P. 300021 - 300160 Report: Remedial Investigation/Feasibility Study Phase IIB. Monitor Devices Site, Wall Township, New Jersey, Draft Work Plan, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, December 8, 1994.

P. 300161 - 300499 Report: Final Quality Assurance Project Plan. Monitor Devices Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey. prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, March 9, 2001.

P. 300500 - 300618 Report: Final Health and Safety Plan. Monitor Devices Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, March 9, 2001.

P. 300619 - 300703 Report: Quality Assurance Project Plan Addendum No. 2, Monitor Devices, Superfund Site, Remedial Investigation/Feasibility Study, Wall Township. New Jersey, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, December 2, 2003.

3.4 Remedial Investigation Reports

P. 300704- 300841 Letter (with attachment) to Mr. Robert Soboleski, State of New Jersey, Department of Environmental Protection, from Mr. William S. Hose, Westinghouse Environmental and Geotechnical Services, Inc., re: Final Submittal. Phase I Sampling Report, Monitor, Devices Site, Westinghouse Project Number: 1060-86-200, June 14, 1990.

P. 300842 - 300869 Report: Technical Memorandum #2. Recommendations for Monitoring Well Locations, Monitor Devices Site, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, January 29, 1998.

P. 300870 - 300909 Report: Technical Memorandum #3, Data Summary and Recommendations for Additional Field Work, Monitor Devices Site, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, October 22, 1998.

P. 300910 - 301096 Report: Technical Memorandum No. 4. Monitor Devices Superfund Site, Remedial Investigation/Feasibility Study, Wall Township. New Jersey, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, January 25, 2002.

P. 301097 - 301261 Report: Technical Memorandum No. 5. Monitor Devices Superfund Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, March 26, 2003.

P. 301262 - 301290 Report: Final MNA Technical Memorandum, Monitor Devices Superfund Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, September 24, 2003.

P. 301291 - 301926 Report: Data Evaluation Summary Report, Monitor Devices, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, August 13, 2004.

P. 301927 - 302082 Report: Pathways Analysis Report, Monitor Devices Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, September 30, 2004.

P. 302083 - 302386 Report: Final Human Health Risk Assessment. Monitor Devices Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 15, 2005.

P. 302387 - 302631 Report: Final Remedial Investigation Report, Monitor Devices Site, Wall Township, New Jersey. Volume I, RI Report. Tables and Figures, prepared by COM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, August 3, 2005.

P. 302632 - 303049 Report: Final Remedial Investigation Report. Monitor Devices Site, Wall Township, New Jersey, Volume II. Appendices A-H, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, August 3, 2005.

P. 303050 - 304103 Report.: Final Remedial Investigation Report, Monitor Devices Site, Wall Township. New Jersey, Volume III, Appendices I-K, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, August 3, 2005.

3.5 Correspondence

P. 304104 - 304107 Letter (with enclosure) to Mr. Nigel Robinson, U.S. Environmental Protection Agency, from Mr. Thomas Mathew, P. E., CDM Federal Programs Corporation, re: Response to NJDEP Comments on the Proposed Screening Level Criteria, Monitor Devices Site, Remedial Investigation/Feasibility Study, Wall Township, New Jersey, August 27, 2004.

P. 304108 - 304108 Letter to Mr. Nigel Robinson, U.S. Environmental Protection Agency, from Ms. Jeanne Litwin, REM, CDM Federal Programs Corporation, re: Pathways Analysis Report, Monitor Devices Site, Remedial Investigation/ Feasibility Study, Wall Township, New Jersey, September 30, 2004.

P. 304109 - 304110 Response to Comments from NJDEP Received from EPA on March 18, 2005.

P. 304111 - 304132 Letter (with enclosure) to Mr. Nigel Robinson, U.S. Environmental Protection Agency, from Mr. Thomas Mathew, P. E., COM Federal Programs Corporation, re: Response to Comments on the Draft Remedial Investigation Report, Monitor Devices Site, Remedial Investigation/ Feasibility Study, Wall Township, New Jersey, June 17, 2005.

P. 304133 - 304134 Letter to Mr. Nigel Robinson, U.S. Environmental Protection Agency, from Mr. Anton Navarajah, State of New Jersey, Department of Environmental Protection, re: Monitor Devices Superfund Site, Response to NJDEP Review Comments on the Draft Human Health Risk Assessment, August 1, 2005.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400276 Report: Draft Final Feasibility Study Report, Monitor Devices Site, Wall Township, New Jersey, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, August 24, 2005.

7.0 ENFORCEMENT

7.8 Correspondence

P. 700001 - 700001 Letter to Mr. Edward Brown, Wall Herald Corporation from Mr. Stephen Luftig, United States Environmental Protection Agency, re: Monitoring Devices Inc. Site, Allaire Airport- Wall Township, Monmouth County, New Jersey, Notification of Potentially Responsible Party Status, January 12, 1988.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00014 Report: Superfund Program Proposed Plan. U.S. Environmental Protection Agency, Region II. Monitor Devices. Inc./Intercircuits. Inc., August 2005.

APPENDIX IV

STATE LETTER

Richard J. Codey
Acting Governor

State of New Jersey
Department of Environmental Protection

Bradley M. Campbell
Commissioner

SEP 28 2005

Honorable Alan J. Steinberg, Regional Administrator
United States Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

Subject: **Record of Decision (ROD) for Operable Unit No. 1**
Monitor Devices Superfund Site
Wall Township, Monmouth County

Dear Mr. Steinberg:

The New Jersey Department of Environmental Protection (Department) has completed its review of the September 2005 Draft Record of Decision (ROD) for Operable Unit No. 1 (OU1), the contaminated ground water aquifer. We are pleased to concur with the chosen remedial alternative.

The chosen remedial alternative for OU1 includes the installation of a ground water recirculation system (extraction and reinjection wells) in the area of the volatile organic compounds (VOC) plume, along with a system of introducing biologic amendments into the subsurface to promote bioremediation. A monitoring program will be set up to evaluate the progress of the remedy.

Because a number of years would be required before restoration of the ground water is achieved, the preferred alternative includes long-term monitoring of the ground water to ensure that human health and the environment are protected, and institutional controls, such as a Classification Exception Area.

As stated in the ROD, the remedial alternative will control the spread of ground water contamination further downgradient of the site, and reduce the concentration of contaminants in the ground water over time.

The soil contamination at the site will be further evaluated to determine if the nature and extent of the soil contamination has been adequately characterized.

We appreciate the opportunity to participate in the remedial decision making process and the efforts of USEPA to address this contaminated site.

If you have any questions, please do not hesitate to call me at (609) 292-1250.

Sincerely,

Joseph J. Seebode, Assistant Commissioner
Site Remediation and Waste Management Program

cc: Nigel Robinson, USEPA
Anton Navarajah, NJDEP BCM
David Barskey, NJDEP BEERA
Joe Marchesani, NJDEP BGWPA

APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY
Monitor Devices Site
Wall Township, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for the Monitor Devices site, and EPA's responses to those comments. At the time of the public comment period, EPA proposed a preferred alternative for remediating groundwater. All comments summarized in this document have been considered in EPA's final decision for the selection of remedial alternatives for the site.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS.: This section provides the history of community involvement and interests regarding the Monitor Devices site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES: This section contains summaries of oral comments received by EPA at the public meeting, EPA's responses to these comments, as well as responses to written comments received during the public comment period.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for this site. They are as follows:

> **Attachment A** contains the Proposed Plan that was distributed to the public for review and comment;
>
> **Attachment B** contains the public notices that appeared in the Asbury Park Press; and
>
> **Attachment C** contains the transcripts of the public meeting.

EPA received no written comments during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Early in the RI/FS, EPA met with residents and local interest groups to learn about the concerns of the community. EPA has also met Wall Township officials on several occasions to discuss the site, including the Township's plans for future land use of the site and neighboring airport properties.

On August 24, 2005, EPA released the Proposed Plan and supporting documentation for the groundwater remedy to the public for comment. EPA made these documents available to the public in the administrative record repositories maintained at the EPA Region II office (290 Broadway, New York, New York) and the Wall Township Public Library (2700 Allaire Road, Wall, New Jersey 07719). EPA published a notice of availability involving these documents in the Asbury Park Press newspaper, and opened a public comment period on the documents from August 24, 2005 to September 23, 2005. On September 7, 2005, EPA held a public meeting at the Wall Township Library to inform local officials and interested residents about the Superfund process, to present the preferred remedial alternatives for the site, solicit oral comment, and respond to any questions.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS. COMMENTS. CONCERNS. AND RESPONSES

PART I: Verbal Comments

This section summarizes comments received from the public during the public comment period along with EPA's responses.

A. SUMMARY OF QUESTIONS AND EPA's RESPONSES FROM THE PUBLIC MEETING CONCERNING THE MONITOR DEVICES SITE - SEPTEMBER 7, 2005

A public meeting was held September 7, 2005, at 6:00 p.m. at the Wall Township Public Library, 2700 Allaire Road, Wall, New Jersey. Following a brief presentation of the investigation findings, EPA presented the Proposed Plan and preferred alternatives for the site, received comments from meeting participants, and responded to questions regarding the remedial alternatives under consideration.

Comment #1: A commenter representing the Water Resources Association of Monmouth County indicated that, in her former role as mayor of Wall Township she had known about the site for many years and was happy with EPA's plans . for its cleanup. She also asked whether local businesses, particularly the Zodiak/Air Cruiser company, which sits over the area of groundwater contamination, use the contaminated water, and might be exposing workers to it.

EPA response: No local businesses have production wells within the zone of groundwater contamination (this was confirmed by a representative of Zodiak, also attending the meeting).

Comment #2: A commenter asked about the neighboring airport land. A great deal of soil mining has taken place on that property; would the removal of soil change the "footprint" of the groundwater contamination, make it change direction?

EPA response: While changes in topography can affect the direction of groundwater flow to some small degree, the primary direction of groundwater flow at the site is towards the east/ southeast. EPA relies on data from a series of monitoring wells it has installed at the site. The groundwater flow direction has been consistent over time.

Comment #3: A commenter asked whether the proposed remedy would disrupt local businesses in the area, either during construction or during operation and maintenance, particularly for the Zodiak/Air Cruiser company.

EPA response: Use of the contaminated groundwater will, of course, need to be controlled, but EPA does not contemplate any major disruptions to existing businesses during the remedial design, remedial action or subsequent operation and maintenance of the preferred alternative. Enough vacant land appears to be available in the area to implement Alternative 4.

ATTACHMENT A

PROPOSED PLAN

Superfund Program
Proposed Plan

U.S. Environmental Protection
Agency, Region II

MONITOR DEVICES, INC./INTERCIRCUITS, INC.

August 2005

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for addressing groundwater contamination at the Monitor Devices, Inc./Interciruits, Inc., Superfund site, commonly referred to as the Monitor Devices site, and provides the rationale for that preference. The Monitor Devices site was placed on the National Priorities List (NPL) of Superfund sites in 1986. Groundwater at the site is contaminated with a variety of volatile organic compounds (VOCs). EPA's proposed alternative for site groundwater is Alternative 4, enhanced bioremediation, which involves the installation of an extraction and reinjection well system within the contaminated plume that will allow for the introduction of amendents to promote the biologic degradation of the VOCs within the aquifer.

This Proposed Plan includes summaries of all the cleanup alternatives evaluated for use at the site. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities, and the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select the final remedy for the site after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with NJDEP, may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community relations program under section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation Report (RI) and the Feasibility Study Report (FS), and other documents contained in the Administrative Record file for the site. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted at the site.

Dates to remember:
MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
August 24 - September 23, 2005
U.S. EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING:
September 7, 2005, 6:00 pm
U.S. EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Wall Public Library Branch, 2700 Allaire Road, Wall Township, New Jersey.

For more information, see the Administrative Record at the following locations:

U.S. EPA Records Center, Region II
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212)-637-3261
Hours: Monday-Friday - 9 am to 5 pm

Wall Public Library Branch
2700 Allaire Road,
Wall, New Jersey 07719
(732) 449-8877

SITE DESCRIPTION

The Monitor Devices site is located in Wall Township, Monmouth County, New Jersey. The former facility occupies two acres in the Lakewood Industrial Park section of the Monmouth County Airport (also known as the Allaire Airport) off Route 34 (see Figure 1). Monitor Devices formerly occupied Building 25 in the industrial park, which is located along the airport access road at the intersection of George and Edward Streets. Building 25 is currently occupied as a repair and storage facility. The area surrounding the site and the Monmouth County Airport is zoned for mixed residential, commercial, and light industrial use. Several industrial parks, light industry, and commercial properties and undeveloped areas border the airport to the south and west. The airport and commercial park are currently active.

SITE HISTORY

Monitor Devices, Inc., operated in Building 25 from 1977 to 1980. The Monitor Devices operation primarily involved the manufacture and assembly of printed circuit boards used by companies in the computer industry.

As part of the manufacturing process, circuit panels were plated with copper, lead, nickel, gold, and tin. The various plating processes required both electrolysis and electroplating lines. Effluent from the electrolysis and electroplating lines was directed to three pipes that discharged to the rear of the building. The pipes discharged rinse waters from the nickel-gold plating and electrolysis, rinse water from the copper and lead electroplating line, and alkaline washing solution. Volatile organic compounds (VOCs) such as trichloroethylene (TCE) were used as solvents and cleaners in a variety of facility operations.

A complaint against Monitor Devices was filed with the Monmouth County Department of Health (MCDH) in January 1980. In response to the complaint, the MCDH visited the Monitor Devices facility and observed discolored effluent from discharge pipes. Sampling identified elevated levels of copper, lead, and mercury in the effluent and in the stained soils.

In early 1980, site inspections by EPA and the New Jersey Department of Environmental Protection (NJDEP) noted effluent pipes discharging wastewater directly onto the ground, at rates of as much as two gallons per minute. Wastewater that was not percolating into the ground was observed to be flowing around the building and along an access road. A small dam had been constructed to control the migration of manufacturing effluent, resulting in a small unlined pond. Drums of acetone, isopropyl alcohol and a variety of acids were also stored at the site, apparently to be used as part of the facility operations.

NJDEP determined that Monitor Devices never possessed the required permits to discharge wastewater. In May 1980, NJDEP issued a Notice of Civil Administrative Penalty Assessment and an Administrative Order to Monitor Devices. The order required the cessation of all wastewater discharge, the installation of monitoring wells, and groundwater sampling. The company did not fully comply with this order. In 1980, Monitor Devices changed its name to Intercircuits, Inc., and moved its operation to Lakewood, New Jersey. Monitor Devices/Intercircuits declared bankruptcy in 1988 and eventually went out of business.

The Monitor Devices site was proposed for inclusion on the National Priorities List (NPL) in April 1985, and formally placed on the NPL on June 1, 1986. NJDEP initiated an RI/FS field investigation; however, after completing a phase of field investigations, NJDEP requested that EPA assume responsibility for the site.

After several phases of soil and groundwater studies, EPA's environmental consultant completed field investigations in 2004, and prepared a RI Report summarizing the results. In August 2005, a FS Report was completed for the site.

The results of the 2005 RI report are discussed below, and formed the basis for the development of the FS report, released concurrent with this Proposed Plan and included in the Administrative Record for the site.

SITE CHARACTERISTICS

The RI indicated the following:

Soils

EPA sampled surface soils (within the first two feet of the ground surface) and subsurface soils to investigate soil contamination. The soil investigation initially focused on the area surrounding Building 25, in addition to background samples; however, groundwater sampling suggested a possible source area near building 62-C of the industrial park (see Figure 2), and additional soil sampling was also performed there.

Results from the soil sampling did not identify any "principal threat wastes", that is, soils that might be acting as continuing sources of either VOC or metals contamination to the groundwater, at the site. (See explanation of Principal Threats, below). EPA and NJDEP are still evaluating the soil data to determine if the nature and extent of the soil contamination has been adequately characterized.

Groundwater Contamination

The objective of the groundwater investigation was to characterize the vertical and horizontal extent of contamination at, and downgradient of, the site. Using a "Geoprobe" rig, groundwater screening samples were collected, first along the predicted axis of the contaminant plume, and then at progressive depths and distances downgradient, in an effort to identify the plume extent. These screening samples were followed by the installation and sampling of monitoring wells.

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Groundwater samples were collected from monitoring wells and one public supply well to characterize the nature and extent of contamination in groundwater from contaminants associated with the site. A total of 47 monitoring wells were installed and sampled, at depths ranging from 21 feet to 128 feet below the ground surface, and as far as 4,800 feet downgradient of the site. A total of six rounds of groundwater samples were collected during the various investigations. Laboratory results were compared to site-specific screening criteria for groundwater, typically New Jersey Groundwater Quality Criteria or Maximum Contaminant Levels (MCLs).

Groundwater beneath the site flows toward the east, with a slight southern component. The aquifer is an unconfined unit composed of interbedded sand, silt, and gravel, referred to as the Kirkwood-Cohansey aquifer. While generally sandy in the area of the site, silt and interbedded silty gravel layers were detected during the installation of wells MW-17C and MW-19C at approximately 60 and 10 feet, respectively, below ground surface at the site. The Kirkwood-Cohansey aquifer is, on average, 90 feet thick at the site.

Groundwater flow from the site is towards the east/southeast. A public supply well located on Route 34 is approximately one half mile south of Hurley Pond Road. While it is hydraulically downgradient of the site, the groundwater plume does not pose a threat to the public supply well because it is screened in the deeper Englishtown aquifer system, and not the unconfined Kirkwood-Cohansey Aquifer in which site contamination is migrating. Therefore, the Route 34 public supply well has significant confining layers between its productive interval and the overlying Kirkwood-Cohansey Aquifer. It is highly unlikely that the Englishtown Aquifer can be impacted by contamination from the site.

Throughout the groundwater investigation, eight organic compounds exceeded the site-specific groundwater screening criteria; however, of the eight compounds, carbon tetrachloride was only detected in one groundwater sampling round at levels exceeding the site-specific screening criteria, and methylene chloride is believed to be a laboratory contaminant and not associated with the site. The remaining VOCs found were:

- 1,1-Dichloroethylene (1,1-DCE)
- 1,2-dichloroethane (1,2-DCA)
- 1,1,1-trichloroethane (1,1,1-TCA)
- 1,1,2-TCA
- Trichloroethylene (TCE)
- Tetrachloroethylene (PCE)

In the most recent (2004) sampling events, the highest concentrations of these compounds, TCE at 320 parts per billion (320 ppb) and 1,1-DCE at 470 ppb, were detected in MW-17A, located approximately 175 feet downgradient of Building 62-C. The highest concentration of PCE, 8.2 ppb, was detected in MWD-4S. No organic compounds were detected in wells MW-11S and MW-11D, site background wells. In addition, no organic compounds were detected in the side-gradient wells AMW-5 and AMW-6.

All semi-volatile organics were detected below the site-specific screening criteria with the exception of bis(2-ethylhexyl)phthalate, which was detected in one well during one sampling round, and is believed to be a laboratory contaminant. No pesticides or polychlorinated biphenyls were detected in any of the site monitoring wells.

In the 2004 sampling events, nine inorganic analytes exceeded the site-specific groundwater screening criteria, including aluminum, arsenic, cadmium, chromium, hexavalent chromium, copper, iron, manganese, vanadium, cyanide and thallium. Metals contamination is localized to wells near Building 25, and does not indicate any downgradient migration. These metals included chromium at 404 ppb, hexavalent chromium at 190 ppb, and copper at 3,400 ppb.

As stated earlier, groundwater flows toward the east, with a slight southern component; however, the groundwater contaminant plume appears to trend in a more southerly direction than would be suggested by the groundwater gradients. This contradiction (between the groundwater flow patterns and the apparent contaminant migration patterns) led EPA to believe that other sources may exist, such as in the area of Building 62-C. As mentioned earlier, soil sampling at Building 62-C did not show a source emanating from that location.

The area of VOC contamination in groundwater is approximately 3,100 feet long along its primary axis (from northwest to southeast), extending from the Monitor Devices building to approximately 400 feet from the intersection of Route 34 and Hurley Pond Road. The plume is approximately 1,300 feet wide and ranges from 45 to 70 feet in thickness. Groundwater screening and monitoring well sample results show that the groundwater contaminant plume is slightly descending in elevation as it progresses hydraulically downgradient, indicating the presence of a slight downward vertical gradient.

The very high groundwater contaminant concentrations in the area of Building 62-C are either the result of an as-yet-unidentified second release or the result of a slug of groundwater contamination that was discharged during the Monitor Devices operation, and its center has migrated as far as Building 62-C. The high groundwater contamination may indicate a potential secondary source that may have resulted from past airport operations. The presence of discontinuous layers of silts and clays in the aquifer in this same area may also contribute to this contamination pattern.

Groundwater samples were also collected to evaluate the degree to which contamination might be naturally attenuating, through biodegradation or other conditions naturally present in the aquifer. There was little evidence that natural attenuation of the VOC contaminants is occurring at levels that would warrant consideration of "monitored natural attenuation" as a remedial strategy.

No organic compounds were detected in the groundwater sample collected from the Route 34 public supply well (PSW-1), and no inorganics detected exceeded the site-specific groundwater screening criteria.

ENFORCEMENT

Based on the findings of County, State and Federal inspections, the NJDEP's Division of Water Resources issued an Administrative Order (AO) and Notice of Civil Administrative Penalty Agreement in May 1980 for unpermitted discharges. Except for payment of $1,500 and installation of three monitoring wells, Monitor Devices failed to comply with the AO requirements, particularly the installation of a groundwater recovery and decontamination system. In 1985, Monitor Devices and its president were named in a six-count indictment by a Monmouth County Grand Jury for unlawful release, criminal mischief, and illegal discharge of pollutants in violation of New Jersey Water Pollution Act of 1977. The indictment resulted in a guilty plea and the agreement to pay $100,000 towards the clean-up of the site. The plea agreement was not complied with; in 1988 Monitor Devices went bankrupt and the State of new Jersey decided to take no further action against the company or its president.

In 1985, EPA conducted a financial review of Wall-Herald, the owner of the site, and of Monitor Devices. Based on the investigation, it was concluded that both companies appeared to have insufficient resources and/or environmental expertise to perform the RI/FS.

SCOPE AND ROLE OF THE ACTION

EPA plans to address groundwater at this site in this first operable unit. EPA and NJDEP are still evaluating the nature and extent of soil contamination that may be associated with the site.

SUMMARY OF SITE RISKS

The human health risk assessment (HHRA), a portion of the RI Report for the site, evaluated both soil and groundwater contaminants. EPA and NJDEP are still evaluating the soil data; therefore, the HHRA summary, below, only discusses the groundwater conclusions.

Among all receptors evaluated at the site, only current and future site workers and off-site residents had potential adverse health impacts due to exposure to site contaminants released from the Monitor Devices site. Detailed summary of risk estimates for site workers under the current and future land use scenarios and off-site residents under the future land use scenario are presented below.

On-site Workers

Under the current land use scenario, site workers exposed to groundwater contamination are limited to inhalation of vapors migrating from the subsurface. However, under the future land use scenario, groundwater exposure to site workers could also include direct ingestion with groundwater if wells are installed to use groundwater as tap water.

The total reasonable maximum exposure (RME) estimated cancer risk for workers (2×10^{-4}) is slightly above the EPA target range of 1×10^{-6} to 1×10^{-4} for current exposures, due to the potential for inhalation of TCE from vapor intrusion, and increases to 3×10^{-4} for future workers when groundwater ingestion is also included.

The total hazard index for current and future site workers is above the threshold of unity (1) for RME exposure, primarily due to ingestion of TCE in tap water. TCE, the major risk driver in the groundwater, can adversely impact the liver, kidney, and fetus.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of concern at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects

Off-site Residents

Off-site residents near the Monitor Devices site could be exposed to contaminants in groundwater in the future if wells are installed that draw on the contaminated portion of the aquifer for tap water. Residents may be exposed to contaminants in groundwater via drinking water ingestion, dermal contact while showering/bathing, and inhalation of vapors while showering/bathing.

Adult: The cancer risks for future adult residents exposed to groundwater from the site exceeded the range of 10^{-6} to 10^{-4} for the RME scenario (6×10^{-4}). Cancer risks for adult residents are predominantly due to the presence of TCE, 1,1-DCE, and arsenic in groundwater.

TCE and 1,1-DCE have been identified as site-related contaminates. Arsenic is widely distributed in the environment. The site-specific background concentration of arsenic in groundwater was 4.3 µg/L, while the arsenic concentration used in the risk calculation was 6.7 µg/L; consequently, about 65 percent of the risk calculated due to arsenic for the site is contributed to the arsenic background concentration.

The total hazard index for future adult residents exceeds the threshold of 1 for RME (8). This is primarily due to the presence of TCE in groundwater. Exposure to elevated concentrations of TCE may cause adverse effects to the liver, kidneys, and developing fetus.

Child (0 to 6 years): The cancer risks (1×10^{-3}) for future child (0 to 6 years) residents exposed to groundwater from the site exceeded the range of 1×10^{-6} to 1×10^{-4} for RME. Cancer risks for child residents are predominantly due to the presence of TCE, 1,1-DCE, and arsenic in groundwater. Again, the exposure point concentration (EPC) of arsenic (6.7 µg/L) used in the risk calculation was only slightly higher than the site-specific background concentration of arsenic (4.3 µg/L); consequently, about 65% of the total risk calculated for the site due to arsenic is contributed to the arsenic background concentration.

The total hazard index for future child residents exceeds EPA's threshold of 1 for RME (19) This is primarily due to the presence of TCE in groundwater. Exposure to elevated concentrations of TCE may cause adverse effects to the liver, kidneys and developing fetus.

Human Health Risks

Based on results of the HHRA, the groundwater is determined to be the environmental concern for the site. The potential risks to current and future site workers and to future off-site residents using groundwater as tap water exceeded EPA's thresholds of concern. The dominant risk drivers in groundwater were TCE, 1,1-DCE, and arsenic. TCE and 1,1-DCE have been identified as site-related contaminants. Arsenic is widely distributed in the environment. The site-specific background concentration of arsenic in groundwater was 4.3 ppb, while the arsenic concentration used in the risk calculation was 6.7 ppb; consequently, about 65 percent of the risk calculated from arsenic for the site is contributed to the arsenic background concentration. Furthermore, based on the site history, arsenic is not considered a site-related contaminant at the Monitor Devices site.

Ecological Risks

An ecological risk characterization was performed for the Monitor Devices site in 1998 and re-evaluated in 2004. A groundwater evaluation indicated very little potential to adversely affect aquatic life due to the limited possibilities of groundwater reaching the surface. No further consideration of groundwater was warranted in the Ecological Risk Assessment.

It is EPA's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect human health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives for contaminated groundwater address the human health risks and environmental concerns at the Monitor Devices site:

- Prevent or minimize potential current and future human exposures including ingestion and dermal contact with groundwater that presents a significant risk to public health and the environment;

- Minimize the potential for off-site migration of contaminated groundwater; and

- Restore the groundwater to drinking water standards within a reasonable time frame.

There are currently no complete exposure pathways to contaminated groundwater beneath the Monitor Devices site because there are no known contaminated wells in use. All residents in the area of the site are currently connected to the municipal water system; however, if contaminated groundwater is used as drinking water in the future, significant health risks would exist. In addition, if the contaminated groundwater were used in industrial processes within the area, significant human health risks may exist. Thus, remedial actions must minimize the potential for human exposure to contaminated groundwater.

Table 1 lists the contaminants of concern found in groundwater at the site, and their respective Cleanup Goals, in this case the drinking water standards (MCLs) or Ground Water Quality Criteria (GWQCs). Cleanup Goals were selected that would both reduce the risk associated with exposure to contaminants to an acceptable level and ensure minimal migration of contaminants off the site. The metals chromium, hexavalent chromium and copper were identified as contaminants of potential concern; however, because these metals were not identified as risk drivers and were localized to only one well cluster, EPA is not proposing Cleanup Goals for these metals. A groundwater monitoring program for the site should retain metals testing, and if monitoring results indicate that the extent of the metal contamination changes, remediation of metals could be evaluated.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for the Monitor Devices site are presented below.

Each groundwater remediation alternative would be coupled with institutional controls to limit the potential exposure of the public to the groundwater contamination until the groundwater is cleaned up. Institutional Controls typically are restrictions placed to minimize human exposure and continue monitoring to track contaminant migration (i.e., long-term monitoring). Institutional controls are generally used in conjunction with other remedial technologies. Consistent with expectations set out in the Superfund regulations, none of the remedies rely exclusively on institutional controls to achieve protectiveness.

The time frames below for construction do not include the time for remedial design or the time to procure contracts.

ALTERNATIVES

Alternative 1: No Action

Estimated Capital Cost: *$0*
Estimated Annual Operation & Maintenance (O&M) Cost: *$0*
Estimated Present Worth Cost: *$0*
Estimated Construction Time frame: None

Regulations governing the Superfund program expect that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to prevent exposure to contaminated groundwater. Institutional controls would not be implemented to restrict future groundwater use.

Alternative 2: Institutional Controls/Long-term Monitoring

Estimated Capital Cost: *$37,000*
Estimated Annual O&M Cost: *$71,000*
Estimated Present Worth Cost: *$975,000*

Alternative 2 relies on institutional controls, such as a classification exception area (CEA), to prevent future use of contaminated groundwater within the boundaries of the site, and a groundwater monitoring program would be established to evaluate the groundwater contamination over time. Under the groundwater monitoring program, groundwater conditions would be monitored periodically (e.g., quarterly, semi-annually or annually).

Long-term monitoring activities would include annual groundwater sampling from some of the 47 site monitoring wells and the public supply well downgradient to the contaminant plume for VOC analysis. In addition, groundwater samples would be collected periodically from three monitoring wells for metals analysis. Since this alternative results in contaminants remaining on site above levels that would not allow for unlimited use, a review of the site at least every 5 years would be required.

Alternative 3 - Groundwater Collection and Treatment

Estimated Capital Cost:	*$ 1,400,000*
Estimated Annual O&M Cost:	*$ 325,000*
Estimated Present Worth Cost:	*$5,400,000*

The objective of Alternative 3 is to remediate the contaminated groundwater plume through groundwater pumping and treatment. Treatment of extracted groundwater would involve a combination of filtration and air stripping. Based on the estimated air emissions from the air stripper, vapor phase treatment would not be necessary.

The feasibility study evaluated a number of different combinations of groundwater extraction wells and treated water discharge options, including discharge to surface water and reinjection (see Feasibility Study Report). For cost-estimating purposes in this Proposed Plan, this Alternative assumed a series of extraction wells that would capture the 10 ppb TCE plume, requiring a pumping rate of 280 gallons per minute (280 gpm). The treated water would be discharged to a storm water catch basin associated with the airport.

This alternative also includes institutional controls such as groundwater use restrictions and periodic groundwater monitoring to track the migration of the plume and to verify the effectiveness of this alternative. It is estimated that this system would be need to be operated for 25 years in order to restore the aquifer.

Since this alternative results in contaminants remaining on site at levels that would not allow for unlimited use of the groundwater until the remedial action is completed, a review of the site at least every five years would be conducted.

Alternative 4: Enhanced Groundwater Bioremediation

Estimated Capital Cost:	*$2,600,000*
Estimated Annual O&M Cost:	*$ 890,000*
Estimated Present Worth Cost:	*$7,250,000*

This alternative involves enhanced bioremediation for destruction of contaminants, through groundwater collection, treatment (if necessary), and reinjection of water and nutrients or other chemical amendments into the contaminated aquifer. It would be implemented by installing and operating multiple two-well recirculation loops oriented parallel to the direction of groundwater flow. The downgradient well in each loop would be used for groundwater extraction, and the upgradient well would be used for injection of groundwater and bioremediation amendments. The reinjection of amendments with groundwater into the aquifer would encourage bioremediation within the aquifer, thereby accelerating the rate of aquifer recovery.

Bioremediation would be implemented by stimulating microbes in the aquifer that would then destroy the VOCs, through one of two mechanisms, aerobic co-metabolism or enhanced anaerobic bioremediation (EAB). The selection of the bioremediation approach to be implemented would be based on the outcome of bench-scale treatability studies during remedial design. In terms of overall implementation, both bioremediation technologies would be similar with the exception of the actual amendments to be delivered to the subsurface. For aerobic co-metabolism, the amendments would be oxygen and a primary substrate (e.g. methane, propane, butane, or ammonia), while for EAB, the amendment would be an electron donor such as lactate or whey powder.

Treatment of the extracted water may be necessary prior to reinjection in order to satisfy regulatory requirements. It is assumed, for cost-estimating purposes, that treatment would be required and that it would be similar to the technologies discussed in Alternative 3.

The feasibility study evaluated a number of different combinations of groundwater extraction wells. For cost-estimating purposes in this Proposed Plan, this alternative assumed 16 recirculation loops to capture and treat the 10 ppb plume. The recirculation loops would be operated in a pulse mode in which they would extract, treat, and inject groundwater along with bioremediation amendments periodically. The recirculation loops would only be operated during a bioremediation amendment injection event.

This alternative also includes institutional controls such as groundwater use restrictions and periodic groundwater monitoring to track the migration of the

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that are legally applicable, or relevant and appropriate to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

plume and to verify the effectiveness of this alternative. It is estimated that this system would be operated for approximately 10 years to actively restore the aquifer. It is estimated that five to eight annual sampling rounds would be conducted after completion of active operations in order to confirm that the site has been restored.

Since this alternative results in contaminants remaining on site at levels that would not allow for unlimited use of the groundwater until the remedial action is completed, a review of the site at least every five years would be conducted.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy, (see Table above) "Evaluation Criteria for Superfund Remedial Alternatives"). This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed above. The "Detailed Analysis of Alternatives" can be found in the FS.

1. Overall Protection of Human Health and the Environment

The no action alternative is not considered protective because it does nothing to prevent exposure to contaminated groundwater in the future, which would result in unacceptable future risks.

The remaining alternatives are considered protective. Alternative 2 (Institutional Controls and Monitoring) is considered protective because it includes restrictions on the use of groundwater and includes groundwater monitoring to ensure that the plume does not migrate to areas that would result in human exposure. Alternative 2 eliminates human contact. Alternatives 3 and 4 also meet the threshold of preventing human exposure and take differing approaches to remediating the groundwater contamination, but are equally protective of human health.

2. Compliance with ARARs

The Cleanup Goals (see Table 1) are MCLs or groundwater quality standards and, therefore, ARARs. Alternative 1 (No Action) would not meet ARARs. Alternative 2 (Institutional Controls and Monitoring) is not expected to achieve ARARs in a reasonable time frame due to limited natural attenuation (dilution only) at the site. Alternative 3 (groundwater collection and treatment) may not meet the Cleanup Goals in the entire aquifer within a 30-year time frame but would substantially reduce contaminant concentrations and achieve ARARs throughout much of the aquifer within 30 years. Alternative 4 (enhanced bioremediation) would likely meet the Cleanup Goals in 15 years.

Alternatives 2 through 4 would require institutional controls, such as a CEA, to control use of the groundwater until groundwater Cleanup Goals can be met.

Because the No Action and Monitoring alternatives (1 and 2) are not expected to meet at least one of the threshold criteria (Protection of Human Health and the Environment and Compliance with ARARs), they were eliminated from consideration under the remaining seven criteria.

3. Long-term Effectiveness and Permanence

Alternatives 3 and 4 are considered permanent remedies and the long-term effectiveness of these alternatives would be assessed through routine groundwater monitoring and five-year reviews.

Alternative 4 ranks higher than Alternative 3 in long-term effectiveness and permanence since it is estimated to restore aquifer conditions in as little as half the time.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment

Alternatives 3 and 4 would reduce the toxicity, mobility or volume of the contaminants in groundwater through extraction and treatment (for Alternative 3) or through enhanced bioremediation in conjunction with pump and treat (for Alternative 4). Alternatives 3 and 4 offer a comparable level of improvement in mobility and toxicity reduction.

5. Short-term Effectiveness

Alternatives 3 and 4 have minimal impacts with respect to the protection of workers, the community, and the environment during remedial construction. Both the active alternatives involve long-term operation of treatment facility at the site, though the size of the treatment works is expected to be minimal. Alternative 4 has potential worker or community impacts due to the injection of various reagents into the aquifer, though the primary concern would be in the management of drummed chemicals at the treatment facility.

The short-term effectiveness with respect to the time until the remedial action objectives are achieved is quickest for Alternative 4 (enhanced bioremediation). For Alternative 3, it is expected that MCLs in much of the groundwater might be achieved in less than 30 years, but that meeting MCLs in the whole aquifer was estimated to be 87 years. Alternative 4 will achieve the remedial action objectives faster than Alternative 3, approximately 15 years.

6. Implementability

Alternatives 3 and 4 would be constructed using standard construction equipment and services. The administrative implementability of Alternative 3 (e.g, obtaining NJPDES permit for the discharge of treated water) could be time-critical. The administrative implementability of Alternative 4 (e.g, obtaining required permits for injection of bioremediation amendments) would be more difficult and need to be further evaluated, but the alternative is still considered implementable.

The primary technical implementability constraint is reinjection of water, or in the case of Alternative 4, water and amendments to promote bioremediation. Reinjection can be avoided for Alternative 3 by discharging the treated water to local surface water, but reinjection is an integral feature of Alternative 4. A number of technical challenges, including well fouling and shortcircuiting, are associated with reintroducing water into an aquifer. These challenges can be managed but raise the level of involvement required during operation and maintenance of the system.

7. Cost

Alternative	Cost
1	$0
2	$ 975,000
3	$5,400,000
4	$7,250,000

8. **State/Support Agency Acceptance**

The State of New Jersey is still evaluating EPA's preferred alternative in this Proposed Plan.

9. **Community Acceptance**

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be described in the Record of Decision, the document that formalizes the selection of the remedy for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

The Preferred Alternative for cleanup of the groundwater at the Monitor Devices site is Alternative 4, Enhanced Bioremediation, hereafter referred to as the Preferred Groundwater Alternative.

This alternative includes the installation of a groundwater recirculation system (extraction and reinjection wells) in the area of the VOC plume, along with a system for introducing biologic amendments into the subsurface to promote bioremediation. Treatability studies would determine the best conditions either aerobic or anaerobic, for successful bioremediation within the aquifer. A monitoring program would be required to evaluate the progress of the remedy.

Because a number of years would be required before restoration of the groundwater is achieved, the preferred alternative includes long-term monitoring of the groundwater to ensure that human health and the environment are protected, and institutional controls, such as a Classification Exception Area, or well restrictions.

The Preferred Alternative is believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes that the Preferred Alternative would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected alternative can change in response to public comment or new information.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of the Monitor Devices site to the public through public meetings, the Administrative Record file for the sites, and announcements published in the Asbury Park Press Ledger newspaper. EPA encourages the public to gain a more comprehensive understanding of the sites and the Superfund activities that have been conducted there.

For further information on the Monitor Devices site, please contact:

Nigel Robinson Remedial Project Manager (212) 637-4394	Natalie Loney Community Relations Coordinator (212) 637-3639

U.S. EPA
290 Broadway 19th Floor.
New York, New York 10007-1866

The public liaison for EPA's Region 2 is:

George H. Zachos
Regional Public Liaison
Toll-free (888) 283-7626
(732) 321-6621

U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837-3679

The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan. EPA Region 2 has designated a public liaison as a point-of-contact for the community concerns and questions about the federal Superfund program in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. To support this effort, the Agency has established a 24-hour, toll-free number that the public can call to request information, express their concerns, or register complaints about Superfund.

TABLE - 1
CONTAMINANTS IN GROUND WATER

Contaminants	**Highest Concentration (Parts per billion)**	**Ground water cleanup levels (Parts per billion)***
1,1-Dichloroethylene (1,1-DCE)	470	2
1,2-Dichloroethane (1,2-DCA)	8.8	2
1,1,1-Trichloroethane (1,1,1-TCA)	210	30
1,1,2-Trichloroethane (1,1,2-TCA)	7.3	3
Tetrachloroethylene (PCE)	8.2	1
Trichloroethylene (TCE)	320	1

* - New Jersey Department of Environmental Protection Groundwater Quality Criteria.

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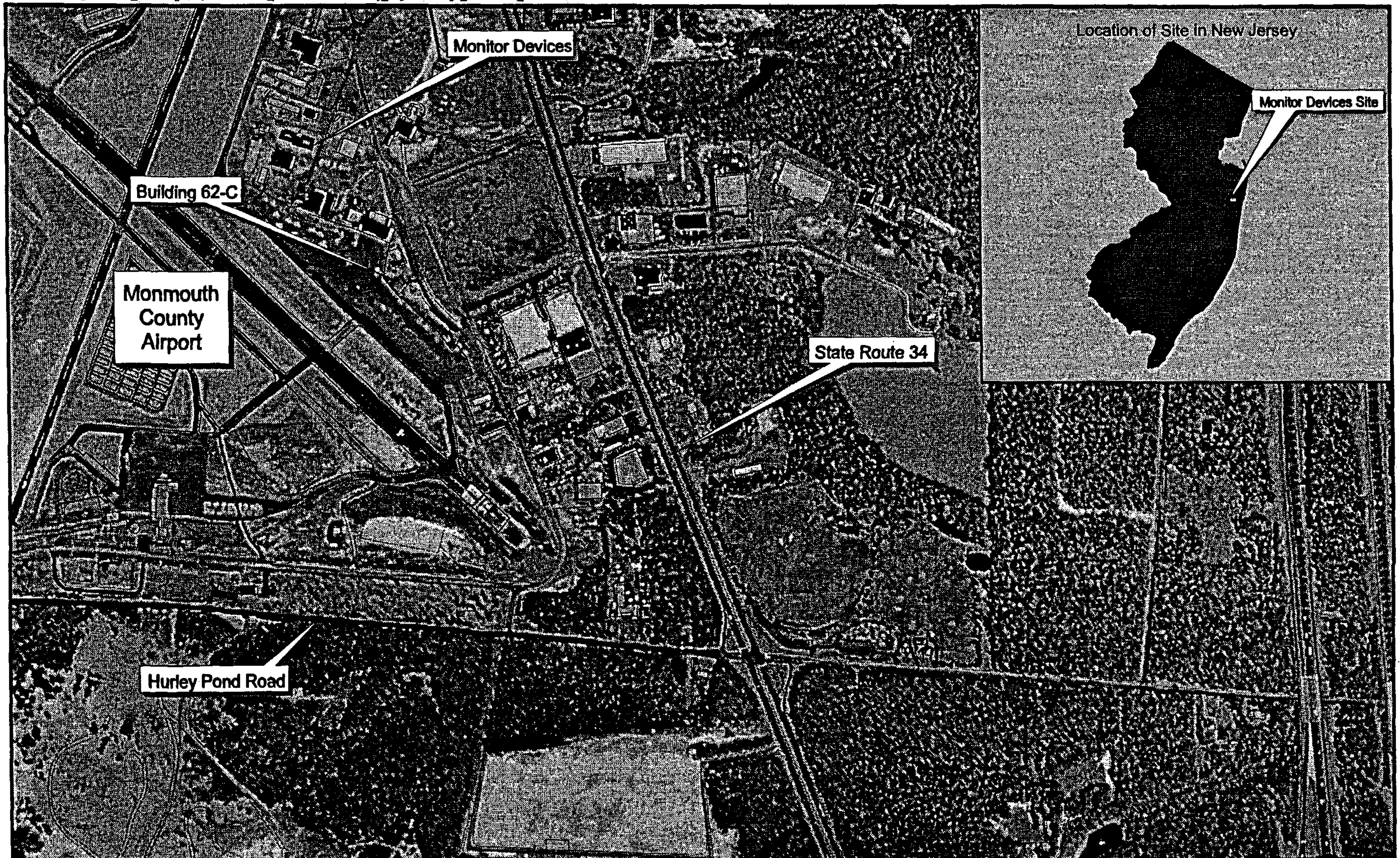


LEGEND

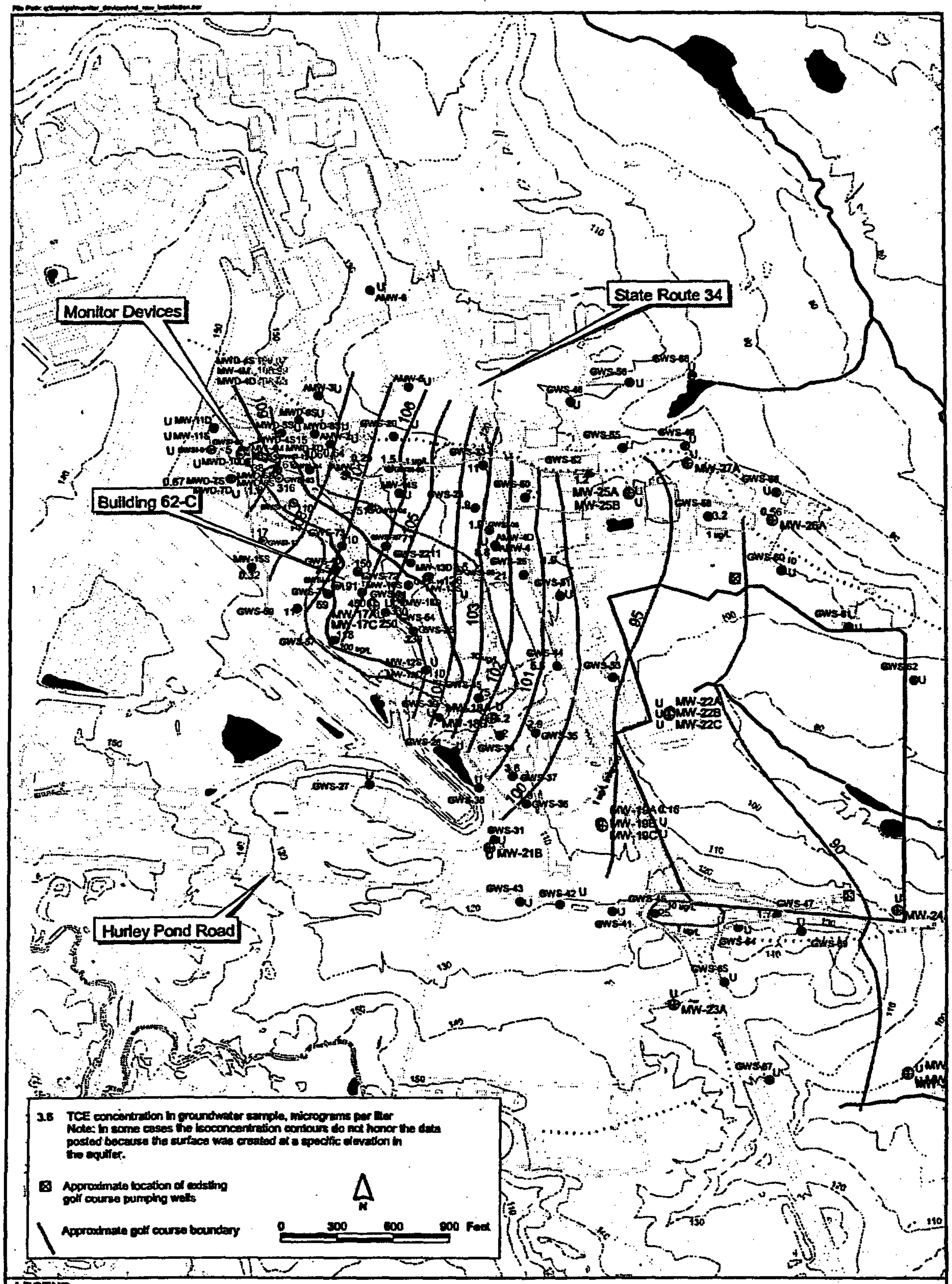
- Monitor Devices
- Property Boundaries
- Roads.
- Airport
- Buildings

N

0 700 Feet

Figure 1
Site Location Map
Monitor Devices Site
Wall Township, New Jersey

CDM



LEGEND

- Surface water drainage divides, estimated
- TCE isoconcentration contour, 1 ug/L
- TCE isoconcentration contour, 1 ug/L inferred
- TCE isoconcentration contour, 10 ug/L
- TCE isoconcentration contour, 100 ug/L
- Potentiometric Surface, March 8, 2004, 75 to 100 foot elevation
- GWSI Phase I Groundwater Screening Locations, 1997-1998
- Phase II GW Screening Locations
- Phase III GW Screening Locations
- Existing well locations
- Monitoring Wells, installed in 2004
- Streams
- Surface Water Bodies
- Monitor Devices
- Topographic contour, dashed where obscured

Figure 3
Potentiometric Surface and TCE Data
75 to 100 Foot Elevation, March 2004
Monitor Devices Site
Wall Township, New Jersey

CDM

ATTACHMENT B

PUBLIC NOTICE

EPA is hosting a Public Meeting for the Monitor Devices Superfund Site

The U.S. Environmental Protection Agency invites you to attend a public meeting to discuss the Proposed Plan to address contaminated groundwater at the Monitor Devices Superfund site in Wall Township, New Jersey.

The meeting will be held at the Wall Public Library at:

2700 Allaire Road
Wall Township, New Jersey
on Wednesday September 7, 2005
at 6:00 PM

To request a copy of the Proposed Plan you can,

e-mail Natalie Loney, Community Involvement Coordinator:
loney.natalie@epa.gov

or call Natalie: (212) 637-3639 or toll-free at 1-800-346-5009

or visit EPA's website:

http://www.epa.gov/region02/superfund/npl/monitor_devices_proposal2005.htm

The public comment period for this Proposed Plan runs from Wednesday August 24, 2005 to Friday, September 23, 2005. All written comments should be mailed to:

Nigel Robinson, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY
10007-1866

Or you can e-mail your comments to:
robinson.nigel@epa.gov

AmerGen

FROM PAGE A1

stated that the company still could have its application accepted if it followed one of two state proposals designed to drastically reduce the number of animal deaths.

According to a 1989 report funded by the plant when it was owned by GPU Nuclear, the cooling system killed bay anchovies, grass shrimp, hard clams and blue crabs — species whose numbers near the plant still concern state officials.

The study estimated that 12 percent of Barnegat Bay's bay anchovy population was being killed annually in the cooling system. The 12 percent amounted to 354,000 pounds. For grass shrimp, also called sand shrimp, the statistics were even more distressing: 17 percent of the shrimp lost, or 1.65 million pounds.

Cooling tower urged

Department officials pointed to those figures last month in an attempt to convince AmerGen to build a cooling tower. The tower is a way the plant could obtain the permit it needs to use two

application. The company provided the best available data and continues to believe the plant would be consistent with the state's coastal protection policies, he said.

Ecological studies commissioned by AmerGen are now in progress, Nesbit said. Results are expected to augment data already provided to the department, though the company is only required to use existing data to make its case, he said.

The DEP wants the nuclear

"We need to talk to the state and find out what they need from us," Nesbit said. "If that

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

- -x
IN RE: :
EPA MONITOR DEVICES SUPERFUND SITE :
- -x

EPA Meeting, held at the Wall Public Library, 2700 Allaire Road, Wall, New Jersey, on Wednesday, September 7, 2005, commencing at 6:10 p.m., before Jamie I. Moskowitz, CSR, RPR, CRR, a Certified Shorthand (Stenotype) Reporter and Notary Public within and for the State of New York.

A P P E A R A N C E S:

ENVIRONMENTAL PROTECTION AGENCY
Community Involvement Coordinator
Public Outreach Branch
290 Broadway - 26th Floor
New York, New York 10007

BY: NATALIE LONEY

ALSO PRESENT:

NIGEL ROBINSON, Remedial Project Manager
JOHN PRINCE, Section Chief, Central NJ Remediation
JULIE McPHERSON, Human Health Risk Assessor
GRANT ANDERSON, Hydrogeologist

MS. LONEY: Good evening, everyone. Thank you for coming to the public meeting for the Monitor Devices Superfund Site. My name is Natalie Loney. I'm the community involvement coordinator for the site, and with me today from EPA is Nigel Robinson.

Nigel is the remedial project manager from the site. We have John Prince who is the section chief for New Jersey. I have Julie McPherson. Julie is a human health risk assessor. And next to Julie is Grant Anderson, also with us. He is a hydrogeologist.

I'm just going to go over briefly where we are in terms of the work at the Monitor Devices Site. After my brief remarks, Nigel is going to come and talk about the site history and what's led up to the proposed remedy to address contamination at the site.

This rather wordy slide really is broken down into this continuum.

And these are the different steps in the Superfund process from site discovery through ranking onto the NPL site, the remedial investigation and feasbility study where we look at the nature and extent of contamination at a Superfund site, and what are some of the feasible options for addressing contamination. We're now at this phase. We have come up with a proposed remedial action plan for the site.

We have a public meeting and glean comments from the public on EPA's proposed remedy. From this phase we move on to the record of decision where EPA memorializes our decision as to what the remedy to address the contamination at the site will be.

We then, from the rod, we go into the remedial design, and finally the operation and maintenance of the remedy, whatever is selected. So, this is relatively straightforward. I don't want to go into any great length of detail about it. Just see where we are now.

So, I'm just going to let Nigel come up to the podium, and talk to you about what's going on at monitor devices and where we are in terms of an action plan to address contamination.

MR. ROBINSON: Thanks, Natalie. I just have a presentation here since I see only two outsiders and the rest are linked to EPA in one way or another. I will try and make it quick and whatever question and answer session at the end.

So, anyway this is just an aerial photograph of the site and the area around it, and right along here is Route 34, and then this is Hurley Pond Road. This is the Allaire Airport, this is the runway and site or the building where the contamination originated is referred to as Building 25, and that's right here.

And here is Air Cruiser right along Route 34, and then you have a golf -- not a full golf course but a putting range right at the corner of Hurley Pond Road and Route 34.

Okay. The site is two acres and it is located by the Allaire Airport in the industrial park section. And it is located right at George and Edward Street. And we will keep referring to it as Building 25. It's operated from 1977 to 1980.

It basically manufactured and assembled printed circuit boards for the electronic industry. The circuit panels or the boards were plated with copper, lead, nickel, gold and tin. The effuent from the operation, which involved electrolysis and electroplating were unfortunately discharged to the outside of the building, to the rear of the building, and that's what caused or originated the contamination at the site.

And based on investigation by New Jersey DEP, Monmouth County Health Department and other local authorities, we went through the whole process Natalie earlier referred to, and the site was eventually placed on the national priority list in 1986.

The folks who are not familiar with the national priority list, it is the list of Superfund sites, toxic waste sites, the worst sites, the most contaminated sites. We basically have a list and they have different ranking based on their toxicity.

Okay. We performed and we have just completed remedial and -- remedial investigation and feasbility study. And during that process we ended up doing groundwater screening at 63 locations. Basically the screening were to determine where you would find the most contaminated groundwater at the site. And in addition to that we did surface -- we sampled for surface and subsurface soils. We ended up installing 31 monitoring wells. Altogether I think there are 47 wells at the site.

EPA installed 31, and the remaining monitoring wells were either installed by the property owner or by New Jersey DEP. In all, we took six drums of groundwater samples to try to characterize the nature and extent of the contamination at the site.

Trying to -- this slide gives an indication, like a cross section if you're looking through -- through the earth, and this is Monitor Devices' site. This is ground level, surface level, and then we have a layer of soil going from -- basically 80 to 120 feet thick. This is referred to as the unconfirmed aquifer, and this is Kirkwood cohansey. And this is where a lot of the wells are on the golf course they are located within this formation. And then we have what we call aquitard, it's more like a confining layer. It's 25 to a hundred feet thick and then below it we have the Englishtown aquifer. This is an aquifer that the public water supply is obtained from within the area.

And within the area most businesses and most residents, they obtain their water supply from the municipality. The closest public supply well is located 4,700 feet just, a little bit short of a mile, along Route 34. And as I mentioned earlier, it's a screened in the Englishtown aquifer, and we have sampled it, and it is shown -- and it shows no contamination.

And as I mentioned also, the golf course, this is located across Route 34, uses groundwater from the upper aquifer for irrigating their own grounds.

The groundwater results from the sampling that we did shows eight volatile organics, refers to them as VOCs, that exceeded the site-specific screening criteria. Basically just exceeded the standard. We found very few semi-volatile organics, and we found no pesticides or PCBs. And we found seven inorganic compounds that exceeded the standard. And of these, three of them are directly attributed to the site and the operation that we placed there.

In analyzing the volatile organic compounds that we found, and this is what we came up with: Trichloroethylene, 1,1, 2-trichloroethene, 1, 1-dichlorethylene, 1, 2-dichlorethene and 1, 1, 1-trichloroethene. The biggest one is trichloroethylene, which we referred to as TCE, and it is in I will say larger quantity, and it's the compound that we are most concerned with at the site. We came up with three organics, and they are chromium, hexavailent chromium, copper.

The groundwater results that I said earlier, we found that TCE was the most widely detected contaminant at the site, and then we found TCE in 21 of the 47 monitoring wells that we sampled in 2004, last year.

TCE exceeded site-specific screening criteria of one part per billion in 13 of the wells. The highest concentration of TCE was detected in monitoring well 17A, and this was at 340 parts per billion.

Okay. We plotted the TCE plume and you see that later on a map. And it is basically 2,800 feet long and at its widest points there's 1500 feet wide, and is ranges from 40 feet below ground to 120 feet below ground. And it's near Building 62C, which I will also show you on the map. And it ranges from 45 to 70 feet in thickness.

Okay. This is the map, and just referring again to that first photograph, this along here, this road here, this is Route 34. This is Hurley's Pond Road. Okay, this is the airport runway, and this is Monitor Devices Building 25. This is where the contamination originally occurred. And in here, just a little bit down right across from -- from Air Cruiser we have Building 62C. And this is the plume that we have plotted, the groundwater contamination.

And on the outer edge which is the green line, that is -- we have concentration of TCE of 1 part per billion. If you move further in, the yellow line or mustard line it has concentration of 10 parts per billion. And the red line has concentration of 100 parts per billion.

So, within this red area, this is where we have the highest concentration of TCE contamination.

This is another profile of the contamination, and here to draw a point of reference, this is the Route 34 right here. This is a golf course over here. And right within this point again, this is where we have the highest level of concentration greater than a hundred PPB. Then on the outer one we go to ten PPB, and then the last one, one PPB.

And you see that here where the original Monitor Device's building is, and if you go right down here you will see that a contamination left this building's leach true to soil and work its way down.

We also believe that right around here, Building 62C, that that was also a source for some of the contamination that we have here.

The soil results that we did

at the site, the soil that we sampled, the result shows that VOCs, the organic and the semi-volatile organic pesticides and PCBs were detected below a site-specific cleanup criterias or screening criteria. Arsenic was also detected above the site-specific soil screening criteria, but also detected in background samples. And we do not believe that it is soil related. I think that arsenic is just a natural occurring element within this area.

Investigation that we have performed to date have shown or identified areas of soil contamination that pose -- identified areas of soil contamination that really doesn't pose a direct contact risk as a source to groundwater. However, EPA and DEP are still going over the results, and we will determine at some point in the not too distant future in a matter of months, if the soil work that we have done there has been adequately characterized and we need to go back and look at different things.

In terms of the surface water and sediments, we also did some sampling there. And we found that it is unlikeliy -- it is unlikely contaminants found in surface water and sediment were a result of contamination from the site.

And there is also a little patch, like a pond area right below the end of the runway and that's the surface water that we analyzed. And we don't think that the groundwater discharges directly into that surface water body.

We then looked at the contaminant fates and transport. And it's basically looking at how contaminants move through soil and through groundwater. And what we found that the greatest potential for transport of contaminants is by groundwater migration. We found that surface drainage -- surface water and sediment transport, dust generation and air transport are not considered significant transport mechanism for the contaminants that we found at the site.

We also found that the chlorinated VOCs, such as TCE detected in groundwater persists due to low degradation. Basically, it gets into the water, it moves very slowly, and it doesn't break down easily or quickly.

So, you will find that the compound can be in the groundwater for 10, 15, 20 years. Okay?

What we also looked at is if there was any, say, biologic degredation of these chlorinated compound. And we looked at anaerobic reductive chlorination, and we found that it is limited. And we found that aerobic degredation appeared to be insignificant in the groundwater.

And just to talk a little bit more on that. At some Superfund sites, when you have groundwater contamination, we perform what you call -- we look at natural attenuation, and basically what it is is to look at the contaminants, analyze them, and see if they are breaking down into simpler compounds.

If they are breaking down into simpler compounds, then we look at the risk that it poses to the community, to monitoring wells, et cetera. And if it doesn't pose much of a risk and if the breakdown is quick, then we might not need to spend, you know, money to remediate it.

And so, that's one of the reasons why we looked at whether aerobic or anaerobic degredation takes place at the site in the groundwater.

And then we looked at the risk that contaminated groundwater poses.

And here we looked at human health risk assessment, which was also performed as a part of this entire RIFS study. And we found that the key contaminants were trichlorethylene, 1, 1-diclorethylene and tetrachlorethylene.

We found that the use of groundwater at the site currently could pose a risk to site workers. And we also looked at the future use of the groundwater at the site, and it could also pose a risk to on-site workers, and, say, if a day care center was established at the site, it could pose a risk to the children there and to off-site residents.

Okay. After looking at the risks, looking at the fate and transport of contaminants and groundwater, looking at all of the sampling, then we tried to come up with a preferred alternative.

And in looking at or in coming

up with a preferred alternative to address the problem at the site, we look at how protective of human health and environment the alternatives are, and whether they comply with regulations, whether federal, state or local. How consistent they are with the CERCLA and Superfund, and CERCLA and Superfund are basically the policies that we are mandated to go by. And how easy these remedies are implemented, and how cost effective they are.

So we basically came up with four alternatives. Number one is a no action alternative. Number two is institutional controls/long-term monitoring. Number three would be a groundwater collection and treatment. And number four would be enhanced groundwater bioremediation.

For alternative one, which is a no action alternative, basically we evaluated to establish a baseline for comparison with the other alternatives. In this case EPA takes no action at the site to prevent exposure to contaminated groundwater.

Number two, alternative two, which is institutional control/long-term monitoring, we, in this case, we would implement what we call a classification exemption area to prevent future use of groundwater within the boundary of the site.

What this basically means is, that through New Jersey DEP we would define a certain area at the site or around the site and put restrictions within that area. So, it would be a case where nobody could -- could install a new portable well and get exposed to contaminants from the groundwater.

And also for this alternative, we would be sampling and analyzing VOCs from all 47 existing monitoring wells on site for -- 1, 4-dioxene from

10 wells and metals from three wells. Also, continuing with alternative two, the monitoring well data, we will use that to assess the migration and the attenuation of groundwater contamination over time, and plan for remedial action if required.

We would also review, do a review of site conditions every five years to determine if long-term monitoring should be discontinued. And in this case, the monitoring program would be performed over a 30-year period.

For alternative three, they extracted groundwater, would be extracting groundwater from five extraction wells to capture the ten part per billion plume. In all, we would be extracting the groundwater at the rate of 280-gallons per minute.

We would be treating the groundwater basically by these different processes, and then also the treated groundwater would be discharged either to surface water via the storm sewer, or it would be reinjected back into this, the ground. We would also do long-term monitoring and periodic site reviews.

We would also for alternative four now, this is what is called enhanced groundwater bioremediation. And basically what we found or what has been happening at some of the sites, is that the chlorinated solvent can be degraded, as I mentioned earlier, using both aerobic and anaerobic process. The anaerobic process reuses the chlorination, also known as EAB. And in this case this process does not have any -- any oxygen. The aerobic process has oxygen.

Okay. For the bioremediation continued with it, it would be implemented -- bioremediation to be implemented will be based on the outcome of bench scale treatability study, which would be performed during the remedial design. Implementation is similar for both technologies with the exception of actual amendments to be delivered to the subsurface.

This picture or slide gives an idea of what the aerobic process is. And as I mentioned, TCE is a main contaminant there, and in this case what we would be doing is adding methane gas, we would be adding bugs, such as -- which has enzymes, and the reaction -- the reaction will take place. And in the end we would end up with carbondioxide, water and chloride. And these are all nontoxic materials.

Okay. Given that the contaminants presented at the site are chlorinated solvent, we found that EAB is a viable alternative for remediating these contaminants. However, given that the aquifer is aerobic with low organic carbon, aerobic co-metal bolism would be appropriate.

Bioremediation alternative includes both possibilities as a bench scale study will be conducted during the pre-design phase to determine the best approach.

Okay. For all four alternatives these are the costs that are involved, and how long they would have to be performed.

For alternative one, we would be doing nothing, it would cost nothing, and the duration would be no time.

Alternative two, a total cost would have been $975,000. Alternative three, total cost would be 5,400,000 and it will take 25 years. Alternative four which is the bioremediation, it would be 7,250,000 and would last for 15 years.

Based on the proposed plan

which we have in the back, our preferred alternative is the enhanced bioremediation. It achieves the remediation objective within 15 years, achieves the most reduction in the toxicity due to the combination of ex-situ treatment and enhanced in-situ bioremediation.

Long-term monitoring of the groundwater will be implemented to protect human health and the environment, and institutional controls will also be implemented.

That's it in a nutshell, and we are open for questions and answers.

MS. LONEY: We only ask that if you are going to ask the question, since this is a public meeting and we are documenting the meeting, we ask that you just state your name for the record.

MS. FRENCH: My name is Claire French. I'm the Monmouth County clerk, and tonight I'm representing the Water Resources Association for the County, that I'm a member of. In the '70s and '80s I was mayor of Wall Township and very involved in Monitor Devices, and a great disappointment that it brought to our community.

At the same time I was on advisory board for the New Jersey Water Supply Authority and our concern was, of course, building the reservoir in the vicinity, and did the footprints or any future footprint effect that -- we were satisfied that it didn't.

We were pleased at the time to see that the footprint didn't -- didn't threaten any water supply, since our well is a distance away. I think it's a mile, even though there's a water tower that's much closer. I don't know if the water tower is indicated on the map or not.

There are a couple of little -- just items that I noticed.

One is you have the reference Lakewood Industrial Park. I don't think there's anything up there called Lakewood Industrial Park, so I think you should correct that. I think at the time it was called Harris Industrial Park. Also Air Cruiser is now Zodiak. Again, owned by a foreign company.

But one of the things that they use that company for is and they always have, they make portable hospitals canvas products, and used for emergency slides and rafts for the air industry, and they do have a big -- a big pool.

And what they do is if they -- if they have a new raft to experiment with, that they pump water into it and then all the employees get to jump in the raft and make sure that their quality control is up to speed and nothing happens to the raft.

I only mention that because in

looking at the footprint, you know, it looks like it takes that property in the -- in maybe the second level of contamination on the footprint, I'm not sure. I don't know whether they will -- when they pump groundwater -- or whether from a well, or whether they use city water. I wanted to raise that as a thought.

MR. ROBINSON: I think they use city water, but we have a Air Cruiser representative here, or a Zodiak representative.

MR. MELNICK: I'm Steve Melnick, M-e-l-n-i-c-k, and I work for Air Cruiser. To answer that one question, that pool is only there -- it was originally there for fire supression -- the pool was there for fire supression, and was there originally as part of the sprinkler system for the company. There was two 130,000-gallon tanks that are still in there, empty, in the building, and that pool is obsolete, just so you know. And we are on a city water system.

MS. FRENCH: I thought tonight I might be speaking out on his behalf because, again, you did point out in your presentation, that in the area of the footprint possible contamination for workers on the ground, but we're well represented by Zodia tonight.

Also, I wanted to ask a question in the alternate number two. Does the 30-year period that you talk about start now, or was it implemented years ago?

MR. ROBINSON: The 30-year period will start once we choose a remedy, do the -- once -- after the remedy has been chosen, designed and implemented. So, it's going to start in the future, a year, two, three years down the road. Once it's implemented.

MS. FRENCH: Also, you know,

the county has been considering and actually working toward purchasing the airport. Since 1977, when the Monitor Devices was first discovered, Mr. Rahmani, the owner of the airport has done a lot of excavation on the airport site. And if you have been up there you probably have noticed that. The whole runway has been -- actually I don't know how many feet I would guess at, but if you're ground level and a plane takes off it looks like underground.

Just a question, do you as representatives of the EPA, how often do you go to look at what is happening up there or what kind of changes that have taken place, that may or may not effect that footprint?

MR. ROBINSON: Well, we, you know, our job is basically at this point is to characterize the contamination at the airport. And based on where we stand now, the contamination is not on the runway part of this, so we don't go over that side.

MS. FRENCH: So even if that elevation is dropped considerably, it wouldn't effect the footprint; is that what you're saying?

MR. ROBINSON: No, because we would be looking at the groundwater aquifer. And we have background wells there, and it shows that the flow, the groundwater flow is towards the east, and not towards the runway. And I don't know if Grant wants to talk a little bit more on that issue?

MR. ANDERSON: Groundwater flow generally follows a subdued expression of the topography. So when the topography goes from high to low you can generally assume that the groundwater flow below it goes from high to low as well. So the airport has been built up. The runways have been elevated, and where the runways are elevated they will actually create groundwater flow directions away from that.

MS. FRENCH: But the elevation of the runway is not built up -- the runway itself has been not built up, it has been mined out. And while I understand your thought about the elevations, certainly the aquifers don't always follow that rule.

MR. ANDERSON: An unconfined aquifer generally does follow that rule. And we -- it has been confirmed at this site too. We have a lot of groundwater flow information. And we know to a high degree, certainly which way the groundwater is flowing. And it's generally flowing to the east away from the airport runway.

MS. FRENCH: Which is good. Again, my interest is just as a citizen to, since I still live in Wall Township, and most of you that are studying this and coming up with all these alternative probably weren't born when this all started. Most of you. I would like to also mention that I appreciate very much your analysis of the alternatives, and I am pleased with, you know, recommending alternatives.

And I am freezing. So, if you don't have any questions for me I'm going home where it's nice and warm. But again, I thank you so much for coming to town and having this hearing right here. I'm disappointed that more people don't come, because this is very important. This is -- this is a big story to Wall Township. The press should be covering this, and also recognizing the work that you're putting into the solution. So, thank you very much.

MR. ROBINSON: Thank you.

MS. FRENCH: And congratulations to all of you on your work on this project.

MR. MELNICK: I have a question for you. Do you know where you're going to put these wells in -- the ejection and extraction wells?

MR. ROBINSON: I will let Tom or Ali.

MR. RAHMANI: We have primary location of those extraction and ejection wells, which will be defined during our investigation.

MR. MELNICK: I was just curious to see if there --

MR. RAHMANI: It is shown on one of the drawings in the FFS, feasibility study -- report.

MR. MELNICK: My own question is, I wanted to know how it was going to effect us and our property; if there's anything in the future that's going to be on site for us that would be a hinderance to our business as well?

MR. ROBINSON: I don't -- I think we have enough area there to put extraction and ejection wells, and I don't foresee us having to put any on Zodiak's property.

MR. MELNICK: I know there have been existing wells there in the past.

MR. ROBINSON: We have sampled existing wells.

MR. MELNICK: That was my only question.

MR. ROBINSON: Thank you.

MS. LONEY: Half of the public is gone, and the other half is on its way out. So I guess this ends the public meeting unless, there is no unless. Thank you for coming and good night.

(Whereupon, the meeting concluded at 7:00 p.m.)

C E R T I F I C A T E

STATE OF NEW YORK)
) ss.
COUNTY OF NEW YORK)

I, Jamie I. Moskowitz, a Shorthand (Stenotype) Reporter and Notary Public of the State of New York, do hereby certify that the foregoing Meeting, of the Monitor Devices, taken at the time and place aforesaid, is a true and correct transcription of my shorthand notes.

I further certify that I am neither counsel for nor related to any party to said action, nor in any way interested in the result or outcome thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 12th day of September 2005.

Jamie Ilyse Moskowitz

Jamie Ilyse Moskowitz, CSR, RPR, CRR
License No. XI01658