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EPA Superfund
Record of Decision:

FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER (USDOT)
EPA ID: NJ9690510020
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ATLANTIC COUNTY, NJ
09/20/1996

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Area B - Navy Fire Test Facility
FAA Technical Center

FACILITY NAME AND LOCATION

Federal Aviation Administration (FAA) Technical Center, Atlantic County
Atlantic City International Airport, New Jersey

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Area B, the Navy Fire Test Facility, at the FAA Technical Center, Atlantic City International Airport, New Jersey. The remedial action decision was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and,to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative record for Area B.

The Commissioner of the New Jersey Department of Environmental Protection and the Pinelands Commission concur with the selected remedy (Appendix A).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial threat to public health, welfare, or the environment. Area B, the Navy Fire Test Facility, was used for aircraft fire training in the late 1950s and 1960s which resulted in ground water contamination due to releases of hydrocarbon products containing hazardous substances and volatile organic compounds.

DESCRIPTION OF THE SELECTED REMEDY AND CONTINGENCY REMEDY

The selected remedy for Area B addresses the principal threat by treating contaminated ground water. The selected remedy for Area B includes the following components:

- Installation of additional monitoring wells;
- Continued ground water and surface water monitoring;
- Installation and operation of air sparging wells, vapor extraction wells and monitoring probes;
- On-site vapor treatment (if necessary); - and
- Five year reviews.

If additional subsurface investigations indicate that the selected remedy is unsuitable for application at Area B, a contingency remedy will be employed. The contingency remedy for Area B includes the following components:

- Installation of additional monitoring wells;
- Continued ground water and surface water monitoring;

- Installation and operation of product/ground water extraction wells;

- Physical separation of product and off-site transport for incineration;

- On-site ground water treatment by air stripping;

- Discharge of treated water back into the shallow ground water; and

- Five year reviews.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

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DECISION SUMMARY
RECORD OF DECISION
Area B - Navy Fire Test Facility
FAA Technical Center

I. SITE NAME, LOCATION AND DESCRIPTION

The FAA Technical Center encompasses an area of approximately 5,000 acres in Atlantic County, New Jersey, eight miles northwest of Atlantic City. Among the installations on the property are the Atlantic City International Air Terminal, the New Jersey Air National Guard 177th Fighter Interceptor Group, the Upper Atlantic City Reservoir, the Laurel Memorial Park Cemetery and the extensive facilities of the FAA Technical Center. Atlantic City's municipal water supply is provided by nine ground water production wells located just north of the Upper Atlantic City Reservoir on FAA property as well as by water drawn directly from the Atlantic City Reservoirs. The reservoirs are fed by the North and South Branches of Doughty's Mill Stream, which traverse portions of the FAA Technical Center grounds. The public water supply facilities on site are owned by the Atlantic City Municipal Utilities Authority (ACMUA).

The FAA Technical Center is located within the Atlantic Coastal Plain, a broad, flat plain which encompasses the southern three-fifths of New Jersey. The area within two miles of the FAA Technical Center has a maximum relief of about 65 feet, ranging from an elevation of ten feet above mean sea level (msl) at the Lower Atlantic City Reservoir to 75 feet msl to the west and north of the airport The facility itself is relatively flat-, slopes generally range from 0 to 3 percent. Forested areas exist north, south, and east of the airport runways. These areas comprise about 40% of the 5,000- acre FAA Technical Center property. The remaining 60% of the site has been cleared for FAA facilities and consists of buildings and paved surfaces, grassed lawns and native grassland and shrubs adjacent to the runways.

The area within one mile of the FAA Technical Center boundaries includes open or forested land and commercial and residential areas. A large forested tract containing no commercial or residential property exists west of the FAA Technical Center. To the east, the property is bordered by the Garden State Park-way, the Lower Atlantic City Reservoir, and the forested land surrounding the reservoir. The area north of the FAA Technical Center contains commercial properties along the White Horse Pike (Rt 30) and a concentrated residential area, Pomona Oaks, north of the White Horse Pike. The closest residential area south of the FAA Technical Center is a series of three trailer parks at the intersection of Tilton Road and Deliah Road. The majority of commercial and residential areas south of the FAA Technical Center are greater than 2,000 feet away from the FAA property, south of the Atlantic City Expressway. All residential areas in the vicinity of FAA appear to be upgradient or otherwise isolated from the ground water flow at the FAA Technical Center.

Area B is located near the former location of the sewage treatment plant, in the southwestern portion of the FAA property, as indicated on Figure 1, The South Branch of Doughty's Mill Stream flows from west to east along the southern portion of the area (Figure 2). The area is currently grass- covered, with a wooded area in the southern portion of the site along the stream. An unnamed road traverses the central portion of the site.

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II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use

The first significant development of what is now FAA property came during the 1930s when the Upper Atlantic City Reservoir was created by damming the South Branch of Doughty's Mill Stream. Prior to 1942, the entire property was wooded, except for the presence of large borrow pits near the present-day Research and Development (R&D) facilities. On a 1940 aerial photograph, several dirt roads and what appears to be a railroad right-of-way traverse the property. In the early 1940s, a Naval Air Base and the Atlantic City Municipal Airport, including most of the existing runways, were constructed over much of the eastern two-thirds of the property. Many of the buildings in the western built-up area were also constructed at this time. In 1958, the Navy transferred its interests to the Airways Modernization Board (AMB).

The FAA took over the operations of the AMB in November 1958. The development of most of the R&D portion of the facility south of the Upper Atlantic City Reservoir occurred in the early 1960s The FAA's large Technical/Administrative Building was constructed in 1979. The New Jersey Air National Guard has maintained their facilities at the northern ~nd of the built-up area since 1973.

Area B, referred to as the Navy Fire Test Facility, was used during the late 1950s and early 1960s for aircraft fire training. A review of historical aerial photographs indicates that the highest level of activity occurred between 1957 and 1962. During this time frame, aircraft and sections of aircraft were located throughout the area and portions of the area's ground surface exhibited dark-colored stains. By 1965, the area had been graded over. A portion of the area was later used for General Services Administration (GSA) motor pool parking. The portions of the site used for fire training and GSA motor pool parking are indicated in Figure 2.

The FAA Technical Center was listed on the National Priorities List (NPL) on August 30,1990, 55 FR 3 5502, with an effective date of October 1, 1990. The FAA entered into an Interagency Agreement (IAG) with the EPA on May 17, 1993. The IAG is a legally enforceable document that memorializes FAA's commitment to remediate the site and defines the role of EPA in the cleanup process.

B. Initial Investigations

In 1983, the New Jersey Department of Environmental Protection (NJDEP) directed Roy F. Weston (Weston) to conduct an assessment of potential pollution sources that could impact the then-proposed Atlantic City well field. The assessment included a review of all data on possible contaminant sources in the area, limited field investigation of these sources, and soil and ground water sampling at five areas considered most threatening to ground water supplies in the area. The entire FAA Technical Center was included in the Weston Study, and the five areas identified by Weston were all located on the FAA property. Weston's report led the FAA to initiate the present Environmental Investigation/Feasibility Study (EI/FS) of the five sites as well as additional areas identified by the FAA.

C. Environmental Investigation/Feasibility Study

The Area B El included six phases of Investigation conducted between December 1986 and July 1993. The scope of these investigations is described below.

Phase I

Site investigation activities conducted during the Phase I EI included a soil gas survey,

geophysical survey, surface soil sampling, subsurface soil sampling, ground water sampling, and a hydrogeological investigation, A facility-wide surface water and sediment investigation which included the collection of a surface water sample and sediment sample from the South Branch of Doughty's Mill Stream adjacent to Area B was also conducted during the Phase I EI. Each of these Phase I EI components is discussed briefly below. Figure 3 provides the Phase I EI sampling locations.

- A soil gas survey was conducted on a 100-foot grid of the area to identify potentially contaminated sods or contaminant plumes through the presence of elevated levels of volatile organic compounds (VOCs) within the soil's pore space. One small anomaly was identified in the northern comer of the site. Organic vapor concentrations in this area were only slightly elevated, ranging from 38 ppm to 260 ppm.

- A geophysical survey (EM-31 and EM-34) and resistivity profiling to detect buried metal objects were also conducted during the Phase I investigation. The data were strongly influenced by cultural features, particularly the presence of power lines. All anomalies were found to be related to the presence of utilities.

- Five surface soil samples (B-SSI to B-SS5) were collected at Area B including one background sample (B-SSI). Sample B-SS-3 was collected from the center of the soil gas anomaly. Three samples, including the background sample and the one collected from the soil gas anomaly were analyzed for priority pollutants plus 40 additional peaks (PP+40). The remaining two samples were analyzed for total petroleum hydrocarbons (TPH). No priority pollutant VOCs or semi-volatile organic compounds (SVOCs) were detected in the samples analyzed for PP+40, although the pesticide 4,4'-DDT and inorganics were detected in the samples. The two samples analyzed for TPH each exhibited the presence of TPH compounds.

- Four 30-foot deep sod borings were drilled to define the vertical extent of contamination and site geology. One subsurface soil sample was collected from each boring location. The sample from one boring, B-B3, was analyzed for PP+40, while the remaining three samples were analyzed for TPH. Polychlorinatcd biphenyls (PCBs) and inorganics were detected in the sample analyzed for PP+40. Low levels of TPH were detected in the other subsurface samples.

- Three shallow monitoring wells were also installed during the Phase I EI to obtain stratigraphic, hydrogeologic and ground water quality data. One well (B-MWIS) was located upgradient of the site to serve as a background well and two wells (B-MW2S and B-MW3S) were located in the downgradient portion of the site, between the suspected fire fighting area and the South Branch of Doughty's Mill Stream. All ground water samples were submitted for PP+40 analysis. Ethylbenzene and 4,4'-DDT were the only priority pollutant organics detected, both in well B-MW3S. Inorganics (chromium, copper, mercury, lead, and zinc) were also detected in varying concentrations in the ground water samples. Subsequent to the completion of the Phase I studies, the presence of an 8-inch thick floating hydrocarbon product layer (hereinafter referred to as "floating product" or "product") was identified in well B-MW3S.

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- One surface water sample and one sediment sample were collected during the Phase I EI from the South Branch of Doughty's MH Stream adjacent to Area B and were analyzed for PP+40. No priority pollutant compounds were detected in the surface water sample. Tetrachloroethene, trichloroethene, 4,4'-DDT, and inorganics including chromium, lead, zinc and mercury were detected in the sediment sample.

- Hydrogeologic investigations indicated that the top 30 feet of soils at Area B are dominated by fine to medium sands with only minor amounts of silt and clay. At B-MWIS, north and upgradient of the area, the soils consist of fine to very fine sands with a substantial percentage of silt. Based on the boring log for production well FAA-5, located 1000 feet northwest of Area B, the Upper Cohansey Clay is absent, with the first substantial confining layer being the thirty-foot-thick Middle Cohansey Clay layer encountered at a depth of 95 feet. The water table at Area B was encountered at depths of 4 feet to 17 feet during the Phase I EI. Ground water flow at the site is roughly south-southwest toward the South Branch of Doughty's Mill Stream.

Phase II

During the Phase II investigation conducted in late 1988, twelve soil borings were drilled to further investigate the extent and chemical nature of the floating product detected in well B-MW3S. Figure 4 provides the Phase II EI sampling locations. Eleven 10- to 12-foot deep soil borings were drilled within 50 to 75 feet of well B-MW3S to define the extent of subsurface contamination on the basis of field headspace measurements. An additional boring was drilled upgradient of well B-MW3S to investigate upgradient subsurface soil quality. A soil sample was collected for PP+40 and TPH analyses. Floating product was sampled for PP+40 analysis, gas chromatograph (GC) fingerprinting, and physical parameters. A ground water sample was also collected from beneath the floating product layer in B-MW3 S for priority pollutant VOC analysis.

- The areal extent of the subsurface contamination associated with the floating product was defined by plotting the locations of elevated subsurface soil headspace readings for the soil samples collected from the twelve soil borings, as indicated in Figure 4. The subsurface area of elevated headspace readings measured approximately 30 feet by 50 feet. No upgradient source area was identified through the chemical analysis of a subsurface soil sample collected from an upgradlent soil boring.

- The product sample exhibited an odor characteristic of a mixture of gasoline and kerosene. Chemical analysis of a floating product sample indicated that its chromatogram most closely resembles that of gasoline, Xylene, chlorobenzene, and ethylbenzene were identified as the main components in the priority pollutant analysis of the product sample.

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- Ethylbenzene was the only priority pollutant VOC detected in the ground water sample from beneath the product layer in well B-MW3S.

Supplemental Investigation

A Supplemental Investigation was conducted in September 1989 at Area B to further define subsurface soil quality in the area of the floating product, since no subsurface soil samples were collected from the floating product area for priority pollutant chemical analysis during previous investigations. The scope of the Supplemental Investigation included the drilling of two soil borings and the collection of three subsurface soil samples for priority pollutant analysis. One boring, B-B17, was drilled within 6 feet of existing monitoring well B-MW3S, with soil samples collected at the water table (8- to 10-foot interval) and in the zone 2- to 4- feet above the water table (4- to 6-foot interval). The second boring, B-B 18, was drilled 13 feet southeast of B-MW3, with a soil sample collected at the water table (8- to 10-foot interval). The supplemental soil boring locations are presented in Figure 5. Analysis of the subsurface

soil samples identified the presence of di-n-butylphthalate, both VOC and SVOC tentatively identified compounds (TICs), 4,4-DDT, chromium, and lead.

Although monitoring well B-MW3S was not resampled during the Supplemental Investigation, the product thickness was monitored prior to and during the investigation period. In June 1989, a product thickness of 0.5 inches was measured in the well. In November 1989, no measurable thickness of product could be identified in the well. Due to the relatively thin layer of product measured in the well and the documented tendency for floating product to accumulate in wells to thicknesses greater than are present in the surrounding aquifer, seasonal variations in water level could account for the product's periodic absence from the well during this period.

Additional Investigations

In August 1992, additional investigations were conducted to determine if the stained soils or aircraft areas visible in the historic aerial photographs, as indicated in Figure 6, could be a potential source of contamination at Area B. A Hydropunch sampling system, which consists of a patented drive tube and sampler capable of collecting a ground wat er sample without the installation of a monitoring well, was used. Ten shallow ground water samples were collected for drinking water VOC analysis Chloroform, benzene, tetrachloroethene, 1,2,4-trimethylbenzene and 1,2-dichlorobenzene were detected at five of the ten locations at trace to low levels. However, no consistent pattern of contamination was noted and no potential source of the floating product was identified. Approximately 3 inches of floating product were measured in well B-MW3S during this investigation.

To further define the nature and extent of dissolved ground water contamination, two additional monitoring wells (B-MW4S and B-MWSS) were installed downgradient of B-MW3S, adjacent to the South Branch of Doughty's Mill Stream during January 1993. Ground water samples were collected from the new wells and existing well B-MW3 S for organic and inorganic analyses.

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The locations of the new wells are provided in Figure 6. During this investigation, a product thickness of approximately 2 inches was measured in well B-MW3S. The ground water sample collected from beneath the product layer in well B-N1W3S exhibited the presence of aromatic hydrocarbons, 4-methylphenol, naphthalene, VOC and SVOC TICs, arsenic, zinc and phenol. The presence of 4,4'-DDT ih the ground water at this location, as indicated by the Phase I EI results, was not confirmed. In the two newly installed downgradient wells, several chlorinated hydrocarbons, including 1,1-dichloroetliene, trichloroethene, and tetrachloroethene, SVOC TICs, heptachlor epoxide, arsenic, and mercury were detected.

In May 1993, wells B-MW4S and B-MW5S were resampled and three surface water samples were collected from the South Branch of Doughty's Mill Stream for VOC analysis. The analysis of ground water samples from wells B-MW4S and B-N4W5S confirmed the presence of chlorinated hydrocarbons at levels similar to those detected during the January 1993 investigation. No VOCs were detected in the surface water samples at levels above laboratory detection limits.

A Geoprobe ground water investigation was subsequently conducted in July 1993 to further define the extent of the floating product plume as well as the nature and extent of the dissolved ground water contamination upgradlent and downgradient of B-N4W3S. Similar to the Hydropunch investigation system, the Geoprobe sampling system allows for the collection of ground water samples without the installation of monitoring wells. A total of 26 Geoprobe locations were sampled in the area near and between B-MW3S and the South Branch of Doughty's Mill Stream Geoprobe locations are indicated in Figure 7. While aromatic and chlorinated hydrocarbon

compounds were detected at varying levels within the Geoprobe ground water samples, there was no consistent pattern of contamination apparent in the sample results, with the exception of the detection of aromatic hydrocarbons and the identification of a thin product layer at Geoprobe, location GP-15 Based on the Geoprobe' results, the estimated product area was plotted as shown in Figure 7.

Immediately following the Geoprobe investigation, two monitoring wells (B-MW7S and B-MW9S) were installed near Geoprobe locations which exhibited elevated VOC levels, a third monitoring well (B-MW8S) was installed upgradient of B-MW3S, and a fourth monitoring well (B-MW6S) was installed on the south side of the South Branch of Doughty's Mill Stream. The locations of these wells are indicated in Figure 7. Concurrent with monitoring well installation, five subsurface soil samples (including one duplicate sample) were collected and analyzed for priority pollutant VOCs but exhibited no detectable contamination. In August 1993, the four new wells and existing wells B-MW4S and B-MW5S were sampled and three surface water samples were collected from the South Branch. No upgradient source of contamination was identified and no VOCs were detected in the surface water samples, Xylene was the only aromatic hydrocarbon detected and was present only in well B-MW4S. Chlorinated VOCs were detected in wells B-MW4S, B-MWSS, B-MW6S and B-MW7S. The presence of chlorinated hydrocarbons at low levels of 2 parts per billion (ppb) or less was detected in well B-MMS, located south of the South Branch. Its presence may be attributable to residues of contaminant migration which occurred prior to channelization of the stream. The South Branch was channelized north of its natural location sometime between 1957 and 1961, based on a review of historic aerial photographs. Based on ground water and surface water elevations measured during site investigations, the South Branch is considered to be a "gaining" stream, that is, ground water discharges to the stream. If contamination was present before the channelization of the stream, contaminants may have migrated toward the stream's original location. It is possible that the presence of VOCs in well B-MW6S reflects the remnants of residual dissolved ground water contamination that may have migrated to this location prior to the diversion of the stream flow. This hypothesis is supported by the fact that the area surrounding B-MW6S is undeveloped and wooded, with no other potential sources of such contamination evident.

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Quarterly ground water sampling of the monitoring wells and surface water sampling locations indicated in Figure 8, which has been conducted since December 1993, has verified the results of the site investigations described above.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

A newspaper notification of the availability of the Proposed Plan for Area B was published in the Atlantic Citv Press on April 11, 1996. The notice invited the public to comment on the EI/FS and Proposed Plan. The public comment period was held from April 11 through May 10, 1996. The Proposed Plan and EI/FS Reports were placed in the administrative record maintained at the Atlantic County Library.

A public meeting was held on May 2, 1996 at the Atlantic County Library. At the meeting, representatives from the FAA, FAA's environmental consultant (TRC Environmental Corporation), U-S Environmental Protect ion Agency (EPA), and New Jersey Department of Environmental Protection (NJDEP) were available to answer questions about Area B. The attendance list from the meeting is attached (see Appendix B). No comments on the Proposed Plan were received during the public comment period, as noted in the Responsiveness Summary, which follows this Decision Summary.

This decision document presents the selected remedial action alternative for Area B of the FAA

Technical Center in Atlantic County, New Jersey, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the NCP. The decision for Area B is based on the administrative record.

IV. SCOPE AND ROLE OF RESPONSE ACTION

Area B poses a principal threat to human health and the environment according to NJDEP's risk criteria. Risk assessment findings, the presence of ground water contaminants at levels which exceed state drinking water and ground water quality standards, hydrogeologic conditions and the presence of floating product layer containing hazardous substances provide the basis for the selected ground water remedial action. Surface water and sediment quality within the South Branch of Doughty's Mill Stream will be addressed witMn a separate operable unit, as necessary.

It should be noted that Area B represents only one of more than 20 areas of potential environ.mental concern identified at the FAA Technical Center. This document addresses only Area B, and is not intended to address the entire FAA property. The other areas of concern at the FAA Technical Center will be subject to separate response action decisions.

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V. SUMMARY OF SITE CHARACTERISTICS

The EI identified the presence of constituents in soils and ground water at Area B which appear to be mainly attributable to contarruination in the vicinity of monitoring well B-MW3S, where free product was detected. The samples collected and analyzed during the field investigations provide an overview of contaminant types and distributions.

For each environmental medium or potential contaminant source (e.g., soil, ground water, product, surface water and sediment) sampled, detected concentrations of contaminants are summarized and evaluated against appropriate chemical-specific applicable or relevant and appropriate requirements (ARARs) and to-be-considered criteria.(TBCs) below.

Soil

During the EI activities at Area B, five surface soil samples and twelve subsurface soil samples were collected for chemical analysis. The only volatile organic priority pollutants detected were methylene chloride in surface soil samples and methylene chloride, toluene and trichlorofluoromethane in subsurface soil samples. Methylene chloride, considered by the EPA as a common laboratory contaminant, was also detected in blank samples associated with the subsurface soil samples at levels which exceeded 10% of the highest level detected in the subsurface soil samples. Therefore, methylene chloride was eliminated from the set of subsurface soil sample results. The maximum detected concentrations of methylene chloride in surface soils and toluene and trichiorofluoromethane in subsurface soils ranged from 0.002 ppm to 0.014 ppm. Total VOC concentrations, including VOC TICs, ranged from a maximum of 0.06 ppm in surface soils to 1.2 ppm in subsurface soils. VOC TICS detected in surface soil samples included 1, 1, 2-trichloro-1,2,2-trifluoroethane (which was also present in the field blank) while VOC TICs detected in subsurface soils included acetone and unknown eicosyne, ethanol, and cyclohexane.

SVOC priority pollutant compounds detected in soils at Area B include 1,2,4-trichlorobenzene, di-n-butylphthalate, naphthalene, di-n-octylphthalate, bis (2-ethylhexyl) phthalate and butylbenzylphthalate. 1,2,4-Trichlorobenzene and di-n-butylphthalate were each detected in only one surface soil sample at estimated concentrations of 0.30 ppm and 0.042 ppm, respectively. Di-n-butylphthalate was also detected in one Phase II EI subsurface soil sample at a concentration of 0. 050 ppm and in three Supplemental Investigation subsurface soil samples at

concentrations ranging from 0.38 ppm to2.6 ppm. However, the presence of di-n-butylphthalate in a Supplemental Investigation method blank at a concentration of 1.6 ppm allows for the elimination of di-n-butylphthalate from the Supplemental Investigation subsurface soil data set. Naphthalene, di-n-octylphthalate and butylbenzylphthalate were each detected in a single subsurface soil sample at concentrations of 0.053 ppm, 0,062 ppm, and 0.31 ppm, respectively. Bis(2-ethylhexyl)phthalate was detected in two subsurface soil samples at concentrations of 0.069 ppm. and 0.40 ppm. Tentatively identified SVOC compounds were detected in surface and subsurface soil samples collected during each of the investigations. The SVOC TICs primarily consisted of unknowns, with alkanes, methyl-2-hexanone, hexadecanoic acid and aldol condensate.

One Phase I subsurface soil sample, B-133-5, collected at a depth of 8 to 10 feet, exhibited 0. 74 ppm of the PCB Aroclor 1242. No other soil samples collected at Area B contained any PCB compounds. The pesticides 4,4'-DDT and 4,4'-DDE were detected in three surface soil samples and in one subsurface soil sample at concentrations ranging firom 0.0073 pprn to 0.35 ppm.

Inorganics detected in the Area B surface and subsurface soils include arsenic, cadmium, chromium, copper, lead, mercury, and zinc. Lead was detected in each surface and subsurface soil sample analyzed for priority pollutants during each investigation. Concentrations of lead ranged from 1.6 ppm to 6.8 ppm. Chromium was detected in six of eight samples while zinc was detected in five of eight samples. Three samples contained arsenic, three samples contained copper, two samples contained cadmium, and one sample contained mercury.

Soil contaminant levels were compared to the most stringent of NJDEP's soil cleanup criteria, including residential soil cleanup criteria, non-residential soil cleanup criteria and impact to ground water soil cleanup criteria. Federal guidance levels against which soil contaminant levels were compared include the TSCA PCB Spill Cleanup Policy (Subpart G, 40 CFR 761.120 through 761.135) and the Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (OSWER Directive 9355.4-12). The PCB Spill Cleanup Policy establishes a PCB cleanup level of 10 ppm for soils to a minimum depth of 10 inches in nonrestricted access areas. This level is applicable to spills of materials containing PCBs at concentrations of 50 ppm or greater which occurred afler May 4, 1987. While not applicable to Area B, this cleanup level was considered in the evaluation of PCB levels in surface soils at the site. The Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities sets forth a screening level for lead in soil of 400 ppm, based on residential exposure. This guidance was also considered in the evaluation of surface soil contamination at the site.

The only constituents detected in surface or subsurface soil samples at levels which exceed state or federal guidance levels are PCBs and cadmium. The PCB Aroclor 1242 was detected in a single subsurface soil sample at a level of 0.74 ppm, which exceeds the New Jersey residential soil cleanup criterion of 0.49 ppm. However, based on its detection within a subsurface soil sample collected at a depth of 8 to 10 feet, direct exposure to the soil is considered to be highly unlikely. Therefore, PCBs in soil are not considered to represent a human health or environmental concern. Cadmium was detected in three of four surface soil. samples at levels exceeding the February 1994 New Jersev residential soil cleanup criterion of l ppm. However, NJDEP is currently revising the cadmium residential soil cleanup criterion to a value of 39 ppm. Therefore, cadmium in soil is not considered to represent a human health or environmental concern.

Ground Water

Ground water samples were collected from a total of nine monitoring wells at Area B during the Environmental Investigations or quarterly ground water sampling events. Constituents detected in ground water at Area B include VOCs, SVOC TICs, and inorganics. Floating product was also identified in monitoring well B-MW3S, located in the southern portion of the site. High

levels of VOCs and SVOC TICs were detected in a sample of the product. These results are discussed in more detail by chemical class in the following sections.

During the Phase I investigation, priority pollutant volatile organics detected in the ground water samples collected from wells B-MW1S, B-MW2S and B-MW3S included methylene chloride, chloroform, 1,1,1-trichloroethane, and ethylbenzene. Methylene chloride was detected in each of the three ground water samples but was also detected in associated blank samples. Based on the blank concentrations, methylene chloride was eliminated from the set of sample results. Chloroform and 1, 1, 1 -trichloroethane were each detected in monitoring well B-MW2S at estimated concentrations of 1 ppb. During the Phase II EI, following the identification of floating product in well B-MW3S, the ground water sample collected from beneath the floating product layer exhibited ethylbenzene at 550 ppb, methylene chloride at 2,500 ppb, and total xylenes at 3,700 ppb. Additional investigations involving the installation of six additional monitoring wells and quarterly ground water sampling identified the presence of additional priority pollutant volatile organic compounds in the ground water at Area B. In these investigations, monitoring wells B-MWlS and B-MW2S were not resampled. Monitoring well B-MW3S, sampled only in February 1993, exhibited total xylenes at 2,300 ppb, ethylbenzene at 340 ppb and toluene at 26 ppb. Monitoring well B-MW8S, located upgradient of B-MW3 S, and monitoring well B-MW9S, located sidegradient of B-MW3S, exhibited no analytically valid VOC constituents. Wells B-MW4S, B-MW5S and B-MW7S, located downgradient of well B-MW3S, did not exhibit the presence of aromatic hydrocarbons, with the exception of xylene and ethylbenzene, both detected during the May 1993 sampling round in well B-MW4S. Wells B-MW4S, B-MW5S and B-MW6S have, however, exhibited the presence of other compounds (primanily chlorinated compounds), including the following constituents detected at the ranges noted.

Acetone	Not detected (ND) to 12 ppb
Carbon disulfide	ND to 0.2 ppb
1, 1 -Dichloroethene	ND to 16 ppb
1, 1 -Dichloroethane	ND to 22 ppb
cis- 1,2-Dichloroethene	ND to 2 ppb
Chloroform	ND to 0.9 ppb
1, 1, 1 -Trichloroethane	ND to 6 ppb
Trichloroethene	ND to 4 ppb
Tetrachloroethene	ND to 45 ppb
1,2-Dichloropropane	ND to 0.7 ppb
1,2-Dichloropropene	ND to 0.6 ppb
VOC TICs	ND to 114 ppb

Trace levels of several chlorinated compounds have also been detected in well B-MW6S, which is located on the south side of the South Branch of Doughty's NEII Stream, at the following levels:

Chloroform	ND to I ppb
Bromochloromethane	ND to 0.6 ppb
1,1,1 -Trichloroethane	ND to 0.8 ppb
Trichloroethene	0.5 to 2 ppb
Tetrachloroethene	ND to 0.9 ppb

To try to identify the source of ground water contamination, single-event ground water samples were also collected for VOC analysis during the Hydropunch investigation in areas of the site upgradient of well B-MW3S which were historically used for fire training. The detection of trace to low levels of VOCs at 5 of 10 sampling locations was generally inconsistent with respect to types of contaminants and locations relative to past site activities. Single-event ground water samples collected for VOC analysis in the immediate vicinity of B-MW3 S during the Geoprobe

investigation further delineated the extent of product in the area immediately surrounding B-MW3S. In general, a source of the aromatic and chlorinated hydrocarbon contamination detected in the ground water at Area B was not identified by the extensive site investigations, although the extent of contamination was delineated.

VOC analysis of the product sample collected during the Phase II EI identified the presence of high levels of xylene (1.1%), ethylbenzene (0.16%), chlorobenzene (0.093%), toluene (0.01%) and TICs (20 2%), consisting of cycloalkanes, alkanes and unknowns, within the product.

SVOC, pesticide/PCB and inorganic analyses of ground water samples were only conducted during the Phase I EI at wells B-MW1S, B-MW2S and B-MW3S and during the sampling of wells B-MW3S, B-MW4S and B-MW5S in February 1993. For SVOCs, naphthalene (5 ppb), 2-methylnaphthalene (2 ppb), and tentatively identified SVOC compounds (220 ppb) consisting of hydrocarbons and unknowns were detected in monitoring well B-MW3S during the Phase I EI. Phenol was detected in each of B-MW1S, B-MW2S and B-MW3S at concentrations ranging from 16 to 24 ppb. During the February 1993 sampling event, well B-MW3S exhibited 4-methylphenol at 12 ppb, naphthalene at 130 ppb, and tentatively identified SVOC compounds at 3,100 ppb. The SVOC TICs consisted of C2, C3, and C4 benzenes, and alkane. Tentatively identified SVOC compounds were also present in a sample and duplicate sample collected from monitoring well B-MW5S at concentrations of 54 ppb and 2 ppb, respectively. Bis(2-ethylhexyl)phthalate was also detected in each sample, but its presence in the laboratory blank resulted in the elimination of the compound from the data set.

SVOC analysis of the product sample collected during the Phase II EI identified the presence of high concentrations of naphthalene (0.086%) and tentatively identified SVOC compounds (9.7%) consisting of C3 and C4 benzenes, alkanes, and unknowns.

Low concentrations of the pesticides 4,4'-DDE and 4,4'-DDT were present in ground water samples collected at Area B during the Phase I EI. 4,4'-DDT was detected in monitoring wells B-MW1S, B-MW2S, and B-MW3S at concentrations of 0.03 ppb, 0.1 ppb, and 0.3 ppb, respectively. 4-4'-DDE was only detected in monitoring well B-MW2 S at a concentration of 0.01 ppb. Monitoring well B-MW3S was resampled for pesticides/PCBs, along with monitoring wells B-MW4S and B-MW5S in February 1993. These results did not confirm the presence of 4,4'-DDT in monitoring well B-M.W3S as detected during Phase I. Heptachlor epoxide was detected in a sample and a duplicate sample from well B-MW4S at concentrations of 0.11 ppb and 0.14 ppb, respectively. Aldrin was also detected in the duplicate sample only at a concentration of 0.091 ppb. No PCBs were detected in the ground water at Area B.

Pesticide/PCB analysis of the product sample collected during the Phase II EI identified the presence of 4,4'-DDD and 4,4'-DDT, each at a concentration of 100 ppb.

Of the inorganics detected in wells B-MW1S, B-MW2S and B-MW3S, lead and zinc were detected in all three monitoring wells at concentrations ranging from 5.2 ppb to 25 ppb, and 25.1 ppb to 64.5 ppb, respectively. While lead was detected in each of the monitoring wells, the highest level of lead was detected in background well B-MW1S. Chromium and mercury were detected in monitoring wells B-MW1S and B-MW2S at concentrations ranging from 15 ppb to 21.5 ppb and 0. 6 ppb to 0.65 ppb, respectively. Copper was detected only in well B-MW1S at a level of 27.4 ppb, During the February 1993 sampling event, zinc was the only inorganic analyte detected in each of monitoring wells B-MW3S, B-MW4S and B-MW5S at concentrations ranging from 11.0 ppb to 19.2 ppb. Mercury was detected in samples from wells B-MW4S and B-MW5S, including a duplicate sample from well B-MW4S, at concentrations ranging from 0.19 ppb to 2.2 ppb. Arsenic was detected in B-MW3S and in a duplicate sample from B-MW4S at concentrations of 3.7 ppb and 2.3 ppb, respectively.

Inorganics detected in the product sample collected from monitoring well B-MW3S included mercury at 0.55 ppb and zinc at 92.8 ppb.

Promulgated state and federal standards (i.e., federal and state Maximum Contaminant Levels and Ground Water Quality Standards) were used to evaluate ground water contamination. The New Jersey Ground Water Quality Standards state that for Class I-Pineland (Protection Area) ground water, as in the case of Area B, the ground water quality standard shall be the background water quality. Where a constituent standard (i.e., background) is of a lower concentration than the practical quantitation level (PQL), a discharge is not considered to contravene the standard as long as the ground water concentration is less than the PQL. Therefore, in the following discussions contaminant levels are compared to Maximum Contaminant Levels (MCLs), background ground water quality as defined by well B-MW1S, and PQLs.

Of the contaminants detected in the Area B ground water, eight volatile organics (ethylbenzene, methylene chloride, toluene, xylene (total), 1,1-dichloroethene, 1, 1, 1-trichloroethane, trichloroethene, and tetrachloroethene), two pesticides (4,4'-DDT and aldrin), and one inorganic (mercury) were detected at concentrations exceeding the federal or state MCLs, background ground water quality or PQLs. Ground water in the southern portion of the site exhibited VOCs (at monitoring wells B-MW3S, B-MW5S, B-MW6S and B-MW7S), 4,4'-DDT (at B-MW3S), aldrin (at B-MW4S) and mercury (B-MW5S) at levels exceeding these standards. The approximate contaminant plume area is indicated in Figure 9. At monitoring well B-MW6S, located on the south side of the South Branch, trichloroethene was detected at a level (2 ppb) which exceeds the 1 ppb PQL in only one of nine sampling rounds. Therefore, ground water to the south of the South Branch was not included in the estimated ground water plume area. Inorganics were detected in upgradjent (background) monitoring well B-MW1S and monitoring well B-MW2S, located to the east of the approximate plume area, at concentrations exceeding relevant standards during the Phase I EI; however, based on the presence of inorganics in the upgradient monitoring well, it is anticipated that site-related contamination is generally not responsible for the elevated inorganic levels at these two locations. Therefore, these wells were not included in the estimated ground water plume area.

Within the identified ground water plume area, aldrin, 4,4'-DDT and mercury were the only non-VOC contaminants which were detected at levels exceeding the MCLs, PQLs or background levels. Each compound was detected in a single ground water sample. 4,4'-DDT was present in well B-MW3S during the Phase I EI at a level of 0.3 ppb but was not detected when the well was resampled (beneath the product layer) following the Hydropunch investigations. Aldrin was detected at a level (0.091 ppb) which exceeds the PQL of 0.04 ppb, in only one of two samples. (regular sample and a duplicate sample) collected simultaneously from well B-MW4S; aldrin was not detected within the other sample. Mercury was detected in a single sample from well B-MW5S at a level of 2.2 ppb.

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Of the VOCs detected in the ground water plume area at levels exceeding MCLs or PQLs aromatic VOCs (total xylene, ethylbenzene and toluene) and methylene chloride were detected in well B-MW3S, where floating product has also been detected. Total xylene was also detected in downgradient well B-MW4S at a level which exceeds the PQL. Chlorinated VOCs were detected at levels exceeding PQLs in samples collected from monitoring wells B-MW5S and B-MW7S, located in the southern portion of the site. The PQLs for 1,1-dichloroethene, 1,1,1-trichloroethane trichloroethene, and tetrachloroethene were exceeded in well B-MW5S, and the PQL for tetrachloroethene was exceeded in well B-MW7S.

Sediment and Surface Water

During the Phase I EI, one sediment sample (SD-2) was collected from the South Branch just downgradient of Area B. Priority pollutant VOCs present in the sediment sample but not in the associated blank samples include trichloroethene at 0.007 ppm and tetrachloroethene at 0.002

ppm, VOC TICs, comprised of unknown hydrocarbons, were also detected at a total concentration of 0.029 ppm in the sample, but not in the associated blank. SVOC compounds detected in the Phase I sediment sample included several polynuclear aromatic hydrocarbons (PAHs). A total PAH concentration of 1.11 ppm was detected in the sample. SVOC TICs, comprised of unknown, hydrocarbons and organics, were also detected at a total concentration of 37.5 ppm in the sample. The pesticide 4,4'-DDT was detected at a concentration of 0.16 ppm. No PCBs were detected in the sample. Inorganics detected in the Phase I sediment sample include chromium (3.4 ppm), mercury (0.98 ppm), lead (5.2 ppm), and zinc (9.6 ppm).

A comparison of the contaminant levels detected in the single sediment sample to sediment criteria values at which risks to benthic fauna are minimal was conducted within the environmental risk evaluation and is discussed further within the presentation of that effort in Section VI(B).

One surface water sample was collected for PP+40 analysis from the South Branch at the same location at which the Phase I EI sample was collected. Surface water sampling has also been conducted on a quarterly basis since May 1993 at three locations along the South Branch at Area B, with the quarterly surface water samples analyzed for priority pollutant VOCs only. During the Phase I EI, no priority pollutant VOCs were detected in the surface water sample although an unknown VOC TIC was present at a concentration of 8 ppb. Only one priority pollutant VOC, acetone, has been detected in the quarterly surface water samples. During the May 1993 sampling round, acetone was detected in surface water sample B-SW2 at a concentration of 9 ppb. No priority pollutant SVOC, pesticide, PCB or inorganic analytes were detected in the surface water sample collected during the Phase I EI, with the exception of inorganic phenol, detected at 5.6 ppb. A tentatively identified SVOC compound consisting of an unknown organic was also present at a concentration of 4 ppb.

In summary, contaminants detected in surface water samples have been limited to acetone, present in one sample at a level of 9 ppb, inorganic phenol at 5.6 ppb, one tentatively identified VOC at 8 ppb and one tentatively identified SVOC at 4 ppb. No chemical-specific ARARs/TBCs were identified as being applicable to these contaminants; therefore, no formal comparison is made herein.

Additional characterization of the South Branch in the vicinity of Area B is being conducted under a study managed by the U S Fish and Wildlife Service, as described in Section VI(B).

VI. SUMMARY OF SITE RISKS

A baseline risk assessment was conducted based upon the results of the EI for Area B to estimate the potential risks associated with current and future land uses. The baseline risk assessment estimates the human health and ecological risks which could result from contamination at the site if no remedial action was taken. A summary of the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) is presented below. A more complete description can be found in the Draft Final Risk Assessment, Area B, Navy Fire Test Facility (TRC, October 1994).

A. Human Health Risk Assessment

The HHRA consisted of a four-step process to assess the potential site-related human health risks under both current and potential future exposure scenarios. The four-step process included hazard identification, exposure assessment, toxicity assessment, and risk characterization and is summarized below. Constituent release mechanisms from the environmental media, based on relevant hydrologic and hydrogeologic information (fate and transport and other pertinent site-specific information), were also presented in the HHRA.

Hazard Identification

The hazard idenlification involved the selection of the constituents of concern (COCs), the detected constituents which have inherent toxic/carcinogenic effects that are likely to pose the greatest concern with respect to the protection of human health. The COCs for Area B were chosen for the media of interest (surface soil, subsurface soil and ground water) based upon the detection frequency of the constituents and, for inorganics in soil only, based upon a comparison to background data. The COCs selected in the Area B HHRA are listed in Table 1. Sediment data were not included in the HHRA due to the low concentrations detected and the low potential for FAA workers to come into contact with the sediments.

Exposure Assessment

The exposure assessment identified the potential pathways and routes for COCs to reach potential receptors, estimated the constituent concentrations at the points of exposure, and characterized the extent of the potential exposures.

TABLE 1
CONSTITUENTS OF POTENTIAL CONCERN
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

10 SURFACE SOIL

6 INORGANICS
- Arsenic
- Cadmium
- Chromium
- Copper
- Lead
- Zinc

2 SEMIVOLATILES
- Di- n- butyl phthaiate
- Trichlorobenzene, 1,2,4-

2 PESTICIDES
- DDE, 4,4'-
- DDT, 4,4'-

14 SUBSURFACE SOIL

6 INORGANICS
- Arsenic
- Chromium
- Copper
- Lead
- Mercury
- Zinc

1 VOLATILES
- Toluene

4 SEMIVOLATILIES
- Bis(2-ethylhexyl)phthalate
- Butylbenzylphthalate
- Di-n-octylphthalate
- Naphthalene

2 PESTICIDES
- DDE, 4,4'-
- DDT, 4,4'-

1 PCBs
- Aroclor 1242

27 GROUND WATER

6 INORGANICS
- Arsenic
- Chromium
- Copper
- Lead
- Mercury
- Zinc

14 VOLATILES
- Acetone
- Bromochloromethane
- Chloroform
- Dichloroethane, 1,1-
- Dichloroethene, 1,1-
- Dichloroethene, 1,2-(cis)
- Dichloropropane, 1,2-
- Ethylbenzene
- Methylene chloride
- Tetrachloroethene
- Toluene
- Trichloroethane, 1,1,1-
- Trichloroethene
- Xylene (total)

4 SEMIVOLATILES
- Methylnaphthalene,2-
- Methylphenol, 4-
- Naphthalene
- Phenol

3 PESTICIDES
- DDE, 4,4'
- DDT, 4,4'
- Heptachlor epoxide

Current and anticipated future uses of Area B were evaluated. The current and future receptor populations were characterized as being essentially limited to government employees. Currently, Area B is not widely used by FAA employees either for work or recreational purposes, and there is no current use of ground water at Area B. However, incidental exposure could occur as a result of activities such as atypical work assignments which could require the presence of a person at the site. Therefore, under the current FAA worker scenario, adult government employees were assumed to be exposed through ingestion of and dermal contact with COCs in surface soils. Specifically, FAA employees were modeled as being exposed to surface soils for 10 days/year, as a result of activities such as atypical work assignments which could require the presence of a person at the site, over a period of 25 years (representative of career length at one location). These exposures could potentially involve contact with soil, which is modeled by a soil ingestion rate of 50 milligrams (mg) per day and a dermal contact rate of 500 mg per day.

Since the use of Area B is not anticipated to change in the foreseeable future, adult government employees were also identified as one of the future receptor populations. In the future use commercial/industrial scenario, adult workers were modeled by a soil ingestion rate of 50 mg per day, a soil dermal contact rate of 500 mg per day, and a ground water ingestion rate of 1 liter of ground water per day, for 250 days per year over a period of 25 years. Future construction workers were assumed to be exposed to COCs in subsurface soil through ingestion and dermal contact. Specifically, workers exposed to subsurface soil (at depths of two to ten feet) were modeled as potentially ingesting 480 mg of subsurface soil per day and receiving dermal contact with 1,000 mg of subsurface soil per day for 250 days over a period of one year.

Exposure point concentrations (EPCs) were calculated for each COC based upon a statistical method which uses a confidence interval (i.e., the 95% upper confidence limit or UCL) to calculate a theoretical concentration from actual data, per EPA guidance. Use of this method provides reasonable confidence that the true site average will not be underestimated. That is, the probability that the actual average concentration on the site exceeds the calculated value is estimated to be less than 5%. When few data points are available for statistical analysis (e.g., less than 10 data points), the 95% UCL tends to be artificially inflated and exceeds the maximum detected concentration. In these cases, the maximum detected value was used as the EPC rather than the 95% UCL.

Toxicity Assessment

The toxicity assessment summarizes the types of adverse health effects associated with exposures to each COC and the relationship between magnitude of exposure (dose) and severity of toxic effect (response). The dose-response values used in the HHRA were obtained from the EPA's Integrated Risk Information System (IRIS) database or EPA's Health Effects Assessment Summary Tables (HEAST). The toxicity values used in the HHRA are summarized in Tables II 3-1, II 3-2 and II 3-3 of the HHRA.

Cancer slope factors have been developed by EPA for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. Slope factors, which are expressed in units of 1/(mg/kg-day) (i.e., risk per unit intake or dose), are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative nature of the slope factor. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors generally are derived from the results of human epidemiological studies or chronic animal bioassays.

Reference doses (RfDs) have been developed by EPA for indicating whether adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects may be of concern. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans,

including sensitive individuals, that are likely to be without an appreciable risk of adverse health effects. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse' noncarcinogenic effects to occur.

Risk Characterization

The risk characterization combines the estimates of exposure with the dose-response (or toxicity) values to derive estimates of the potential cancer risks and to determine whether non-cancer health effects may be a concern.

Excess lifetime cancer risks were determined for each COC by multiplying the estimated intake or dose by the appropriate cancer slope factor. The resulting cancer risk estimates are expressed as a probability (e.g., 1 x 10 -6 or one in a million) and indicate (using this example), that an average individual is likely to have a one in a million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of constituents. Thus, the COC-specific cancer risks were summed to estimate pathway-specific cancer risks. The pathway-specific cancer risks were then summed to estimate scenario-specific cancer risks.

The potential concern for noncarcinogenic effects of a single COC in a single medium was determined through the use of the hazard quotient (HQ) (or the ratio of the estimated exposure intake or dose to the RfD). The HQ is expressed in numeric form such that an HQ of 0.5, for example, means that the estimated exposure intake or dose is half of the RfD. The HQs were then summed across COCs and pathways to estimate pathway- and scenario-specific hazard indices (HIs), respectively. In general, HQs are assumed additive for constituents with similar toxic endpoints. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media with respect to noncarcinogenic effects.

The estimated cancer risks and non-cancer HIs (Table 2) were evaluated using EPA's established target cancer risk range of 10 -6 to 10 -4 for Superfund cleanups and the target HI value of less than or equal to 1. The State of New Jersey's acceptable carcinogenic risk of 10 -6 was also considered.

TABLE 2
SUMMARY OF CANCER RISKS AND NON-CANCER HIs FOR ALL SCENARIOS
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

CANCER RISKS

Pathway	Scenario 1 Current FAA Worker	Scenario 2 Future Constuction	Scenario 3 Future Commercial/Industrial
Incidental ingestion of soil	4 x 10 -8	7 x 10 -7	9 X 10 -7
Dermal contact with soil	NA	5 x 10 -8	NA
Ingestion of ground water			3 x 10 -5
Totals:	4 x 10 -8	8 x 10 -7	3 x 10 -5

NON-CANCER HIs

Pathway	Scenario 1 Current FAA Worker	Scenario 2 Future Construction	Scenario 3 Future Commercial/Industrial
Incidental ingestion of soil	0.0003	0.05	0.006
Dermal contact with soil	0.000004	NA	0.00009
Ingestion of ground water			0.4
Totals:	0.0003	0.05	0.4

= WITHIN 1 X 10-6 TO 1 X 10-4 CANCER RISK RANGE

The results of the baseline risk assessment indicated that the surface soils, subsurface soils and ground water at Area B pose an acceptable risk to human health under federal guidelines, although the future commercial/industrial use scenario poses an unacceptable risk under state guidelines due to the ground water ingestion pathway. The total carcinogenic risk associated with the current use scenario for surface soil ingestion and dermal contact was estimated to be 4 x 10-8. The total carcinogenic risk associated with the future use construction scenario for subsurface soil ingestion and dermal contact was estimated to be 8 x 10-7 . The total carcinogenic risk associated with the future use commercial/industrial scenario for ground water ingestion and surface soil exposures was estimated to be 3 x 10 -5, which exceeds the state's acceptable risk guideline of l x l 0-6. The risk value is attributable to the estimated risk associated with the ingestion of ground water. Arsenic and methvlene chloride were the primary contributors to the ingestion of ground water pathway risk. The total HI, which reflects noncarcinogenic effects for a human receptor, was estimated to be 0.0003 for surface soil ingestion and dermal contact under the current use scenario. Under the future use scenarios. hazard indices were estimated to be 0.05 for subsurface soil ingestion and dermal contact combined, and 0.4 for ground water ingestion and surface soil exposures combined.

B. Ecological Risk Assessment

The ERA consisted of a four-step process to assess site-related ecological risks- The four-step process included problem formulation, exposure assessment, stressor-response assessment, and risk characterization and is summarized below.

Problem Formulation

Problem formulation included relating the quantitative and spatial extent of constituents, to key habitats to determine what receptors may be at greatest potential risk, scoping the approach for assessing these risks, and selecting COCs for detailed analysis. Surface soils, sediments and surface water were determined to be the media of most concern with respect to ecological effects. Subsurface soil and ground water were not considered to be potential sources of exposure to terrestrial receptors. Sediment data available at the time the ERA was conducted was limited to a single sample. Additional sediment and surface water sampling being conducted as part of a facility-wide ecological assessment by the U.S. Fish and Wildlife Service (USFWS) under an Interagency Agreement between USFWS and the FAA will be used to further evaluate both sediment and surface water quality. Therefore, while potential risks associated with sediments and surface water were considered within the ERA, sediments and surface water are not specifically addressed within this Record of Decision but will be evaluated as a separate operable unit, as necessary, upon completion of the USFWS study.

The Area B surface soil COCs included trichlorobenzene, di-n-butylphthalate, DDT, DDE, arsenic, cadmium chromium, copper, lead, and zinc. The sediment COCs included tetrachloroethene, trichloroethene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, DDT, chromium mercury and zinc. Based on the lack of detection of analytes in the South Branch surface water samples, no COCs were selected for this medium.

The respective ecological receptors (plant or animal species or habitat) modeled as potentially being exposed to these COCs include the following:

- Deer mouse, due to its likely presence in the grassland portion of Area B, its ingestion of insects and vegetation, and its consumption by higher order species;

- White-tailed deer, due to its documented presence at the FAA Technical Center and herbivorous nature;

- Red fox, due to its tendency to prey on small mammals and vegetation;

- American woodcock, due to its identification at the facility, consumption of earthworms and small spatial range and its use as a surrogate for three protected species identified through a Natural Heritage Database Search for the immediate vicinity of Area B- the grasshopper sparrow (a state threatened species), the vesper sparrow (a state endangered species) and the upland sandpiper (a state threatened species); and
- Broad-winged hawk, due to its consumption of small mammals, amphibians, reptiles, and occasionally young birds and its potential for experiencing biomagnification.

Exposure Assessment

The exposure assessment provides a determination of which pathways are most likely to produce significant exposures to selected indicator species and the derivation of estimates of the daily exposure dose indicator species would obtain from on-site COCs- Major exposure pathways that were evaluated for the Area B indicator species included the following:

- Deer mouse - dermal contact with soil and ingestion-of vegetation, insects, and soil;

- White-tailed deer -dermal contact with soil and ingestion of vegetation and soil;

- Red fox - dermal contact with soil and ingestion of deer mice, vegetation, and soil

- American woodcock - dermal contact with soil and ingestion of earthworms and soil;

- Broad-winged hawk - ingestion of deer mice and soil.

Stressor-Response Assessment

The stressor-response assessment requires the development of an understanding of COC potency for indicator species via a review of pertinent laboratory or field toxicity studies and the linking of COC concentrations to potential effects on ecological receptors. The sensitive toxic effects (e.g., developmental, neurological, etc.) on mammalian and avian receptors were considered for each COC and benchmark doses were identified, typically based on the lowest observable adverse effect level (LOAEL) or no observable adverse effect level (NOAEL) pertinent to the indicator species. For the evaluation of sediments, sediment quality criteria values at which risks to benthic fauna are minimal were identified.

Risk Characterization

The risk characterization involves a comparison of exposure doses to benchmark doses to estimate the potential for adverse effects. By dividing the exposure dose by the ecological benchmark dose for a specific COC, the ecological hazard quotient (EHQ) is calculated. An EHQ of less than 1 indicates minimal potential for ecological harm, an EHQ of between 1 and 10 indicates a low potential for ecological effects, an EHQ of between 10 and 100 indicates a moderate potential for ecological effects and an EHQ of greater than 100 indicates a significant potential for ecological impacts. EHQ values are summed across COCs when exposure occurs within the same receptor, although the assumption of additivity may not be appropriate in situations where the type of toxic effect (e.g., target organ) differs. The estimated EHQs for soil-related exposures at Area B are summarized in Table 3 while the estimated EHQs for sediment exposures are summarized in Table 4.

The results of the ERA indicate that Area B poses a generally low order of risk for terrestrial receptors, with estimated risks below a level of concern (EHQ of less than 1) for deer, fox, and

hawk, and slight1y elevated above the low potential risk range (EHQ of 1 to 10) for mouse (EHQ = 12) and woodcock (EHQ = 11). Inorganics (cadmium and chromium, respectively) contributed the most to the estimated risks for mouse and woodcock. For sediments, the risk assessment identified a significant risk (EHQ = 170) to benthic communities due to the presence of DDT and a low potential for ecological effects due to the presence of mercury. However, as previously discussed, sediments will be addressed within a separate operable unit, as necessary, following completion of USFWS studies.

C. Risk Summary

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

VII. REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment; they specify the COCs, exposure route(s), receptor(s), and acceptable contaminant level(s) for each exposure route. These objectives are based on available information and standards such as ARARs and risk-based levels established in the risk assessment.

A Feasibility Study (FS) serves as the mechanism for the development, screening, and detailed evaluation of remedial alternatives for all environmental media affected at a site. The FS for Area B (TRC, 1995) established the objectives for remedial actions at Area B, as follows:

- Prevent exposure, due to ground water ingestion, to ground water contaminants which are present at levels exceeding state and federal drinking water standards and New Jersey Ground Water Quality Standards. Ground water remediation levels will be the more stringent of state and federal drinking water standards and New Jersey Ground Water Quality Standards.

- Prevent Migration and discharge of ground water contaniinants to the South Branch of Doughty's Mill Stream and restore ground water quality; and

- Prevent exposure to and migration of free product contaminants from the vicinity of well B-MW3S.

TABLE 3

SUMMARY OF EHQS FOR SOIL-RELATED EXPOSURES
TERRESTRIAL/AVIAN RECEPTORS
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

COC	Mouse	Woodcock	Deer	Fox	Hawk
Inorganics					
Arsenic	0.82	0.13	0.00063	0.001	0.00072
Cadmium	5.5	2.1	0.0045	0.0039	0.018
Chromium	0.24	5.2	0.00017	0.00049	0.033
Copper	2.0	1.0	0.0016	0.0045	0.084
Lead	1.3	0.99	0.001	0.0012	0.0031
Zinc	1.2	0.18	0.001	0.020	0.50
Semi-Volatiles					
Di-n-butylphthalate	0.0042	0.022	0.0000032	0.000011	0.00022
Tricholorobenzene	0.93	1.6	0.00074	0.00075	0.0055
Pesticides					
DDE	0.045	0.27	0.000085	0.00063	0.0057
DDT	0.11	0.035	0.000035	0.00038	0.0036
Total EHQ	12	11	0.0098	0.033	0.66

Bold sigruifies EHQ values > 1.

TABLE 4

SUMMARY OF EHQS FOR SEDIMENT EXPOSURES
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

COC	Sediment Concentration A	SQC C	EHQ C
Inorganics			
Chromium	3.4	80	0.043
Mercury	0.98	0.15	6.5
Zinc	9.6	120	0.080
Volatile Organics			
Tetrachloroethene	0.002	0.4	0.0050
Trichloroethene	0.007	4.0	0.28
Semi-Volatile Organics			
Benzo(a)pyrene	0.11	16	0.0069
Benzo(b)fluoranthene	0.22	50	0.0044
Chrysene	0.14	47	0.0030
Fluorantene	0.31	9.0	0.034
Phenanthrene	0.16	2.6	0.062
Pyrene	0.17	19	0.0090
Total PAHs	1.11	4.0	0.28
Pesticides			
DDT	0.16	0.001	160
Total Sediment EHQ			170

A Sediment concentrations expressed as mg chemical per kg sediment (dry weight basis).

B Sediment quality criteria are in units of mg chemical per kg sediment (dry weight basis) adjusted for the fraction organic carbon of South Branch sediments.

C Bold signifies EHQ values > 1.

VIII. DESCRIPTION OF THE ALTERNATIVES

CERCLA §121(b)(1), 42 U.S. C.§9621 (b)(1), mandates that a remedial action must be protective of human health and the environment, be 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, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA §121 (d), 42 U.S.C. §9621 (d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621 (d)(4).

The Area B FS (TRC, 1995) evaluated six remedial alternatives for addressing the volatile organic ground water contamination associated with Area B. The remediation of other ground water constituents detected at levels exceeding drinking water standards or New Jersey Ground Water Quality Standards was not assessed within the FS due to the lack of confirmation of their actual presence in subsequent sampling rounds or their presence in both on-site and upgradient (background) monitoring wells. An initial screening of the six alternatives was conducted based on the alternatives' effectiveness, implementability and cost. On the basis of the initial screening, five alternatives were considered to provide the greatest degree of compliance with the screening criteria and were retained for detailed analysis. Alternative 2, consisting of well permit restrictions and capping, was eliminated because it is not effective in preventing the migration of ground water contaminants. The remedial alternatives which were evaluated in detail (Alternatives 1, 3, 4, 5 and 6) are described below. Included among these alternatives is the no action alternative (Alternative 1).

Alternative 1 - No Action with Ground Water and Surface Water Monitoring

Capital Cost: $4,200
O&M Cost: $180,000
Present Worth Cost: $220,000
Construction Time: One month

The Superfund program requires that the "no action" alternative be considered as a baseline for comparison of other alternatives. The no action alternative involves no remedial actions to reduce the toxicity, mobility or volume of contamination at Area B. The site would remain in its present condition. Included in-this alternative is the installation of two additional shallow monitoring wells on the south side of the South Branch and continued ground water and surface water monitoring to identify, off-site migration of ground water contamination, should it occur. Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the hazardous substances.

Alternative 3 - Product/Ground Water Extraction, Product Treatment Off-Site (Incineration), Ground Water Treatment On-Site(Air Stripping)

Capital Cost: $130,000
O&M Cost: $450,000
Present Worth Cost: $690,000
Construction Time: Eight months

Alternative 3 consists of the installation of two additional shallow monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring,

installation and operation of product/ground water extraction wells, physical separation of product and off-site transport for incineration. on-site ground water treatment by air stripping, and discharge of treated water back into the shallow ground water. Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the hazardous substances.

Alternative 4 - Product/Ground Water Extraction, Product Treatment Off-Site (Incineration), Ground Water Treatment On-Site (LTV Oxidation)

Capital Cost: $310,000
O&M Cost: $560.000
Present Worth Cost: $1,000,000
Construction Time: Twelve months

Alternative 4 consists of the installation of two additional shallow monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of product/ground water extraction wells, physical separation of product and off-site transport for incineration, on-site ground water treatment by UV oxidation, and discharge of treated water back into the shallow ground water. Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the hazardous substances.

Alternative 5 - Product/Ground Water Extractiom Product Treatment Off-Site (Incineration), Ground Water Treatment On-Site (Cross-Flow Pervaporation)

Capital Cost: $340,000
O&M Cost: $730,000
Present Worth Cost: $1,300,000
Construction Time: Twelve to fifteen months

Alternative 5 consists of the installation of two additional shallow monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of product/ground water extraction wells, physical separation of product and off-site transport for incineration, on-site ground water treatment by cross-flow pervaporation, and discharge of treated water back into the shallow ground water. Based on the innovative nature of the cross-flow pervaporation technology, the availability of full-scale treatment units is very limited and treatability studies would be required prior to implementation. Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the hazardous substances.

Alternative 6 - In Situ Treatment (Air Sparging/Vapor Extraction)

Capital Cost: $510,000
O&M Cost: $450,000
Present Worth Cost: $1,200,000
Construction Time: Twelve to fifteen months

Alternative 6 consists of the installation of two additional shallow monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of an air sparging/vapor extraction system and associated monitoring probes, and on-site vapor treatment (if necessary). The air sparging/vapor extraction system

would volatilize and remove both free product contamination and dissolved ground water contaminants, thereby providing an alternative means of product remediation. Due to the inconsistent detection of a separate product layer observed during the EI, in situ treatment may be more effective than separate phase extraction in removing the product from the subsurface. Unlike pump-and-treat alternatives involving separate phase extraction where product residuals could remain in the soil following product removal, thereby acting as a continued source of ground water contamination and extending the operational period of a treatment systern, the air sparging/vapor extraction system would be effective in removing product residuals and therefore could result in a shorter remedial time-frame. However, additional information on the flow dynamics of air through the saturated and unsaturated zones would be required prior to the design and implementation of an air sparging/vapor extraction system. If design studies indicate that separate phase product recovery is feasible and would accelerate the cleanup of the product, product extraction and off-site incineration would be incorporated as a component of this alternative. Because this alternative would result in contaminants remaining on-site, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the hazardous substances.

IX. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The five alternatives identified in Section VIII were initially evaluated on the basis of technical effectiveness and feasibility, public health and environmental effects, institutional issues, and costs, as presented in the Feasibility Study. Subsequently these alternatives were also evaluated using the criteria derived from the National Contingency Plan (NCP) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), as presented in the Proposed Plan. These criteria relate to the SARA amendment to Section 121 of CERCLA [Section 121(b)(1)] and Section 300.430(e)(9)(iii) of the NCP and are as follows:

- Overall protection. of human health and the. environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.

- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

- State acceptance indicates whether, based on its review of the EI/FS reports and Proposed Plan, the State concurs, opposes, or has no comment on the preferred alternative at the present time.

- Community acceptance refers to the public's general response to the alternatives described in the Proposed Plan and the EI/FS reports. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

Alternatives 3, 4, 5, and 6 each provide a significant degree of protecion of human health and the environment through their active ground water and product treatment processes. Although subsurface soil contaminant levels do not exceed ARARs or TBCs, treatment of product residuals in the subsurface soils is offered under Alternative 6, versus Alternatives 3, 4, and 5, where

product residuals may remain in the subsurface soil following product removal and could be a continuing source of ground water contamination. Therefore, Alternative 6 provides the greatest overall protection of human health and the environment by treating ground water and product residuals. Of the pump-and-treat alternatives (Alternatives 3, 4, and 5), Alternative 3 provides the greatest overall protection of human health and the environment through its demonstrated ability to treat the ground water contaminants. Alternative 1 provides the least overall protection of human health and the environment because it does not eliminate, reduce, or control the contaminated media.

Compliance with ARARs

Alternatives 3, 4, 5, and 6 would each be designed and operated with the intent of meeting volatile organic drinking water and ground water quality standards. Chemical-specific ARARs for VOCs in ground water are considered to be achievable for Alternatives 3, 4, 5, and 6. Alternative 3 is most likely to achieve these requirements based on the proven nature of the air stripping technology. A greater degree of uncertainty is associated with the ability of Alternatives 4 and 5 to meet these requirements due to Alternative 4's reduced effectiveness in treating single-bonded hydrocarbons and the innovative nature of Alternative 5. A degree of uncertainty is also associated with the ability of Alternative 6 to provide uniform treatment throughout the aquifer, due to its in situ nature. Alternatives 3, 4, 5, and 6 would each be designed and operated in accordance with action-specific ARARs. Alternative 1 would not attain chemicall-specific. ARARs for contarminants detected in ground water due to the lack of product/ground water treatment. For all of the alternatives, compliance with the appropriate location-specific wetland and floodplain regulati6ns would be required.

Long-Term Effectiveness and Permanence

Alternative 6 results in the least residual, untreated hazardous substances, due to its potential for providing treatment of product residuals in the subsurface soils and the general lack of treatment system residuals associated with its operation, and is considered to offer the greatest potential for long-term effectiveness and permanence. Alternatives 3, 4 and 5 are also expected to provide good long-term effectiveness with respect to ground water treatment. The air stripping technology of Alternative 3 offers the greatest degree of certainty with respect to long-term effectiveness and permanence, due to the proven nature of its treatment technology and its lack of treatment residuals. Alternative 1 offers no protection against contaminated ground water migration and therefore is not considered to be effective in the long-term.

Reduction in Toxicity, Mobility, or Volume

Alternative 6 provides the greatest potential reduction of toxicity, mobility, or volume through the treatment of the floating product and its residuals, and treatment of the ground water.

Alternative 6 reduces the contaminants' mobility and toxicity through the air sparging/vapor extraction system, and includes an off-gas treatment system if necessary to comply with ARARs, Alternatives 3, 4 and 5 provide a reduction in contamination similar to Alternative 6, except for the product residuals within the subsurface soils, which are not addressed. The ground water treatment technologies reduce the toxicity and volume of contamination while product extraction and incineration reduce the toxicity of the floating product. Alternative 1 provides no reduction in toxicity, mobility or volume of any contaminated media through treatment.

Short-Term Effectiveness

The no action alternative can be considered to be effective in the short-term because it

involves no remediation and, therefore, no disturbance of existing contamination or increased short-term risks. However, while no increases in risk result in the short-term, remedial response objectives are not achieved. For alternatives that involve site remediation, Alternative 3 provides the greatest short-term effectiveness, providing a means of complying with remedial action objectives within a short time frame with minimal risk incurred. Alternative 4 also would be relatively effective in the short-term although LTV oxidation treatment systems are not as widely available as air strippers and, therefore, the time required for implementation could be longer. Alternatives 5 and 6 require the longest implementation period, due to the need for treatability testing and additional site characterization prior to implementation. The additional time required for implementation of Alternative 6 could potentially be offset by a shorter operation and maintenance period, due is ability to treat product residuals in the soils.

Implementability

Alternative 1 is the most implementable of the alternatives due to the very limited site activities associated with its implementation. Ground water monitoring well installation and ground water and surface water sampling are all easily implemented. Alternative 3 is the most easily implemented alternative which involves remediation of the product and ground water because it utilizes readily available and well-proven treatment technologies. Alternatives 4 and 6 would follow in terms of implementability, due to the increasingly innovative nature of the technologies involved and more limited availability of vendors who provide the technology. Alternative 5 would be the most difficult alternative to implement, due to the lack of readily available full-scale treatment systems and the need for treatability studies prior to start-up.

Cost

Total present worth cost estimates for alternative implementation range from $220,000 to $1,300,000- The lowest cost alternative is the no action alternative ($220,000) with Alternative 3 being the next costly alternative to implement ($6,90,000). Alternatives 4, 5 and 6 cost $1,000,000, $1,300,000 and $1,200,000, respectively, to implement.

In terms of capital cost, Alternative 1 is lowest in cost, with Alternatives 3, 4, 5 and 6 following in order of increased capital costs. Capital costs range from $4,200 for Alternative 1 to $510,000 for Alternative 6. Alternative 1 also offers the lowest present worth operation and maintenance (O&M) cost ($180,000). Alternatives 3 and 6 are comparable in terms of present worth O&M cost, each estimated at $450,000. Alternatives 4 and 5 offer increasing higher present worth O&M costs, at $560,000 and $730,000, respectively.

State Acceptance

The selected remedy and contingency remedy, as discussed in the following section, are acceptable to NJDEP.

Community Acceptance

Based upon the concerns and comments received during the public comment period and public meeting, the community accepts the preferred alternative as presented in the Proposed Plan. Public concerns and comments are presented in the Responsiveness Summary of this ROD.

X. SELECTED REMEDY

Based upon an evaluation of the various alternatives, the FAA, in consultation with the EPA, has selected Alternative 6 as the Area B ground water remedy, with Alternative 3 as a

contingency remedy. Alternative 6 consists of the installation of two additional shallow monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of air sparging wells, vapor extraction wells, and monitoring probes, and on-site vapor treatment (if necessary). Additional site-specific studies must be conducted to further define the applicability of this technology to subsurface conditions at Area B. If pre-design studies indicate that separate phase product recovery would be implementable in combination with air sparging/vapor extraction and would accelerate the cleanup process, product extraction and off-site incineration would be incorporated as a component of this alternative. Pre-design will also include the performance of two rounds of ground water sampling at wells B-MW2S and B-MW5S for inorganic analyses to further investigate the potential of elevated inorganics levels at these two locations and to supplement the existing inorganic ground water data base. If pre-design studies indicate that air sparging/ vapor extraction is not suitable for implementation at the site due to subsurface conditions or is not likely to meet ARARs, Alternative 3 is the selected contingency remedy. Alternative 3 consists of the installation of two additional shallow monitoring. wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of product/ground water extraction wells, physical separation of product and off-site transport for incineration, on-site ground water treatment by air stripping, and discharge of treated water back into the shallow ground water. Additional pre-design studies would be required to support the design of Alternative 3 and would require approximately four additional months to complete. If the additional pre-design ground water sampling indicates that inorganic treatment is necessary to meet ARARs, it will be incorporated as a component of the contingency remedy.

The selected alternative is protective of human health and the environment based on the active remediation of product and ground water contamination and the ability of the treatment system to provide treatment of any product residuals in the soil. Its treatment technologies are expected to meet final remediation goals. Because of its potential for treating product residuals, it is also expected to achieve remedial goals in a shorter time frame than a pump-and-treat alternative. The alternative is also effective in the short-term, based on its use of readily available materials. It is expected to be effective and permanent in the long-term, based on the proven nature of the basic air stripping technology which is applied in situ in air sparging, and based on the potential treatment of product residuals within the soil. However, until additional site-specific studies are conducted to further define the applicability of this technology to the subsurface conditions at Area B, there is a degree of uncertainty associated with the alternative's long-term effectiveness in terms of its ability to provide uniform treatment. The alternative utilizes treatment to reduce the mobility and toxicity of the product and contaminated ground water. It also utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. While Alternative 6 is one of the more costly alternatives, it is considered to be cost-effective based on the added degree of overall protection of human health and the environment that it offers through its treatment of subsurface residuals and shorter remedial time frame.

The selected alternative will provide the best balance of trade-offs among alternatives with respect to the evaluation criteria. The FAA, in consultation with the EPA, believes the selected alternative will be protective of human health and the environment, will comply with ARARs, will be cost effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

If Alternative 6 is determined to be unsuitable for application at Area B based on further investigations of subsurface conditions and their effect on the implementation of an air sparging/vapor extraction system, Alternative 3 will be employed as a contingency remedy. Since Alternative 3 utilizes the same basic treatment technology applied ex situ rather than in situ, it is expected to offer a similar degree of effectiveness in treating ground water contaminants.

It is more easily implemented than the other ground water treatment technologies, better proven in terms of its ability to treat the contaminants of concern and the most cost-effective of the remaining treatment technologies.

The selected alternative for soil is no action. Soil contaminant levels do not exceed New Jersey non-residential sod cleanup criteria (TBCs) and no significant human health and environmental risks are associated with exposures to site soils. Therefore, it has been determined that the soils are protective of human health and the environment.

XI. STATUTORY DETERMINATIONS

Under Section 121 of CERCLA and Section 300-430(f) of the NCP, selected remedies must meet certain statutory and regulatory requirements. These requirements and a description of how the selected remedy and contingency remedy satisfy each requirement are presented below.

Protection of Human Health and the Environment

The selected remedy provides the greatest overall protection of human health and the environment by providing in situ treatment of ground water contamination and free product. The treatment system would be designed to comply with applicable ARARs/TBCs, would have minimal short-term risks associated with its installation and operation, and would be effective and reliable in the long-term although the ability of the alternative to maintain cleanup goals will only be confirmed through long-term monitoring. Due to the innovative nature of the treatment technology, and the variation in subsurface conditions at Area B, additional site-specific studies will be required to address the present degree of uncertainty with regard to the performance of the treatment system. The selected remedy is expected to be effective and permanent in the long-term, based on the proven nature of the basic air stripping technology which is applied in situ in air sparging, and based on the potential treatment of product residuals within the soil. It is effective in the short term, utilizing a proven treatment technology which is readily implemented. Additionally, its long-term effectiveness and permanence are expected to be good.

If the selected remedy is determined to be unsuitable for application at Area B based on further investigations of subsurface conditions, the contingency remedy will be employed. Since the contingency remedy utilizes the same basic treatment technology as the selected remedy (applied ex situ rather than in situ), it is expected to offer a similar degree of effectiveness in treating ground water contaminants. It is more easily implemented than the other ground water treatment technologies, better proven in terms of its ability to treat the contaminants of concern and the most cost-effective of the remaining treatment technologies.

Compliance with ARARs

The selected remedy or the contingency remedy, if implemented, will attain the more stringent of state and federal drinking water standards and New Jersey Ground Water Quality Standards. A summary of applicable chemical-specific, location-specific and action-specific ARARs and TBCs is presented in Table 5. Table 6 presents numerical chemical-specific ARAR values.

Pursuant to NJAC 7:9-6.5(d)(2), ground water at the FAA Technical Center is classified as Class I-PL (Protection Area). Pursuant to NJAC 7:9-6.7(b)(2), the ground water quality criteria for Class I-PL (Protection Area) shall be background water quality, as that term is defined in NJAC 7:9-6.4. The NJDEP and Pinelands Commission recognize that technical limitations exist for measuring compliance with such criteria. While the inorganic constituents listed in Table 6 have been detected in the Area B background monitoring well, the nine organic constituents listed in Table 6 have either not been detected in background ground water at the FAA Technical Center or

have been detected at concentrations which are lower than the relevant practical quantitation level (PQL), as that term is defined in NJAC 7:9-6.4, for each constituent. The background water quality for each of these constituents is, therefore, lower than the relevant PQL for each.

Pursuant to NJAC 7:9-6.9(c), where a constituent standard is of a lower concentration than the relevant PQL, NJDEP shall not consider a discharge to be causing a contravention of the New Jersey Ground Water Quality Standards for that constituent so long as the concentration of the constituent in the affected ground water is less than the relevant PQL for the constituent. The relevant PQLs for each of the nine organic constituents in ground water of concern at the FAA Technical Center are listed in Table 6.

TABLE 5

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
AND TO-BE-CONSIDERED CRITERIA (TBCs)
APPLICABLE TO THE SELECTED REMEDY
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

CHEMICAL- SPECIFIC ARARS (Also see Table 9)

- Safe Drinking Water Act
  Maximum Contaminant Levels (MCLs) [40 CFR 141.11-.16, and 141.60 -.63]
  Federal maximum permissible contaminant levels allowable for public water systems; applicable to the remediation of ground water

- NJ Safe Drinking Water Act
  NJ Maximum Contaminant Levels [NJAC 7:10-5.1-5.3]
  State maximum permissible contaminant levels allowable for public water systems; applicable to the remediation of ground water

- NJ Water Pollution Control Act
  NJ Ground Water Quality Standards [NJAC 7:9-6.7(c)]
  State-designated levels of constituents which, when not exceeded, will not prohibit or significantly impair a designated use of water. Pursuant to NJAC 7:9-6.5(d)(2), ground water at the FAA Technical Center is classified as Class I-PL (Protection Area). Pursuant to NJAC 7:9-6.7(d)(2), the ground water quality criteria for Class I-PL (Protection Area) shall be background water quality, as that term is defined in NJAC 7:9-6.4. The NJDEP and Pinelands Commission recognize that technical limitations exist for measuring compliance with such criteria. The nine organic constituents listed-in Table 6 have either not been detected in background ground water at the FAA Technical Center or have been detected at concentrations which are lower than the relevant practical quantitation level (PQL), as that term is identified in NJAC 7:9-6.4, for each constituent. The background water quality for each of these constituents is, therefore, lower than the relevant PQL. Pursuant to NJAC 7:9- 6.9(c), where a constituent standard is of a lower concentration than the relevant PQL, NJDEP shall not consider a discharge to be causing a contravention of the New Jersey Ground Water Quality Standards for that constituent so long as the concentration of the constituent in the affected ground water is less than the relevant PQL for the constituent. The relevant PQLs for each of the nine organic constituents in ground water of concern at Area B of the FAA Technical Center are listed in Table 6.

TABLE 5 (Continued)

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
AND TO-BE-CONSIDERED CRITERIA (TBCs)
APPLICABLE TO THE SELECTED REMEDY
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

LOCATION-SPECIFIC ARARS

- Safe Drinking Water Act
  Protection of Ground Water Use for Potable Water Supply [40 CFR 149]
  Protects aquifers designated as sole source aquifers from actions by federally-funded programs

- Executive Order 11990
  Protection of Wetlands
  Regulates activities conducted in a wetland area to nuinimize the destruction, loss or degradation of the wetlands
  Wetlands Construction and Management Procedures (40 CFR 6, Appendix A)
  Sets forth EPA policy for carrying out the provisions of Executive Order 11990

- Clean Water Act
  Section 404, Prohibition of Wetland Filling
  Prohibits the discharge of dredged or fill material to a wetland without a permit issued by the Corps of Engineers

- New Jersey Freshwater Wetlands Protection Act
  Regulation of Activities in and around Wetlands (NJSA 13:9B)
  Provides for the classification of freshwater wetlands and establishes permit requirements for activities which impact freshwater wetlands.

- New Jersey Freshwater Wetlands Regulations (NJAC 7:7)
  Rules Governing Implementation of Wetlands Protection Act
  Regulates alteration or disturbance in and around freshwater wetland areas

- Executive Order 11998
  Flood Plains Management (40 CFR 6, Appendix A)
  Restricts types of activities which may be conducted within a floodplain to minimize harm and preserve natural values

- New Jersey Flood Hazard Regulations
  General Standards and Procedures (NJAC 7:13; 2-3)
  Standards and procedures for permitting stream encroachment activities.

TABLE 5 (Continued)

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
AND TO-BE-CONSIDERED CRITERIA (TBCs)
APPLICABLE TO THE SELECTED REMEDY
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

LOCATION-SPECIFIC TBCs

- Pinelands Comprehensive Management Plan (NJAC 7:50)
  Establishes standards and requirements pursuant to the Pinelands Protection Act designed to promote orderly development of the Pinelands so as to preserve and protect the resources of the Pinelands, including wetland, ground water and air resources, among others.

ACTION-SPECIFIC ARARS

- Clean Air Act
  New Source Performance Standards (40 CFR 50)
  Requires Best Available Control Technology (BACT) for new sources and sets emissions limitations

- Clean Air Act
  National Emissions Standards for Hazardous Air Pollutants (40 CFR 6 1)
  Establishes emissions limitations for hazardous air pollutants

- New Jersey Air Pollution Control Regulations
  Permits and Emissions Limitations for VOCs (NJAC 7:27-16)
  Requires sources which emit VOCs be registered and permitted with the NJDEP and meet maximum allowable emissions rates and design specifications.

- NJ Water Supply Management Act
  Well Drilling Permits [NJSA 58:4A-14]
  Well Certification Forms [NJAC 7:8-3.11]
  State regulations goveming the drilling and construction of new wells

- New Jersey Water Pollution Control Act
  New Jersey Pollutant Discharge Elimination System Permit/Discharge Requirements [NJAC 7:14A-2.1]
  State standards for discharges to ground water (applicable to contingency remedy only)

- Resource Conservation and Recovery Act (RCRA)
  Identification and Listing of Hazardous Waste [40 CFR 261]
  Waste classification procedures applicable to the characterization of any waste materials generated as a result of vapor treatment, if determined to be necessary

TABLE 5 (Continued)

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
AND TO-BE-CONSIDERED CRITERIA (TBCs)
APPLICABLE TO THE SELECTED REMEDY
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

- RCRA
  Standards Applicable to Generators of Hazardous Waste [40 CFR 262]
  Requirements for manifesting, marking and reporting applicable to generators of hazardous waste; applicable if vapor treatment wastes are generated, determined to be hazardous and transported off-site

- RCRA
  Standards Applicable to Transporters of Hazardous Waste [40 CFR 263]
  Procedures for off-site shipment of hazardous materials or wastes; applicable if vapor treatment wastes are generated, determined to be hazardous and transported off-site

- Hazardous Materials Transportation Act
  Rules for Transportation of Hazardous Materials [49 CFR 171 through 179]
  Procedures for off-site shipment of hazardous materials or wastes; applicable if vapor treatment wastes are generated, determined to be hazardous and transported off-site

- NJ Solid Waste Management Act
  NJ Hazardous Waste Regulations [NJAC 7:26-8.5]
  Waste classification procedures applicable to the characterization of any waste materials generated as a result of vapor treatment, if determined to be necessary

TABLE 6

CHEMICAL-SPECIFIC ARARS APPLICABLE TO THE SELECTED REMEDY
AREA B - NAVY FIRE TEST FACILITY
FAA TECHNICAL CENTER

Ground Water Parameter	Federal ARARS (ppb) MCL (1)	State ARARS (ppb) NJMCL (2)	State ARARS (ppb) Background[PQL]	GWQS (3)
Chlorobenzene		4		[2]
1, 1 -Dichloroethene	7	2		[2]
Ethylbenzene	700			[5]
Methylene Chloride		2		[2]
Toluene	1,000			[5]
Tetrachloroethene	5	1		[1]
1, 1, 1 -Trichloroethane	20	26		[1]
Trichloroethene	5	1		[1]
Xylene (total)	10,000	44		[2]
Chromium	100			21.5
Lead	15			25
Mercury	2			0.6
Zinc				64.5

(1) MCL - Maximum Contaminant Level. National Primary Drinking Water Regulations, Final Rule

(2) Maximum Contaminant Level for Drinking Water; NJ Safe Drinking Water Act, NJAC 7:10-16.7

(3) Ground Water Quality Standards; based on Class I-PL(Protection Area), ground water quality criteria shall be the background ground water quality. Values without brackets represent background groundwater quality as defined by well B-MW1S. As discussed in the associated text, when the background water quality is lower than the Practical Quantiltation Level (PQL), a discharge will not contravene the standard so long as the concentration of the constituent is less than the relevant PQL. Therefore for constituents which have not been detected in background ground water or which were detected at concentrations which are lower than the POL, the POL is listed in brackets.

The regulations established under the Clean Air Act, the New Jersey Air Pollution Control Regulations and the New Jersey Water Supply Management Act will apply to the implementation of this alternative. If the contingency remedy is employed, compliance with the Clean Water Act and the New Jersey Pollutant Discharge Elimination System regulations will also be maintained. Resource Conservation and Recovery Act regulations and New Jersey regulations regarding the identification, generation, transportation and, management of hazardous waste have been included as ARARs to address potential waste matenials which could be generated as a result of vapor treatment, if determined to be necessary. Under both the selected remedy and the contingency remedy, compliance with the Pinelands Protection Act, including the Pinelands Comprehensive Management Plan, a TBC, and the appropriate federal and state location-specific wetland and floodplain regulations will be required due to the location of the facility within the Pinelands and the presence of delineated wetland areas and the 100-year floodplain in the vicinity of the South Branch of Doughty's Mill Stream.

Cost-Effectiveness

While the selected remedy is one of the more costly alternatives, it is considered to be cost-effective based on the added degree of overall protection of human health and the environment that it offers through its potential treatment of subsurface product residuals and shorter remedial time frame. Due to the relatively innovative nature of air sparging/vacuum extraction, published treatment costs are not wide1y available. However, costs can be estimated based on the previously provided assumptions. If, based on the completion of pilot-scale studies, design parameters change from those assumed above, the estimated cost could also vary.

The contingency remedy is also cost-effective, providing effective treatment at a slightly lower cost than the other alternatives considered.

Utilization of Permanent Solutions and Alternative Treatment Technologies

The FAA, in cooperation with the EPA, has determined that the selected remedy and the contingency remedy utilize permanent solutions and treatment technologies to the maximum extent practicable, This determination was made based on the comparative evaluation of alternatives with respect to long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost, as well as the statutory preference for treatment as a principal element and state and community acceptance.

The main difference between the remedial alternatives which underwent evaluation is associated with the type of product/ground water treatment utilized. The selected alternative provides in situ treatment of product/ground water and offers potential in situ treatment of product residuals. Therefore, it is expected to result in the achievement of remedial goals in a shorter time frame than a pump-and-treat alternative in which no residual treatment would occur. The removal of subsurface contamination is permanent. Therefore, the selected remedy's anticipated long-term effectiveness, reduction of toxicity, mobility or volume through treatment and short-term effectiveness were the most decisive factors in its selection. However, until additional site-specific studies are conducted to further define the applicability of this technology to the subsurface conditions at Area B, there is a degree of uncertainty associated with the alternative's long-term effectiveness in terms of its ability to provide uniform treatment, thereby warranting the consideration of a contingency remedy.

The contingency remedy, should it be employed, offers the best combination of long-term effectiveness, short-term effectiveness, implementability and cost of the remaining alternatives considered. The air stnipping technology included within the contingency remedy is well-proven and easily implemented while also being cost-effective. The alternative utilizes treatment to reduce the mobility and toxicity of the product and contaminated ground water. It also utilizes

permanent solutions and alternative treatment technologies to the maximum extent practicable.

Preference for Treatment as a Principal Element

The selected remedy and the contingency remedy address the principal threat which is associated with the presence of hydrocarbon product containing hazardous substances and contaminants in the ground water at levels which present unacceptable risks to human health under NJDEP risk criteria. Through the active remediation of product and ground water contamination, the remedies are expected to meet final remediation goals.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Proposed Plan for Area B was released for public comment on April 11, 1996. The Proposed Plan identified Alternative 6, In Situ Treatment (Air Sparging/Vapor Extraction) as the preferred remedy for Area B ground water. Alternative 3, Product/Ground Water Extraction, Product Treatment Off Site (Incineration), and Ground Water Treatment On Site (Air Stripping) was selected as a contingency remedy. The FAA received no written or verbal comments on the Proposed Plan, either during the public meeting or the subsequent 30-day comment period. Consequently, it has been determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary.

RESPONSIVENESS SUMMARY
RECORD OF DECISION
Area B - Navy Fire Test Facility
FAA Technical Center

The purpose of this Responsiveness Summary is to review public response to the Proposed Plan for Area B. It also documents the FAA's consideration of such comments during the decision-making process and provides answers to any major comments raised during the public comment period.

The Responsiveness Summary is divided into the following sections:

- Overview - This section briefly describes the selected remedy and any changes to the remedy from that included in the Proposed Plan for Area B.

- Background on Community Development - This section provides a summary of community interest in Area B and identifies key public issues. It also describes community relations activities conducted with respect to this area of concem.

- Summary of Major Questions and Comments - This section summarizes verbal and written comments received during the public meeting and public comment period.

I . OVERVIEW

The FAA Technical Center is located at the Atlantic City International Airport in Atlantic County, New Jersey. Area B is located near the former sewage treatment plant location at the south end of the built-up area in the western portion of the FAA property. This Responsiveness Summary addresses public response to the Proposed Plan for Area B only. The Proposed Plan and other supporting information for Area B are available for public review at the Atlantic County Library, 2 South Farragut Avenue, Mays Landing, New Jersey.

II. BACKGROUND ON COMMUNITY INVOLVEMENT

This section provides a brief history of community participation in the Environmental Investigation/Feasibility Study (EI/FS) activities conducted at Area B.

Throughout the investigation period, the EPA, NJDEP, Atlantic County Department of Health and the Pinelands Commission have been directly involved through proposal and project review and comments. Periodic meetings have been held to maintain open lines of communication and to keep all parties abreast of current activities.

On April 11, 1996, a newspaper notification was published in theAtlantic City Press inviting the public to comment on the EI/FS process and Proposed Plan. The announcement also identified the time and location of a public meeting to be held to discuss the proposed remedial action, the location of the information repository, the length of the public comment period, and the address to which written comments could be sent. Public comments were accepted from April 11 through May 10, 1996.

A public meeting was held on May 2, 1996 at the Atlantic County Library in Mays Landing, New Jersey. The Area B EI/FS results were discussed. FAA representatives included Keith C. Buch, Program Manager, Howard Kimpton, Super-visor, Environmental Section, and Gary E. Poulsen, Manager, Facility Engineering and Operations Division. Betsy Donovan, Remedial Project Manager, Federal Facilities Section represented the EPA Emergency and Remedial Response Division, and Ian Curtis, Case Manager, represented the NJDEP Bureau of Federal Case Management Sean Clancy

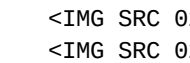
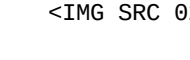
represented the Atlantic County Health Department. TRC Environmental Corporation, FAA's environmental contractor, also attended. The complete attendance list is provided as Appendix B to this Record of Decision. A transcript of the public meeting is provided as Appendix C.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS

No questions or comments with regard to the Proposed Plan for Area B were raised at the public meeting held on May 2, 1996. In addition, no written comments were received during the thirty-day public comment period following the public meeting.

APPENDIX A

NJDEP AND PINELANDS COMMISSION
LETTERS OF CONCURRENCE

September 6, 1995

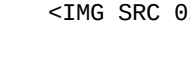
Mr. Keith Buch, COTR
FAA Technical Center
Environmental Programs Branch
Building 270, Room A117
Atlantic City International Airport, NJ 08405

Please Always Refer To
This Application Number

RE: App. No. 87-1058.17
Block 3A, Lot 2
Area B
FAA Technical Center
Egg Harbor Township

The commission has received and reviewed a copy of the Revised Draft Final Proposed Plan regarding the remediation of soils and groundwater for Area B at the FAA Technical Center. The proposed alternative for soils is no action. The proposed remedial alternative (identified as Alternative 6) for groundwater involves the installation of two additional monitoring wells on the south side of the South Branch, continued ground water and surface water monitoring, installation and operation of air sparging wells, vapor extraction wells, and monitoring probes, and on-site vapor treatment. The proposed plan indicates that the effectiveness of the proposed system will be assessed after it is operational and if necessary, an alternate remedial action will be implemented. The final plan or the ROD should specify the criteria that will be considered to determine whether on alternate remedial action is needed. Those criteria must include compliance with the standards of the Pinelands Comprehensive Management Plan.

The Proposed Plan does not raise any significant issues regarding compliance with the minimum standards of the Pinelands Comprehensive Management Plan. The remedial design must also comply with the applicable requirements of the CMP. The following information should be provided in order for the Pinelands Commission to determine whether the remedial design will comply with the applicable standards of the CMP:



1. A completed Pinelands Application (form enclosed) for the proposed groundwater remediation.

2. Provide a plan indicating the final remedial design, limits of disturbance, and the limits of wetlands on and within 300 feet of the project area.

3. Any linear development in wetlands or wetland buffers must meet the criteria outlined in N.J.A.C. 7:50-6.13 (enclosed). Linear devalcpment would include access roads or piping necessary for the remedial design. If any other development will be located in wetlands or wetland buffers, or if groundwater pumping will significantly alter the water table in the wetlands, it must be demonstrated that the proposal will be consistent with the standards of the Pinelands CMP relating to a Waiver of Strict Compliance based on a compelling public need (N.J.A.C. 7:50-4.64 et seq). These standards will require a determination that no better alternatives to the proposed exist and a determination that the proposal, when evaluated in its entirety, will result in an overall improvement of the Pinelands Area.

4. If the proposed remedial design will result in the disturbance of any fresh water wetlands it will be necessary to obtain a State Fresh Water Wetlands Permit. The Pinelands Commission is authorizing Statewide General Permits on behalf of the NJDEP in the Pinelands Area. If it is determined that the proposed project will require a Permit we will advise you of the requirements to complete a General Permit Application.

If you have any questions, please contact our development review staff.

<IMG SRC 0296272B5>

<IMG SRC 0296272B6>

April 30, 1996

Ian Curtis
NJDEP, Bureau of Federal Case Management
CN 028
401 East State Street
Trenton, NJ 08625-0028

Please Always Refer To
This Application Number

RE: App. No. 87-1058.17
Block 3A, Lot 2
Area B
FAA Technical Center
Egg Harbor Township

Dear Mr. Curtis:

The Commission staff has received and reviewed the April, 1996 Superfund Proposed Plan regarding the remediation of soils and groundwater for Area B at the FAA Technical Center.

The plan identifies the preferred alternative as alternative 6 and indicates that the effectiveness of this alternative will be re-assessed after the system is operational. As our previous letters have indicated, the criteria for assessing the effectiveness should be specified in the Final Plan or Record of Decision ROD). Those criteria must include compliance with the standards of the Pinelands Comprehensive Management Plan.

The remedial design must also comply with the applicable standards of the Pinelands Comprehensive Management Plan. Please refer to our September 6,1995 letter (enclosed) regarding Commission application requirements for the proposed remedial design.

<IMG SRC 0296272B7>

If you have any questions, please contact our development review staff.

<IMG SRC 0296272B8>

Encl(1): September 6, 1995 letter

cc: Keith Buch
Jean Oliva (with enclosure)

APPENDIX B

PUBLIC MEETING ATTENDANCE LIST

APPENDIX C
PUBLIC MEETING TRANSCRIPT

INDEX

Tape #CP-4-96, Index #0025 at 2:00 p.m.)

MR. BUCH: Hello. My name is Keith Buch. I'm the FAA-Superfund Program Manager, and welcome to today's public hearing for Area 29 and Area B. The public hearing was duly advertised in the Press of Atlantic City as requirea by the Superfund regulations. We expect that after today's public hearing to have a finalized rod within -- how many days, Jean?

MS. OLIVA: About ninety to a hundred and twenty.

MR. BUCH: Okay. And at that point we'll proceed with the final designs for the cleanup of both Area 29 and both Area B. I'd like at this point to turn the meeting over to our technical experts from TRC who have been here at the FAA Tech Center since 1986 performing all the necessary remedial investigations and feasibility studies and designs that are required to effectuate a proper Superfund Cleanup. I'd like to introduce Jean Oliva from TRC and Larry Butlien from there. I'll let Larry explain the hydrogeological background of the Area 29 and K Superfund Cleanup. Larry, would you please.

MR. BUTLIEN: Certainly. As Keith mentioned, my name is Larry Butlien and I'm the Project Hydrogeologist from TRC for the FAA project. I'd first like to very briefly present a history of how the Tech Center became involved in environmental investigation.

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In 1980 and 1981 contamination was found at the Price's Pit Landfill. This contamination also affected the Atlantic City well field which was located adjacent to Price's Pit. Price's Pit is a Superfund site which is located about three to four miles east-southeast of the Technical Center. In 1981 the New Jersey Department of Environmental Protection (NJDEP) and the Atlantic City Municipal Utility Authority (ACMUA) hired Roy F. Weston to conduct a study to relocate the well field. As a result of this study the Technical Center was-selected as the best location for the new Atlantic City well field. Between 1983 and 1984, Weston, through the New Jersey DEP, identified five areas within the Technical Center boundaries which might present a potential pollution impact to the new well field. Weston confirmed the presence of the pollutants and the New Jersey DEP issued a consent order to the Technical Center to perform the remedial investigation/feasibility study. In 1986 the FAA contracted with TRC Environmental Corporation to perform a remedial investigation/feasibility study of the Technical Center grounds. As part of the contract a complete background investigation of the Technical Center was required. A total of twenty-five areas of concern have been identified by the FAA and the U.S. Environmental Protection Agency (USEPA) that require evaluation.

All the work that TRC has performed has been in

accordance with all applicable federal and state environmental laws, statutes and regulations. The FAA has worked closely with USEPA, the New Jersey DEP, Atlantic County Health Department, and the Pinelands Commission. Each step of the investigative process has been reviewed and approved by these organizations and no work has been conducted until all necessary approvals were received.

(SLIDE PRESENTATION)

The meeting this afternoon will focus on the proposed plan for three areas: Area 29, the Fire Training Area; Area K, the Storage Area near Area 29; and Area B, the Navy Fire Test Facility. Each area will be discussed separately; Areas 29 and K will be discussed initially followed by Area B. I will discuss the background information and the results of the remedial investigation for each area, while Jean Oliva will discuss the risk evaluations conducted for each area and then will summarize the remedial alternatives for each area.

Area 29 is located northeast of the Atlantic City International Airport runways, with Area K located adjacent to Area 29. This slide also shows the locations of Area B and other areas of concern at the Technical Center.

Area 25 -- excuse me. Area 29 is referred to as the Fire Training Area. This area was constructed in the early 1970's and was used to train airport fire fighting

personnel. The area contains a 150 foot-diameter burn pad and a smaller concrete burn pad where test burns were conducted. The area also contained two underground storage tanks for the collection of run-off from the burn pads and two above ground tanks located on a small hill. The two underground tanks were emptied, removed, and disposed of off-site in an environmentally acceptable manner in December of 1988. Area K, referred to as the Storage Area near Area 29, is located across the dirt road from the burn areas at Area 29. This area was used for the storage of drums and tanks and it was reported that the drums were removed off-site in an environmentally acceptable manner from the area by the Fall of 1986.

This next slide shows the general layout of Areas 29 and K. Area 29's . boundaries are generally outlined by the triangular shaped dirt roads in the area. As you can see, at the center of Area 29 is the circular burn pad with the smaller concrete burn pad located to the north. The two former underground storage tanks that collected the burn pad run-off were located to the east of the small burn pad. The two above ground -- the two above ground tanks located on the small hill is in the western.portion of the site. Area K is located northwest of Area 29 on the northwest side of the northeast-southwest trending dirt road.

This is a photo -- this is a photograph taken

recently from the small hill looking northeast along the dirt road. The small concrete burn pad is in the center of the photograph and Area X is located on the far left-hand side of the photo.

This is a photograph taken recently from the small hill looking east toward the large circular burn pad, and note the current conditions showing standing water in the middle of the burn pad.

This is an older photograph taken in 1988 that shows the small concrete burn pad.

This photo was also taken in 1988 showing one of the underground storage tanks used for the collection of the burn pad run-off. This particular tank collected the burn pad (sic) from the large circular burn pad and had a ten thousand gallon capacity. As you can see, this tank was open-ended on the top.

This is a photograph taken in December of 1988 immediately after the ten thousand gallon tank was removed from the ground.

This final photograph shows the above ground tanks located on the small hill. The photo was taken on the west side of the hill looking toward the east.

The goal of the environmental investigations at Areas 29 and K was to determine if past site activities resulted in contamination of the site's soils and/or ground

water. The initial investigation was conducted by Roy F. Weston in 1983 as part of the Atlantic City well field relocation study. During this initial investigation, Weston installed and sampled three ground water monitoring wells of which one exhibited significant levels of organic compounds.

TRC's Phase I investigation at Areas 29 and K during 1987 included preliminary investigations including a a soil gas and a geophysical investigation. In addition, a total of sixteen surface soil samples were collected, four soil borings were drilled, two monitoring wells were installed, and a total of five ground water samples collected. Phase I analytical results indicated significant levels of organic compounds in the soils and perched ground water at the site. Specifically, polychlorinated biphenyls (PCBs) and total petroleum hydrocarbons (TPH) were identified in the soils while volatile organic compounds (VOCs) were detected in the perched water table aquifer.

This next slide shows the locations of all the Phase I sampling locations including the surface soil samples, soil borings and monitoring well locations.

During 1988 TRC conducted a Phase II investigation of Areas 29 and K. The purpose of this investigation was to further define the lateral extent of PCB contamination in the surface soils and to determine if contamination existed beneath the two underground storage tanks. These goals were

accomplished by collecting a total of seven surface soil samples and eight subsurface soil samples at the base of the tank excavations. As mentioned earlier, the two underground tanks were removed during the Phase II investigation. The Phase II results further defined the lateral extent of PCB contamination in the surface soils while elevated levels of TPH were detected in the soils beneath the ten thousand gallon storage tank.

This next slide shows the locations of the Phase II surface soil samples. Four subsurface soil samples were collected from the base of each of the two underground tanks.

Additional ground water monitoring at Area 29 was conducted in December of 1991 and a program of quarterly ground water monitoring was implemented at the site starting in May 1993 and is still ongoing today. The purpose of the additional ground water monitoring was to determine if perched ground water contamination has migrated into the underlying true water table aquifer.

The results of the various investigations at Areas 29 and K have identified a zone of perched ground water across the site. in addition, soil and ground water contamination has been identified at levels greater than current soil cleanup criteria and ground water qual.ity standards. Specifically, PCB contamination has been detected in the site's surface and subsurface soils. TPH

contamination was also identified in the subsurface soils. And finally, VOC contamination has been identified in the perched ground water aquifer above ground water quality standards. Results from the quarterly ground water sampling program have not identified contaminated ground water within the true water table aquifer at levels above ground water quality standards.

This slide shows locations of soil contamina -- where soil contamination exceeds the current soil cleanup criteria. Specifically, the areas include surface soils contaminated with PCBs in the immediate vicinity of Area K, the area surrounding the small concrete burn pad, and within the large circular burn pad. The maximum PCB level detected in the surface soils was thirty parts per million (ppm). TI NJDEP soil cleanup criteria for PCBs is two parts per million. The other area of soil contamination is at the location of the former ten thousand gallon underground storage tank. At this location the maximum level of TPH contamination was fourteen thousand ppm. The NJDEP soil cleanup criteria for total or ganics is ten thousand ppm.

As mentioned earlier, during the environmental investigations at Area 29, a zone of perched ground water was identified across the site. This perched zone was identified as underlying a significant portion of Area 29 including the circular and concrete burn pads. This slide represents a

schematic geologic cross-section of Area 29 showing the relationship between the perched and true water table aquifers. As you can see, the perched water table is situated above the true water table and is relatively limited in lateral and vertical extent. The perched ground water is formed where the soil in the unsaturated zone is locally saturated because it overlies a low-permeability silty clay or clayey silt zone situated above the true water table. During the investigation the clay unit was identified as being variable in thickness ranging between two and sixteen feet thick with the surface of the clay unit found at a depth of ten to fourteen feet below the ground surface. While ground water flow in the regional true water table aquifer was determined to be toward the east-southeast, the flow of perched ground water was estimated to be much more variable due to localized changes in the slope of the surface of the clay unit.

This slide represents an approximation of the aerial extent of ground water contamination in the perched zone where ground water quality standards have been exceeded. Ground water results from monitoring well 29-MW2S have consistently exhibited VOCs above ground water quality standards, while exceedances of ground water qualities standards have been more sporadic and periodic in monitoring well 29-MW3S.

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5-2-96

This slide represents a contour map and ground water flow direction of the true'water table aquifer. As stated earlier, the ground water flow direction in the true water table aquifer is toward the east-southeast direction as represented by contouring the water level elevations in the wells screened in the true water table aquifer.

I would now like to turn the presentation over to Jean Oliva of TRC. She will summarize the risk evaluation and the remedial action objectives associated with Areas 29 and Area K.

MS. OLIVA: Thank you, Larry. As Larry mentioned, my name is Jean Oliva and I'm a project engineer with TRC Environmental Corporation and I have been involved in feasibility study activities at the FAA Technical Center since 1989.

(SLIDE PRESENTATION CONTINUED)

Based on the results of the site investigations, a human health risk assessment was conducted to evaluate potential risks associated with exposures to soil and ground water. Ground water ingestion was evaluated even though there is no drinking water well currently located at Areas 29 or K. The risk estimated for ground water ingestion was above acceptable limits indicating that a remedial response is appropriate. A qualitative assessment of ecological risks also identified a potential risk to wildlife.

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5-2-96

Based on the results of the risk assessment and the site investigation, objectives were developed for a remedial response as listed here. In general these objectives include preventing exposures to contaminants in soil and ground water and minimizing the potential migration of these contaminants. Based on these objectives, a feasibility study was conducted.

This slide highlights the elements of a feasibility study. Initially, remedial technologies are identified and screened to determine which technologies are most appropriate for use at the site. The selected technologies are then used to develop remedial alternatives which are evaluated based on nine criteria defined in the federal regulations.

The alternatives that were developed for Areas 29 and K include a no-action alternative which must be considered based on federal regulations. The second alternative involves the placement of a cap over contaminated soils which would address potential exposures to the soils but would not address ground water contamination. The next two alternatives involve ground water extraction and treatment in combination with soil excavation and off-site disposal. The first of the two alternatives involves air stripping in which ground water contaminants are transferred to the vapor phase. The second of the two alternatives involves

carbon adsorption in which the ground water contaminants are transferred to a carbon filter media. The last two remedial alternatives employ in situ, or in-place, remedial actions which do not involve ground water extraction. They would also be combined with soil excavation and off-site disposal. The first of the two in situ remedial alternatives uses processes similar to air stripping but applies them below ground to remove contaminants from the ground water. The second alternative uses microbes to break down the ground water contamination.

Each of the remedial alternatives underwent a detailed evaluation based on the nine criteria listed here. The alternatives and their evaluations are described in more detail in the proposed plan. Compliance with the last criterion community acceptance will be determined based on is public comments which I'll discuss in more detail later in this presentation.

Based on the detailed analysis of the remedial alternatives, a preferred remedy was selected for Areas 29 and K. The preferred remedy consists of ground water extraction and treatment using carbon adsorption in combination with soil excavation and off-site disposal as well as the establishment of a Declaration of Environmental Restrictions

to ensure that future residential site development does not occur. This alternative offers the greatest overall protection of human health in the environment through its off-site disposal of contaminated soils and its ability to treat the ground water contaminants. It is also cost-effective and meets regulatory requirements.

I will now turn the presentation back to Larry Butlien of TRC who will describe the investigations that were conducted at Area B, the Navy Fire Test Facility.

Larry.

MR. BUTLIEN: Thanks, Jean.

(SLIDE PRESENTATION CONTINUED)

First I want to just talk briefly about the background information and the results of the remedial investigation at Area B.

Area B is located in the southwestern portion of the FAA Technical Center property. The South Branch of Doughty's Mill Stream is located along the southern portion of the area. Area B is located approximately forty-five hundred feet upstream of the Upper Atlantic City Reservoir. This slide also shows the locations of Area 29 and K, and other areas of concern relative to Area B.

Area B is referred to as the Navy Fire Test Facility. The area was used during the late 1950's and early 1960's for aircraft fire training. A review of historical

aerial photographs indicates that the highest level of activity occurred between 1957 and 1962. During this time frame aircraft and sections of aircraft were located throughout the area and portions of the area's ground exhibited dark-colored stains. By 1965 the area had been grassed over. A portion of the area was later used for GSA motor pool parking. Today a majority of Area B is grass-covered with a heavily wooded area in the souther portion of the site along the stream.

This next slide shows the general layout of Area B. Shown are the approximate limits of the Navy Fire Test Area and then the smaller area showing the GSA Motor Pool parking location. Also note the South Branch of Doughty's Mill Stream along the southern portion of the area and that the and also the location of the former wastewater treatment plant which was closed and demolished in 1992.

This photo was taken in 1988. It shows the southern portion of the site. I'm sorry. This photo was taken in 1987 from the northern portion of Area B looking southwest toward the wastewater treatment facility. Note the dirt road which essentially separates Area B into the northern and southern halves, and also note that the area is generally an open grassy field.

This next photo was taken in 1988 and shows the southern portion of the site. The South Branch of Doughty's

Mill Stream is located immediately behind the front edge of the wooded area. Also note one of the site's monitoring wells which is located adjacent to the stream.

The goal of the environmental investigations at Area B was to determine if past site activities resulted in contamination of the site's soils and ground water. TRC has conducted a number of environmental investigations that are at Area B dating back to 1987. TRC's Phase I investigation at Area B included preliminary investigations such as soil gas surveys and a geophysical investigations. In addition, a total of five surface soil samples, four soil borings, and four subsurface soil samples were collected. In addition, one stream sediment and surface water sample was collected from the South Branch and three monitoring wells were installed at the site.

The next slide shows locations of all the Phase I sampling locations including surface soil samples, soil borings and the one sediment/surface water sampling.

During 1988, TRC conducted a Phase II investigation of Area B. The purpose of this investigation was to further define the lateral extent and chemical nature of a floating product layer which had been identified in monitoring well B-MW3S following the Phase I investigation. These goals were accomplished by drilling a total of twelve soil borings within seventy-five feet of the well. Organic vapor

headspace readings were measured in the soil samples collected from each soil boring. Elevated readings were plotted to determine the lateral extent of the subsurface contamination associated with the floating product. In addition, a sample of the floating product was collected and was determined to be similar to gasoline. Finally, a sample of ground water beneath the floating product was collected and analyzed and it determined to exhibit elevated levels of VOCS.

This next slide shows the locations of the Phase II soil borings drilled in the vicinity of well MW3S. It also shows the approximate extent of the floating product based on the elevated headspace readings. Also note the direction of shallow ground water flow toward the southeast, which is is toward the South Branch.

During 1989 TRC conducted a supplemental investigation. The purpo se of this investigation was to further define the subsurface soil quality in the area of the floating product. This was accomplished by drilling two soil borings and collecting three subsurface soil samples for chemical analysis. The results of the soil testing did not indicate any exceedance of federal or state soil standards.

This next slide shows the locations of the supplemental investigation soil borings drilled adjacent to well MW3S.

A number of additional investigations were conducted at Area B to determine the source of the contamination and to further delineate the nature and extent of ground water contamination at the site. During August of 1992 a HydroPunch study was conducted and focused on areas of stained soils and aircraft staging areas that were visible in the historical aerial photographs. A total of ten HydroPunch locations were sampled in which shallow ground water was collected. The results of this study did not identify a source of the floating product.

The next investigation occurred in January of 1993 and included the installation of two additional monitoring wells, downgrading of well MW3S to further define the nature and extent of dissolved ground water contamination. These wells were sampled during February and May of 1993 and determined to contain several chlorinated VOCs at levels above federal and state ground water quality standards.

During July of 1993 a Geoprobe investigation was conducted to further define the extent of the floating product as well as the nature and extent of dissolved ground water contamination up gradient and down gradient of well MW3S. A total of twenty-six Geoprobe ground water samples were collected during this investigation. The results of the Geoprobe samples resulted in the installation of four additional monitoring wells, one located up gradient, one side

gradient, and two down gradient of well 3S. In addition, one subsurface soil sample was collected and analyzed from each of the new monitoring well soil borings. The results of this investigation further defined the extent of the floating product and the nature and extent of the dissolved ground water contamination plume.

Lastly, a program of quarterly ground water and surface water monitoring was implemented at Area B starting in February of 1993 and is still ongoing. The purpose of the monitoring was to determine trends in the dissolved ground water contamination, evaluate the South Branch surface water quality adjacent to the site, and to measure the product thickness in well MW3S.

(POSTER BOARD)

I would like to now direct your attention to the poster board -- I'll move it a little closer. This poster board basically shows the colored areas which represent the historical ground scars and stained soils that were indicated from the aerial the historical aerial photographs. Shown on this poster are all the environmental investigations that have been conducted during the Phase I and Phase II supplemental in the HydroPunch investigation. The HydroPunch investigation focused on areas within or down gradient of the stained soil area as represented by these black symbols here, and this generally just gives you kind of

a general overview of the historical site use with -- like I said, of the ground stains and stars, and also shows airplane fuselage locations relative to the various investigation sampling locations.

(SLIDE PRESENTATION CONTINUED)

This next slide shows the locations of the twenty-six Geoprobe ground water samples and the four new monitoring wells associated with the investigation. Also shown is the updated approximation of the lateral extent of the floating product plume in the vicinity of MW3S.

This next slide identifies the locations of the three wells and the three surface water sampling stations sampled during the ongoing quarterly ground water sampling areas.

The results of the various investigations at Area B have identified a zone of contaminated ground water at levels exceeding federal and state ground water quality standards. in addition, a plume of floating product has been identified in the southern portion of the site. The floating product has been identified as being similar to gasoline and as measured in MW3S has ranged in thickness between zero and eight inches. The aerial dimensions of the product plume are approximately sixty feet long by twenty-five feet wide. The major dissolved ground wdter contaminants exceeding the ground water quality standards include aromatic and

chlorinated VOCs. However, no specific contaminant source area or areas have been identified during the various investigations at Area B.

This shows the aerial extent of ground water contamination where the ground water quality standards have been exceeded. As you can see, this area is in the southern portion of the site immediately north of the stream.

I would now like to turn the presentation back over to Jean who will summarize the risks associated with the contamination found at Area B, and also summarize the remedial action objectives associated with the site.

MS. OLIVA: Based on the results of the site investigations at Area B, a human health risk assessment was conducted to evaluate potential risks associated with exposures to the soil and ground water. Again, ground water ingestion was evaluated even though a drinking water well does not exist at Area B. The risk estimated for ground water ingestion was above acceptable limits, indicating a remedial response is appropriate. A quantitative assessment of ecological risks also identified a potential risk to wildlife.

Remedial objectives were developed for a remedial response as listed here. The objectives include preventing exposures to both the floating product and the ground water contamination and minimizing the potential migration of these

contaminants. Based on these objectives a feasibility study was conducted.

The Area B Feasibility Study used the same technology evaluation and alternative development process which was used for the Areas 29 and K Feasibility Study.

The remedial actions developed for Area B include the no action alternative; there are three alternatives in which floating product and ground water -- and ground water would both be extracted with the product treated off-site and the ground water treated on-site using various technologies. As I mentioned for Areas 29 and K, the air stripping alternative, which is the first of these three alternatives, utilizes a technology which transfers ground water contaminants to the vapor phase. The second of the three alternatives uses ultraviolet, or UV, oxidation where contaminants are destroyed by exposing them to ultraviolet light in the presence of oxidizers. The last of the three alternatives includes cross-flow pervaporation, a technology which uses a selective membrane that allows certain organic compounds to pass through the membrane and be separated from the water phase. The last remedial alternative involves in situ treatment in which the floating

product and ground water would be treated without being extracted from the ground. The air sparging/vapor extraction technology uses processes similar to air stripping but applies them below ground to remove the contaminants.

Each of the remedial alternatives underwent a detailed evaluation based on the nine Superfund criteria and, again, public comments will provide the basis for determining compliance with the last criterion community acceptance.

Based on the detailed analysis of the remedial alternatives, no action is the preferred remedy for Area B soils. For ground water at Area B, a preferred remedy and a contingency remedy were selected. The preferred ground water remedy consists of in situ treatment to the ground water using air sparging and vapor extraction.

I wanted to describe the-air sparging treatment system. In air sparging treatment, air is injected beneath the water table using an air sparging well. As the air bubbles move upward to the soil, ground water and any floating product which may be present, they strip away the volatile contaminants. The air with the contaminants is then extracted using a vapor extraction well and, if necessary, is treated before being released. Additional testing needs to be conducted at Area B to ensure that the subsurface

conditions are appropriate for the use of this technology.

In the event that this preferred alternative is not appropriate for use at Area B, then the contingency remedy will be employed. And the contingency remedy consists of floating products and ground water extraction with off-site incineration of the floating product and air stripping of the contaminated ground water.

In an air stripping system the extracted ground water is allowed to flow down over packing material to a stripping tower as air is blown countercurrent to the direction of the water flow. As the air passes over the water it strips away the volatile contaminants and they're released through the top of the air stripper.

Both the preferred ground water remedy and the contingency remedy are protective of human health in the environment because they both treat the floating product and the ground water contaminants. Since the contingency remedy utilizes the same basic treatment processes as the cross-flow -- I'm sorry -- as the air sparging vapor extraction, they offer -- both alternatives offer a similar degree of effectiveness.

And this last slide shows the process that will be used to determine the final remedial actions at Areas 29 and K, and Area B. Through this meeting as well as an ongoing thirty-day public comment period, the FAA is soliciting

public comments on the Proposed Plans. We're right in this area here. Written comments will be accepted through May 10th and verbal comments will be accepted here this afternoon following these presentations. Based on the Proposed Plan and the public comments, a Records of Decision will be prepared for each, Areas 29, K and Area B. The Records of Decision will include Responsiveness Summaries which will address all public comments which will be received during the public comment period. Upon finalization of the Records of Decision, a notice will be printed in the Press and a copy of the Records of Decision will be placed in the Administrative Record which is maintained in the reference section here at the Library.

I will now turn the presentation back to Keith Buch of the FAA Technical Center. Keith.

MR. BUCH: Well, thank you, Jean and Larry. I'd just like to state for the record that all practices that led to the contamination of ground water and soil that we have previously viewed have been eliminated at the FAA Technical Center, and that the FAA is currently in compliance with all federal, state, and local regulations respecting the handling storage and disposal of hazardous waste and materials.

At this point we will end the formal presentation and will open the floor up to interested members of the public that may have questions regarding what they've seen

for the past forty minutes. If you do have a question, please state your name, affiliation, and address for the record. Seeing that.there's no members from the public in the audience and there are no questions, I will now close this public meeting. Thank you for coming and please come to our next meeting.

(Ended at Index #1329 at 2:45 P.M.)

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C E R T I F I C A T 1 0 N

I, CAROL PLATT, agent for GCI TRANSCRIPTION AND RECORDING SERVICES, a Notary Public and State- and Federally-Approved Sound Recording operator and transcriber, do hereby certify that the foregoing is a true and accurate transcript of the TRC Public Meeting taken by electronic sound recording at the time, place, and on the date hereinbefore set forth.

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