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Record of Decision:

ROUTE 940 DRUM DUMP
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POCONO SUMMIT, PA
09/28/1992

Text:
RECORD OF DECISION ROUTE 940 DRUM DUMP SITE

DECLARATION

SITE NAME AND LOCATION

Route 940 Drum Dump Site
Tobyhanna Township
Monroe County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Route 940 Drum Dump Site (the "Site) in Tobyhanna Township, Monroe County, Pennsylvania, developed and chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (CERCLA) 42 U.S.C. SS 9601 et seq. and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is based on the Administrative Record for this Site.

The Commonwealth of Pennsylvania, Department of Environmental Resources agrees with the Environmental Protection Agency's (EPA's), choice of a "No Action" decision for this Site, but has not concurred with the Record of Decision (ROD), as written, because of fundamental differences with the EPAinterpretation of the NCP and CERCLA.

ASSESSMENT OF THE SITE

The determination has been made that no Remedial Action is necessary at this Site. Therefore, the Site now qualifies for inclusion in the "sites awaiting deletion" subcategory of the Construction Completion category of the National Priorities List. As specified in Section VI Summary of Site Risks, there are no site-related risks that warrant a remedial action of any kind.

DESCRIPTION OF THE REMEDY

The selected alternative for the Route 940 Drum Dump Site is No Action with future ground water monitoring. Under this alternative, no Remedial Action will be taken at this Site. The ground water in the vicinity of the Site will be monitored once a year for at least the next five years.

STATUTORY DETERMINATIONS

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. S 9606 that the selected alternative is protective of human health and the environment. No remedial action will be taken, however, ground water quality in the vicinity of the Site will be reviewed within five years in consideration of Section 121(c) of CERCLA, 42 U.S.C. S 9621(c) to ensure that human health and the environment continue to be adequately protected.

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RECORD OF DECISION
ROUTE 940 DRUM DUMP SITE

DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

The Route 940 Drum Dump Site is located in Tobyhanna Township near Pocono Summit, Pennsylvania (Figure 1). Both Tobyhanna Township and Pocono Summit are located in Monroe County. The Site is located approximately 20 miles southeast of the Wilkes Barre-Scranton area.

The Site is a grass-covered open clearing consisting of approximately 2.5 acres located in Tobyhanna Township. The Site is approximately 4000 feet east of the intersection of Routes 314 and 940 in the easternmost section of the township.

Adjacent land is used commercially. A machine shop is located northwest of the Site, and a former automobile transfer facility (currently utilized by Pocono Limousine) is located south of the Site. A laminated cabinet shop is located east of the Site across Township Road 643. A gas station, a restaurant, a law office and other commercial buildings are located nearby along Route 940. The Site is presently zoned as a commercial/light-industrial area. It is possible that the Site's zoning could be changed in the future, and subsequently be zoned as a residential area.

The Site is bordered on all four sides by a pine-oak woodland with few human inhabitants nearby. Based on aerial surveys, approximately 4,000 people within a 3-mile radius of the Site utilize the aquifer beneath the Site as their source of potable water. The Site straddles the ridge which forms the Pocono Plateau. Currently, no one lives on the eastern slope of the plateau in the area between the Site and Indian Run Creek, situated 4000 feet southeast of the Site. The northwestern slope, 1,200 feet northwest of the Site, is more heavily populated with the community of Pocono Summit. The community uses Pocono Summit Lake, situated 3,000 feet northwest of the Site, for recreational activities. Summit Point Subdivision is located approximately 1,000 feet east of the Site.

The Site is fenced on all four sides by a six-foot-high wire fence. The Site is accessed from Township Road 643 by an opening in the woods that is controlled by a locked gate. The land is currently idle with several stockpiles of soil and several open excavations on the surface.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The history of waste disposal at the Site is summarized below:

HISTORY OF WASTE DISPOSAL

LandMark International ("LandMark") purchased a 13-acre tract in 1976 from the J.E.M. Partnership which had owned the property since 1974.

Between 1974 and 1978, approximately 600 drums of unknown contents from an unknown source were stored in a clearing consisting of approximately 2.5 acres. The drums were stored in the southeast corner of the clearing.

In 1978, approximately 2 years after the sale of the Site by the J.E.M. Partnership to LandMark, one of the partners of the J.E.M. Partnership arranged for the removal of the drums from the Site at the request of LandMark.

RESPONSE ACTIONS

In 1985, the U.S. Environmental Protection Agency ("EPA") proposed the Site on the National Priorities List ("NPL") under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") as amended by the Superfund Amendments and Reauthorization Act of 1986. The NPL listing was promulgated in September 1987. From 1983 until it's final listing on the NPL in 1987, several investigations, monitoring events, and interim remedial measures were completed at the Site by the Pennsylvania Department of Environmental Resources ("PADER"), EPA and, subsequently, LandMark.

RESPONSE ACTIONS BY EPA AND PADER

In early 1983, PADER learned that some drums may have been buried on the Site and that the contents of some of the drums previously stored there may have been dumped on the surface of the ground on the Site. PADER, with assistance from EPA initiated an investigation of the Site. The following is a summary of the events which occurred during the PADER investigation.

Soil Trenches and Borings

Representatives of EPA and PADER completed trenching and shallow boring operations in April 1983. The rusted remains of several crushed 55-gallon drums were found in shallow trenches along with a very small number of crushed drums. (Excavated drums were collected in a dumpster and later manifested and removed from the Site to a secure facility by a licensed waste hauler). No intact drums, liquid pools or solid masses of chemical materials were found.

Special Container Investigation

Approximately 125 small containers resembling "lab packs" were found in a packed drum resting on the surface near the south corner of the Site. Laboratory analyses, conducted subsequently, revealed that the containers contained no hazardous materials.

ADDITIONAL RESPONSE ACTIONS TAKEN BY LANDMARK INTERNATIONAL

Following EPA and PADER's response actions at the Site, LandMark hired BCM Consultants in May 1983 to undertake further investigations and actions at the Site. The following summarizes the efforts done by Landmark and their consultant:

Excavation and Post-Excavation Sampling of Pits A, B,and C

Soils, which were previously identified during a soil sampling program conducted by BCM as being contaminated with organic solvents were excavated at three locations: Pits A, B, and C (Figure 2). Each of these areas was excavated until all of the soil found to be contaminated had been removed. A licensed hazardous waste hauling contractor handled the disposal of 300 tons of contaminated soil from the Site. The soils were manifested and disposed of in accordance with PADER and EPA requirements.

Area H - Test Pit and Excavation

In January 1987, excavation began in Area H (Figure 2) where chemical contamination had been detected in May 1985. All material was excavated and stockpiled. The contaminated soil stockpile contained between 4,000 and 4,500 cubic yards. While the final portion of Area H was being excavated, six additional crushed, rusted, drum remnants were encountered. The drums were stored onsite until proper disposal was arranged. The soil that was excavated during the drum removal was added to the soil stockpile.

Soil Shredding Pilot Study and Results

On April 20, 1987, a pilot soil shredding operation was conducted at the Route 940 Site. The purpose of the operation was to quantify the reduction of volatile organic compounds ("VOCs") that could be expected. The soil shredding operation, done in conjunction with applicable Federal and State air emission laws, was designed to enhance the volatilization of the VOCs within the soils.

Soil samples were taken at random out of the loader bucket before the soil was shredded. After the soil had been shredded and exposed to the air for 24 hours, a set of samples was taken at random from the material that had been run through the shredder twice and spread out. Analysis of the soils showed an average 98-percent reduction in VOCs. Of the five samples taken before the soil had been shredded, three samples had

total purgeable halocarbons and purgeable aromatics ranging from 203 to 559 mg/kg (parts per million). The post-treatment samples had low residual concentrations. The purgeable halocarbons and purgeable aromatics totals ranged from 2.3 mg/kg to 10.6 mg/kg.

RI/FS INVESTIGATION

In 1985, the Site was proposed for inclusion on the National Priorities List ("NPL"), 40 CFR Part 300, and was finalized in July 1987. In November 1987, Landmark entered into a Consent Order with PADER to undertake a Remedial Investigation/Feasibility Study ("RI/FS") for the entire Site. In 1990, the Consent Order ("Order") between Landmark and PADER was suspended by PADER due to non-compliance with the Order by Landmark. PADER returned the Site back to EPA; EPA then initiated a fund-lead RI and also performed a Risk Assessment ("RA") for the Site.

During the course of the RI, EPA undertook a Potentially Responsible Parties ("PRP") investigation to determine those parties which would be responsible under CERCLA for undertaking the Remedial Design/Remedial Action ("RD/RA"). This investigation included reviewing documents in EPA, State and local governmental agency files, sending and reviewing CERCLA S 104(e) information request letters, reviewing title search documents and researching corporate history and status. As of the issuance date of this ROD, EPA has identified several parties whom it believes to be PRPs for the Route 940 Drum Dump Site.

III. COMMUNITY RELATIONS SUMMARY

In accordance with Sections 113 and 117 of CERCLA, 42 U.S.C. SS 9613 (k)(2)(B) (i-v) and 9617, EPA, in conjunction with PADER, issued a Proposed Plan to present the preferred remedial alternative. The Proposed Plan and draft RI and draft RA reports were made available to the public by maintaining copies in the administrative record. The Administrative Record is kept at the two locations listed below:

Public Reading Room
EPA Region III
841 Chestnut Street
Philadelphia, PA

and

Tobyhanna Township Municipal Building
State Avenue
Pocono Pines, Pennsylvania

No FS Report was undertaken for the Site based on the findings of the RI and RA. An announcement of the public meeting, the comment period, and the availability of the RI/RA was published in the Pocono Record, on August 10, 1992.

EPA held a public comment period from August 10, 1992 to September 9, 1992. A public meeting was held on August 20, 1992 to present information, accept oral and written comments and answer questions from the public regarding the Site and potential remedial alternatives. A transcript of the meeting was maintained in accordance with Section 117(a)(2) of CERCLA, 42 U.S.C. S 9617(a)(2). Responses to both the oral and written comments received during the public comment period are included in the attached Responsiveness Summary. This decision document presents the selected remedial action for the Route 940 Drum Dump Site chosen in accordance with CERCLA, and to the extent practicable, the NCP.

All documents considered or relied upon in reaching the remedy selection decisions contained in this Record of Decision are included in the Administrative Record for the Site and can be reviewed at the information repositories.

IV. SCOPE AND ROLE OF THIS RESPONSE ACTION

EPA's goal for the RI/FS was to determine the nature and extent of contamination, to identify risks posed by the Site; and to develop remedial alternatives to address those risks. There were no principal threats identified at this Site. Principal threats are those source materials considered to be highly toxic or mobile, generally cannot be contained, or would present a significant risk to human health or the environment should exposure occur. This Site was not divided into any operable units, therefore this ROD is the final ROD for the Site.

V. SUMMARY OF SITE CHARACTERISTICS

A. Surface Water Hydrology

Surface water bodies in the vicinity of the Site include Indian Run Creek and Swiftwater Creek. Both streams are located a significant distance from the Site and therefore, it is not expected that they would be adversely affected by any contaminants which may potentially migrate from the Site. No other surface water bodies are known to exist within the potential influence of surface water runoff from the Site.

Onsite Surface Water Drainage

The Site is located on the southeastern flank of a broad northeast southwest trending ridge. The Site is approximately 1500 feet south of the ridgeline and is 10 feet lower in elevation. The ridge forms a surface water divide. The land to the north of the ridge slopes gently to the northwest, while land to the south of the ridge slopes gently at first and then steeply toward the southeast. Surface water north of the ridge flows westward to the Lehigh river. The surface water south of the ridge flows eastward into Indian Run Creek and Swiftwater Creek and ultimately into the Delaware River.

B. Geological Setting

The project Site is situated near the Pocono Plateau escarpment that separates the Pocono Plateau and Glaciated Low Plateau sections of the Appalachian Plateau's Physiographic Province. The Pocono Plateau escarpment represents the westward and northwestward limit of erosion by the Delaware River drainage and is upheld by rocks significantly more resistant to erosion than underlying rocks exposed east of the escarpment. Although somewhat ill-defined in the Site vicinity, the Pocono escarpment is expressed locally by steep slopes and low, near cliff faces that occur immediately south and southeast of the Site.

C. Hydrogeology

The groundwater in the vicinity of the level portion of the Site is found at a depth of 20 to 30 feet below ground surface. The groundwater in this area generally occurs in the fractured bedrock below the base of the glacial till. However, water levels may rise above the glacial till/bedrock contact during seasonally high water level conditions or in areas where the glacial till is sufficiently thick to intercept the water table surface. The Site is not located within the floodplain of any nearby river. Localized areas of perched groundwater, may also exist within the glacial till where lenses of lower permeability material impede the downward flow of water. Based on observations during the RI, the groundwater flow direction in the Site vicinity is toward the southeast.
Immediately southeast of the Site, where a drop-off in surface topography occurs at the contact between the Polar Gap and Packerton Sandstones, the depth to groundwater increases to 65 to 75 feet below ground surface. Five hundred feet further southeast of the Site in the vicinity of the former Conrail automobile transfer facility, the depth to groundwater is generally 40 feet below the ground surface. No groundwater was encountered in the glacial till in these areas.

Within the Site vicinity, ground water is used as a source of potable water for private residences and municipal supply purposes. The majority of private wells located within the Site area are located hydraulically upgradient or cross-gradient. Only three wells were identified as being dowgradient from the Site.

Because it is currently being used as a source of drinking water for local residents, the bedrock aquifer system exhibits the characteristics of a Class II-A aquifer according to the EPA Groundwater Protection Strategy (USEPA, 1986).

D. NATURE AND EXTENT OF CONTAMINATION

Site Characterization

The nature and extent of chemical contamination at the Route 940 Drum Dump Site was characterized through extensive sampling of surface and subsurface soils, ground water monitoring wells, and surface water. In addition, sample data from residential wells were also reviewed. Samples taken initially were analyzed for U.S. EPA Target Compound List (TCL) and Target Analyte List (TAL) constituents. For the organic analyses, this also included searches for nontarget compounds. In later sampling rounds, the list of constituents tested for were reduced to those which were previously detected or were suspected to be present. The data, with required sampling and analysis procedures, underwent a rigorous quality assurance review to ensure compliance, validity, and usability of the results.

All analytical data obtained in the course of the RI was compiled, sorted by environmental medium, evaluated with respect to analytical qualifiers (including sample specific minimum quantification limits), analyzed statistically to generate upper 95 percent confidence limits of the average concentration of each chemical in each medium; and examined in comparison to naturally occurring background levels in accordance with U.S. EPA guidelines. Environmental media evaluated individually include surface water, surficial and subsurface soils, and ground water. The following summarizes the results of the investigation and lists the various chemicals

of concern which were identified during the investigation of the various media.

Surficial Soil Contamination

- A total of 22 surficial soil borings were taken from various locations both on and off the Site to characterize the Site surface soil contamination and to determine the background levels for naturally occurring compounds in the Site surface soils. The boring locations were based on: a review of a soil gas survey which was conducted prior to the soils investigation; review of historical evidence of previous waste disposal; information from previous excavations of contaminated soils; and from locations which were not considered influenced by any of the previous factors and would serve as background sampling points. Figure 3 shows the location of the sample points for the soil samples. Samples were taken from the upper 2 feet of the soils. All of the samples were analyzed for complete Target Compound List ("TCL") Volatile Organic Analysis ("VOA"). Sixteen of the samples were analyzed for the complete Target Analyte List ("TAL") including metals, pesticides, PCBs and cyanides.

- Surface soil contaminants and their maximum concentrations which were detected at the Site and are considered contaminants of concern are: Chloroform, 4 parts per billion ("ppb"); Toluene, 4 ppb; Phenol, 54 ppb; 4-methylphenol, 45 ppb; Pentachlorophenol, 160 ppb; Endrin aldehyde; 0.28 ppb; Alpha-BHC, 0.24 ppb; Endrin, 1.7 ppb; Heptachlor, 0.53 ppb; Heptachlor epoxide, 0.24 ppb; Endosulfan, 0.8 ppb; Dieldrin, 0.51 ppb; DDE, 2.0 ppb; Endosulfan sulfate 0.59 ppb; DDT, 1 ppb; Methoxychlor, 3.4 ppb; Endrin ketone, 0.38 ppb; and Alpha-chlordane, 0.31 ppb. Inorganic contaminants of concern detected in the shallow soils include: Arsenic 8.7 ppb; and Beryllium 0.59 ppb.

A summary of contaminants detected in the surficial soil samples and their range of concentrations is shown in Table 1.

Subsurface Soil Contamination

- A total of 22 subsurface soil borings were taken from various locations both on and off the Site to characterize any contamination which may exist below the surface area which could: (1) serve as a contaminant source; (2) migrate into the groundwater; or (3) be exposed during any type of Site excavation. Sample locations were selected on the same criteria as listed above for the surface soil sampling points. A total of 47 samples taken from various depths ranging from 4 to 25 feet below the Site surface were taken for analysis. All 47 samples taken were analyzed for TCL VOCs with 30 of the samples analyzed for the complete TAL including metals, pesticides, PCBs and cyanides.

- Subsurface soil contaminants and their maximum concentrations which were detected at the Site and are considered contaminants of concern are: Chloroform, 3 ppb; Toluene, 2 ppb; 4-methylphenol, 58 ppb; Pentachlorophenol, 290 ppb; Endrin aldehyde, 0.93 ppb; Beta-BHC, 0.71 ppb; Endrin; 0.19 ppb; Heptachlor, 0.33 ppb; Endosulfan I, 0.69 ppb; DDE, 0.75 ppb; DDT, 2.1 ppb; Methoxychlor, 29 ppb; Carbon disulfate, 2.0 ppb; Total Xylenes, 2 ppb; Gamma-BHC, 2.6 ppb; and Gamma-chlordane, 0.28 ppb. Inorganic contaminants of concern detected in the subsurface soils include: Arsenic 8.9 ppb; and Beryllium 0.75 ppb.

A summary of contaminants detected in the subsurface soil samples and their range of concentrations is shown in Table 2.

Pit Surface Water and Soil Contamination

Both soil and water samples were taken from the three pits: B, C, and H. The results of that sampling is discussed in the following:

- A total of five surface water samples were taken from the three pits

combined. One from pit C and two each from pits B and H. The surface water samples were analyzed for the complete TAL/TCL.

- The laboratory analysis of the five surface water samples found that there were no VOCs present at any of the detection limits. One pesticide, Delta-BHC was found at a level of 0.12 ppb in one sample. All inorganics, that were detected exist at levels which would be considered to be within naturally occurring background levels.

- A total of 21 soil samples were taken from the three pits. Seven of the 21 samples were analyzed for full TCL/TAL and the other 14 were analyzed for TCL (VOA).

- The laboratory analysis of the 21 soils samples found that there were low level volatile compounds contained in the samples taken from the pits. The following compounds were found in the samples taken with their maximum concentration listed: 1,2-Dichloroethane, 4 ppb; 2-Butanone, 31 ppb; 1,1,1-Trichloroethane, 5 ppb; Toluene, 4 ppb; Total Xylenes, 83 ppb; Phenol, 190 ppb; 2,4,5Trichlorophenol, 370 ppb; Bis(2-ethylhexyl)phthalate, 410 ppb. None of thecompounds detected at their respective quantities exceeded any regulatory levels for soils or sediment. Some of the inorganics which were detected were found at levels which exceed what could be considered naturally occurring background levels. Those were; Calcium, 1,260 ppm; Copper, 50,300 ppm; Iron, 39,000 ppm; Magnesium, 1,730 ppm; and Potassium, 1,560 ppm.

A summary of contaminants detected in the surface water and soils from the pits and their range of concentrations is shown in Tables 3 and 4.

Ground Water Contamination

- The deep and shallow monitoring wells at the Site shown on Figure 4 were sampled on three different occasions during the RI. The first sampling event occurred during a preliminary hazardous substance inventory ("HSI") which was done in order to identify contaminants of concern prior to installation of additional wells and a full round of sampling. This round was completed in December 1990. Three existing wells MW-1, MW-4, and MW-5 were selected as sampling wells since they had historically exhibited the highest concentration of volatile contaminants. The three samples were all submitted for full TCL/TAL analysis including total and dissolved metals, pesticides, PCBs, and cyanides.

- A review of the results from the HSI sampling indicated that there were no VOC's present above a level of concern, however,due to detection of Vinyl Chloride during a soil gas investigation a second round of sampling was done using Method 524 to analyze the samples. Method 524 has a lower detection limit for vinyl chloride than Method 601/602, which was used during the initial sampling round. MW-1, MW-3, MW-4, and MW-11 were sampled during this second round. These samples were taken from March 27, 1991 to April 2, 1991.

- A final and comprehensive round of groundwater sampling of both existing and new wells took place between April 29, 1992 and May 7, 1992. A total of 25 samples were taken from the shallow and deep monitoring wells. The samples were analyzed for the full TAL/TCL including total and dissolved metals, pesticides, PCBs, and cyanide.

The analysis of the monitoring well samples was broken down into two groupings so as to examine the shallow bedrock aquifer and the intermediate/deep aquifer. The laboratory analysis results of the deeper aquifer will be discussed in the next section. A total of 18 samples including duplicates were taken from the shallow bedrock wells, numbers MW-1, MW-2, MW-3, MW-4, MW-5, MW-8A, MW-10A, MW-12A, MW-14A, MW-15A, and MW-16A, and were analyzed for the complete TCL with 14 of the 18 samples being analyzed for total and dissolved metals, pesticides, PCB's and cyanide. The results of the TCL analysis detected 1,1,1-Trichloroethane in 5 of the 18 samples in concentrations ranging from 0.5 - 2.0 ppb, 1,1-Dichloroethane in 1 sample at a concentration of 0.6 ppb, Cis-1,2-dichloroethene in 2 samples at a concentration ranging from 0.5 - 2.0 ppb, Trichloroethene in 10 samples ranging in concentration of 0.3 - 4.0 ppb, Total Xylenes in 1 sample at aconcentration of 1.0 ppb and Dimethylphthalate in 2 samples ranging in

concentration from 5.0 - 32 ppb. For total metals, (samples which are unfiltered prior to analysis) some of the samples had concentrations which exceeded levels which would normally be considered maximum background levels. Those metals with the maximum concentration found in any one sample were: Aluminum, 64,000 ppb; Arsenic, 9.0 ppb; Barium, 531 ppb; Cadmium, 8.1 ppb; Chromium, 97.5 ppb; Cobalt, 159 ppb; Copper, 449 ppb; Iron, 122,000 ppb; Lead, 366 ppb; Manganese, 24,000 ppb; and Nickel, 150 ppb. For dissolved metals, (samples that are filtered prior to analysis) Manganese at 12,100 ppb was found at a level higher than would be expected for background conditions.

- A total of 7 samples including duplicates from the deep bedrock wells, numbers MW-6, MW-7, MW-9, MW-11, MW-13, MW-16B, and MW16C, were analyzed for the complete TCL with 6 samples being analyzed for the complete TAL including total and dissolved metals, pesticides, PCBs and cyanides. The Volatile 1,1,1-Trichloroethane was found in all samples with concentrations ranging from 0.65 - 1.0 ppb. Also found were Cis-1,2-dichloroethene in 5 samples in concentrations ranging from 0.7 -2.0 ppb, Trichloroethene in six samples ranging from 0.6 - 4 ppb, and Toluene in 1 sample at a concentration of 0.6 ppb. For total metals, (samples which are unfiltered prior to analysis) some of the samples had concentrations which exceeded levels which would normally be considered maximum background levels. Those metals with the maximum concentration found in any one sample were: Aluminum, 1,690 ppb; Arsenic, 15.0 ppb; Cadmium, 2.4 ppb; Chromium, 12.1 ppb; Iron, 82,200 ppb; Lead, 21.7 ppb; Manganese, 1,200 ppb; and Nickel, 150 ppb. For dissolved metals, (samples that are filtered prior to analysis), there were no samples which exceeded any level whichwould be considered above a background level.

- A total of 10 residential wells were sampled as part of the RI. The wells selected were wells which had previously been sampled by BCM in 1987 in addition to three additional wells of citizens who reside near the Site and had requested that sampling be done. The wells selected were located upgradient cross-gradient and downgradient of the Site. The residential well locations closest to the Site are shown on Figure 5. A total of 11 samples were taken from the wells. Both total and dissolved metal analyses were done on all samples in addition to full TCL VOC analysis.

- The analysis of the residential wells found that in 7 of the samples 1,1,1 Trichloroethane was present in a range of 0.8 - 3.0 ppb. This amount is well below the established Maximum Contaminant Limit of 200 ppb as established by the Safe Drinking Water Act, 42 U.S.C. SS 300f-300j. The analysis also found that several of the residential wells have total metals exceeding what would normally be considered background levels. Those metals with their maximum concentration are: Copper, 459 ppb; and Manganese, 1110 ppb. Neither of these metals has any applicable health-based levels which apply. For dissolved metals, the same two metals Copper, 488 ppb, and Manganese 1,240 exceeded the expected maximum background levels. It should be noted that Thallium, another metal, was found in wells upgradient and downgradient of the Site at 1.0 ppb in both the total and dissolved phases analysis and while there is no background level reported for Thallium for this region, there is a proposed Federal Maximum Contaminant Limit ("MCL" of 2 ppb for Thallium under the Safe Drinking Water Act.

A summary of contaminants detected and their range of concentrations found in the ground water samples is shown in Tables 5 - 7. Figure 3 shows the levels of inorganic chemicals found in the various shallow monitoring wells. Figure 4 shows the levels of inorganic chemicals in the deep monitoring wells. Figure 5 shows the levels of inorganic chemicals found in the residential wells.

Contamination Migration Paths

Based on the information developed during the RI, it can be stated that the previously known Site contaminants have been reduced to levels which do not pose any significant adverse health effects. Therefore, while the ground water would be a potential pathway for contamination migration, the level of residual contaminants remaining within the soils and ground water media are not considered significant enough that their migration would pose a threat to human health or the environment.

Estimated Contaminant Quantity

Based on an analysis of historical photographs of the Site, it was estimated that approximately 600 drums of unknown origin and content at one time occupied the Site. As the majority of these drums were removed prior to EPA and PADER involvement at the Site, their contents and total volume was never determined. The remaining crushed drums that were found later on the Site by EPA and PADER did not provide any information as to their contents. Based on the analysis of the contaminants which were found in the soils and ground water, it can only be surmised that the drums housed some type of materials containing various VOCs. The amount of contaminated soil caused by the leaking and crushed drums cannot be determined with certainty because a majority of the soil estimated at 300 tons was removed prior to the RI/RA. The onsite shredded soil piles, consisting of approximately 4,000 cubic yards, were likely contaminated with the same chemicals as the soils removed from the Site. Based on the results of the RI, the remaining soils on the Site are not contaminated to any significant level.

VI. SUMMARY OF SITE RISKS

A. Human Health Effects of Site Contamination

As part of the RI performed for the Route 940 Drum Dump Site, an RA was conducted to evaluate the potential impacts of the Site on human health and the environment. In the RA, a set of chemicals of potential concern were selected for detailed evaluation based on the RI sampling results. Contaminants of concern were selected separately for three environmental media; ground water, surface water, and soil.

The RA then evaluated the potential human health risks associated with exposure to these chemicals of concern for each media.

Exposure Analysis

Exposure pathways considered for the purpose of evaluating Site risks include: (1) incidental ingestion and dermal absorption from direct contact with contaminated surface soils; and (2) future consumption of contaminated ground water which may be utilized as a potable supply. Other potential pathways of exposure such as inhalation of organics during showering or washing were found to have very low levels of contaminants which would not pose a threat to human health at any time period.

The next step in the exposure analysis process involved quantification of the magnitude, frequency and duration of exposure for the populations, and exposure pathways selected for evaluation. Generally, exposure point concentrations of chemicals of concern were based upon the 95 percent upper confidence limit of the average, so as to produce an estimate of reasonable maximum exposure (RME). Intake factors (e.g., amount of soil ingestion, rate of dermal contact, exposure frequency, and duration) were selected in accordance with EPA risk assessment guidance so that the combination of all variables conservatively results in the maximum exposure that can be reasonably expected to occur at the Site.

Toxicity and Risk Characterization

Projected intakes for each risk scenario and each chemical were then compared to acceptable intake levels for carcinogenic and non-carcinogenic effects. With respect to projected intake levels for non-carcinogenic compounds, a comparison was made to risk reference doses (RfDs). RfDs have been developed by EPA for chronic (e.g. lifetime) and/or subchronic (less than lifetime) exposure to chemicals based on an estimate that is likely to be without an appreciable risk of deleterious effects. The chronic RfD for a chemical is an estimate of an acceptable lifetime daily exposure level for the human population, including sensitive subpopulations, without an appreciable risk of deleterious effects. The potential for non-cancer health effects is evaluated by comparing an exposure level over a specified time period with the RfD derived by the EPA for a similar exposure period. This ratio of exposure is called the hazard quotient.

The non-cancer hazard quotient assumes that there is a threshold level of exposure (i.e. RfD) below which it is unlikely for even the most sensitive populations to experience adverse health effects. If the exposure level exceeds the threshold, (i.e., the hazard quotient exceeds a value greater than 1.0) there may be concern for potential non-cancer health effects. The more the value of the hazard quotient exceeds one, the greater the level of concern for potential health impacts.

To assess the overall potential for non-cancer effects posed by multiple chemicals, a Hazard Index (HI) is derived by summing the individual hazard quotients. This approach assumes additivity of critical effects of multiple chemicals. This is appropriate for compounds that induce the same effect by the same mechanism of action. EPA considers any HI exceeding one to be an unacceptable risk to human health.

For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential human carcinogen. The EPA's Carcinogen Assessment Group has

developed carcinogen potency factors (CPFs) for suspected and known human carcinogens which are used to convert daily intake averaged over a lifetime of exposure directly to incremental risk. The CPF is generally expressed in units of risk per milligram chemical per kilogram body weight per day of exposure (i.e., risk units per mg/kg/day). The CPF or slope factor is the upper 95th percentile confidence limit of the extrapolation (slope) from high-dosed animal data to very much lower doses in humans. The use of the upper limit produces a risk estimate that has a 95 percent probability of exceeding the actual risk, which may actually be zero. For exposure to multiple carcinogens, the upper limits of cancer risk are summed to derive a total cancer risk. Cancer risks beyond the generally acceptable risk range of 1 X 10E-4 to 1 X 10E-6 (i.e. a 1.0 X 10E-6 level indicates one additional chance in 1,000,000 that an individual will develop cancer) are considered an unacceptable risk to human health.

In the baseline RA, the following exposure scenarios were considered; ingestion of chemicals in drinking water; dermal contact with chemicals in water during bathing; inhalation of volatile chemicals while showering or bathing; and ingestion of, or dermal contact with chemicals in soil.

Contaminants of concern for residential well water include the following metals: barium; cobalt; copper; manganese; thallium; and zinc. The only organic contaminant of concern identified for the residential well water was 1,1,1-trichloroethane. Contaminants of concern in the monitoring well water include the same metals as in the residential well water and the following organics: 1,1,1-trichloroethane; cis-1,2,-dichloroethene; trichloroethene; toluene; and total xylenes.

Contaminants of concern for the onsite soils at the Site include the metals: aluminum; arsenic; barium; beryllium; cadmium; chromium; cobalt; copper; manganese; selenium; vanadium; and zinc. The following organics and pesticides are contaminants of concern for onsite soils: chloroform; pentachlorophenol; toluene; 4-methylphenol; endrin; endrin aldehyde; endosulfan I; endosulfan sulfate; dieldrin; alpha-BHC; beta-BHC; gamma BHC; heptachlor; heptachlor epoxide; dieldrin; DDE; DDT; gamma chlordane; and alpha chlordane.

The following summarizes the risk evaluation for the various exposure pathways that were done. It was determined that ingestion, inhalation, and dermal contact with groundwater, and ingestion and dermal contact with Site soils are the only pathways where significant exposure could occur. These tables show, for the groundwater and soils media, population targeted, and the chemicals of concern (chemicals which posed an increased cancer risk of 10E-6 or greater or an individual hazard index greater than 1), their RME which is the upper 95th percentile confidence interval (CI) of their average concentration, the base risk posed by the chemicals of concern, a clean-up level (based on a health-based standard) and the residual risk level remaining after attaining that clean-up level.

It was found during the RA that the HI exceeded 1.0 for several exposure scenarios. The majority of these occurrences were for ingestion of groundwater either from a Site monitoring well or residential wells. The reason for the HI exceeding 1.0 in all of the exposure scenarios was caused by the naturally occurring elements: copper, manganese and thallium which were found in the groundwater from wells located on the Site, upgradient, crossgradient and downgradient from the Site. Even wells which were located a minimum of one-half mile upgradient from the Site show the same levels of these compounds existing in the groundwater. The review of the available data indicates that the background levels for these compounds are normal for this geographical region.

In calculating the risks at the Site, the exposures evaluated assume more extensive contact with the Site contaminants than is currently occurring, or is likely to occur in the future, and as such are conservative.

The following tables, numbers 8 - 11, summarize the various risk scenarios and the total risk number associated with each exposure scenario. Based on the baseline risk assessment, there is no exposure scenario which would pose an increased cancer risk above a 1 X 10E-4 risk factor. (This is the level of increased cancer risk which EPA considers to be unacceptable and would therefore warrant some type of remediation to lower or eliminate the risk posed). The total increased risk for cancer for an adult exposed to surface soils and groundwater from the monitoring wells is 1.18 X 10E-5, which is an acceptable risk level. For children the same exposure scenario poses a risk of 1.69 X 10E-5. The total lifetime exposure cancer risk is 2.44 X 10E-5. For non-carcinogenic risks, there are no health hazard indices above1.0 for any exposure scenarios involving Site soils. For groundwater however, the health hazard index exceeds 1.0 for incidental ingestion from several of the onsite monitoring wells and all of the residential wells that were sampled. The health hazard index for use of groundwater from the monitoring wells selected in the RA ranged from 4.18 for adults to 19.5 for children. For the residential wells, the health hazard indices ranged from 1.15 to 4.46 for children dependent upon which well was utilized as a source. Based upon review of the sampling data forall wells during the RI, it was found that the concentrations all the natural occurrence of the metals: manganese, copper, and thallium are the basis for the health hazard indices exceeding 1.0. These compounds were found in wells that were located upgradient, crossgradient and downgradient. In addition these compounds have been previously found at similar background levels at other Superfund Sites within the same geographical region. Tobyhanna Army Depot, for example, is a nearby Superfund site which has high levels

of these same inorganic compounds in onsite monitoring wells. It was therefore concluded that these metals are occurring on a regional basis and are not Site related contaminants.

TABLE 8
Risk Summary Tables
TOTAL RISKS AT THE ROUTE 940 DRUM DUMP SITE
FUTURE USE SCENARIO
NONCARCINOGENIC RISK

	ADULTS	CHILDREN	LIFETIME SEGMENT
INORGANIC SOILS TOTAL	7.02E-02	5.63E-01	6.19E01
ORGANIC SOILS TOTAL	3.59E-03	2.87E-02	3.16E02
SURFACE SOILS TOTAL	7.38E-02	5.92E-01	6.51E01
MW INORGANIC TOTAL	4.17E+00	1.95E+01	N/A
MW ORGANIC TOTAL	1.15E-02	2.57E-02	N/A
MONITORING WELLS	4.18E+00	1.95E+01	N/A
TOTAL	4.26E+00	2.01E+01	6.51E01

CURRENT USE SCENARIO
NONCARCINOGENIC RISK

	ADULTS	CHILDREN	LIFETIME SEGMENT
INORGANIC SOILS TOTAL	2.40E-03	1.93E-02	2.12E02
ORGANIC SOILS TOTAL	1.23E-04	9.84E-04	1.08E03
SURFACE SOILS TOTAL	2.52E-03	2.03E-02	2.23E02
MW INORGANIC TOTAL	4.17E+00	1.95E+01	N/A
MW ORGANIC TOTAL	1.15E-02	2.57E-02	N/A
MONITORING WELLS	4.18E+00	1.95E+01	N/A
TOTAL	4.18E+00	1.95E+01	2.23E02

FUTURE USE SCENARIO
CARCINOGENIC RISK

	ADULTS	CHILDREN	LIFETIME SEGMENT
INORGANIC SOILS TOTAL	9.75E-06	1.57E-05	2.35E05
ORGANIC SOILS TOTAL	374E-07	5.97E-07	8.97E07
SURFACE SOILS TOTAL	1.01E-05	1.63E-05	2.44E05
MW INORGANIC TOTAL	1.66E-06	6.52E-07	N/A
MW ORGANIC TOTAL	N/A	N/A	N/A
MONITORING WELLS	1.66E-06	6.52E-07	N/A
TOTAL	1.18E-05	1.69E-05	2.44E05

CURRENT USE SCENARIO
CARCINOGENIC RISK

	ADULTS	CHILDREN	LIFETIME SEGMENT
INORGANIC SOILS TOTAL	3.35E-07	5.35E-07	8.03E07
ORGANIC SOILS TOTAL	1.28E-08	2.05E-08	3.07E08
SURFACE SOILS TOTAL	3.48E-07	5.56E-07	8.34E07
MW INORGANIC TOTAL	1.66E-06	6.52E-07	N/A
MW ORGANIC TOTAL	N/A	N/A	N/A
MONITORING WELLS	1.66E-06	6.52E-07	N/A
TOTAL	2.01E-06	1.21E-06	8.34E07

TABLE 10

PATHWAY SUMMARY TABLES
MONITORING WELLS

CURRENT AND FUTURE USE SCENARIOS

NONCARCINOGENIC RISK

INCIDENTIAL INGESTION

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	4.17E+00	1.95E+01
ORGANIC CONTAMINANTS	3.76E-03	1.75E-02
TOTAL	4.17E-00	1.95E+01

INHALATION DURING SHOWERING AND BATHING

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	N/A	N/A
ORGANIC CONTAMINANTS	7.74E-03	8.12E-03
TOTAL	7.74E-03	8.12E-03

DERMAL CONTACT DURING BATHING (CHILDREN)

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	N/A	N/A
ORGANIC CONTAMINANTS	N/A	2.56E-05
TOTAL	0.00E+00	2.56E-05

COMBINED NONCARCINOGENIC RISKS FOR MONITORING WELLS

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	4.17E+00	1.95E+01
ORGANIC CONTAMINANTS	1.15E-02	2.56E-02
TOTAL	4.18E+00	1.95E+01

TABLE 11

PATHWAY SUMMARY TABLES

MONITORING WELL CARCINOGENIC RISK SUMMARY TABLE

CURRENT AND FUTURE USE SCENARIOS

INGESTION OF GROUNDWATER

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	N/A	N/A
ORGANIC CONTAMINANTS	4.26E-07	3.98E-07
TOTAL RISK	4.26E-07	3.98E-07

INHALATION OF VOLATILES DURING BATHING AND SHOWERING

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	N/A	N/A
ORGANIC CONTAMINANTS	1.23E-06	2.53E-07
TOTAL RISK	1.23E-06	2.53E-07

DERMAL INTAKE DURING BATHING

	ADULTS	CHILDREN
INORGANIC CONTAMINANTS	N/A	N/A
ORGANIC CONTAMINANTS	N/A	7.28E-10
TOTAL RISK	0.00E+00	7.28E-10
TOTAL CARCINOGENIC RISK	1.66E-06	6.52E-07

It should be noted that while the HI for the ingestion of the groundwater from either the monitoring wells onsite or residential wells offsite does exceed 1.0, the potential health risks posed by the ingestion are based on conservative estimations. EPA's policy is to be protective of human health and the environment and therefore, EPA is very conservative when calculating risk analysis. For example, while the assumed concentration of manganese used in the RA to determine the HI could cause potential adverse health effects, the potential receptors near the Site would most likely not consume any water with such concentrations of manganese as used in the risk calculation; this level of manganese would discolor the water and cause a distasteful flavor. Therefore while the HI for the various wells sampled exceeds 1.0, due to the conservative nature of EPA's assumptions which were used in doing the RA, the potential for adverse health risks would likely be several magnitudes less than indicated by the HI. A more detailed discussion of the risk analysis conducted for the Site is contained in the RA and is part of the Administrative record.

Upon review of the baseline RA, it has been determined that under the various risk scenarios evaluated for contaminants of concern for the Site, the Site contaminants do not pose any risks or threat to human health or the environment which would warrant EPA undertaking a remedial action. It should be noted that while there are naturally occurring background levels of metals, which at the concentrations detected in the groundwater samples could potentially pose a health threat to those who use it as a drinking water source, EPA can take no action. Pursuant to CERCLA, and particularly the NCP at 40 CFR 300.400(b)(1), EPA is unable to address any risks that are posed by naturally occurring elements within an area except in conjunction with the remediation of Site-related contamination that is not naturally occurring.

B. Environmental Impact of Site Contamination

An ecological assessment of the Site was done in conjunction with the Remedial Investigation. No significant adverse impacts to any environmental receptor were found on or near the Site and based on the results of the RI, it was determined that the remaining levels of contaminants in the soils and groundwater should not pose any type of threat to any environmental receptor. There are no endangered species in the immediate vicinity of the Site.

C. Uncertainty in the Risk Characterization

In order to quantitatively estimate the potential risks to human health which may occur as a result of exposure to contaminants in ground water at the Site, numerous assumptions regarding exposure parameters were required. Within each exposure parameter there is an inherent uncertainty.

VII. DESCRIPTION OF THE "NO ACTION" ALTERNATIVE

The "No Action" Alternative selected for implementation at the Route 940 Drum Dump Site is described in the following:

Under the "No Action Alternative, EPA will not undertake any type of remedial action since there are no Site related risks which would warrant EPA to implement a remedial action. It has been determined through the RI that previous removal actions which were completed by EPA, PADER, and LandMark have sufficiently remediated the Site so that the residual risk posed by the Site is below health-based standards. Therefore the Site does not warrant any further remedial action. However, as there is evidence of low-level concentrations of organic contaminants remaining in the Site soils and monitoring wells, EPA will still review the Site within five years in accordance with CERCLA S 121 (d) to assure that changes have not occurred which would pose a risk to human health or the environment. In order to facilitate this review, a groundwater monitoring program will be implemented to enable EPA to meet this requirement and to ensure Site conditions do not change so as to pose an unacceptable risk.

O&M REQUIREMENTS

Ground Water Monitoring

Ground water monitoring shall be conducted for at least five (5) years. During the first five years, sampling shall be conducted annually. This data will be evaluated by EPA, in consultation with PADER, to determine the monitoring needs for future if needed. Parameters to be monitored include but are not limited to the following: volatile organic compounds, semi-volatile organic compounds, and TAL inorganics (metals). The number of the existing monitoring wells which will be used will be determined by EPA during the O&M workplan development to maximize the monitoring of the ground water migration from the Site.

Documentation of Significant Changes

The alternative originally identified in the Proposed Plan is also the alternative selected in the ROD. There were no significant changes made to the selected alternative in the time period between the issuance of the Proposed Plan on August 10, 1992 and the signing of the ROD approximately eight weeks later.