

EPA Superfund
Record of Decision:

ELIZABETHTOWN LANDFILL
EPA ID: PAD980539712
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ELIZABETHTOWN, PA
10/01/1997

ELIZABETHTOWN LANDFILL
SUPERFUND SITE

LANCASTER COUNTY, PENNSYLVANIA

RECORD OF DECISION

OCTOBER 1997

ELIZABETHTOWN LANDFILL

RECORD OF DECISION

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RECORD OF DECISION
ELIZABETHTOWN LANDFILL SUPERFUND SITE

DECLARATION

SITE NAME AND LOCATION

Elizabethtown Landfill Superfund Site
West Donegal Township
Lancaster County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This Record of Decision ("ROD") presents the selected remedial action plan for the Elizabethtown Landfill Superfund Site ("Site") in Lancaster County Pennsylvania which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), 42 U.S.C. 9601 et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. § 9601 ("SARA"), 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 upon and documented in the contents of the Administrative Record.

The Commonwealth of Pennsylvania has been consulted throughout the investigation of the Elizabethtown Landfill Site and supports EPA's selection of the remedy identified in this ROD.

ASSESSMENT OF THE SITE

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, that actual or threatened releases of hazardous substances from this Site, as specified in Section VII, Summary of Site Risks, in the ROD, if not addressed by implementing the response action selected, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial action plan in this document is presented as the permanent remedy for controlling buried waste, leachate, contaminated ground water and contaminated surface water at the Site. The major components of the selected remedy include the following:

- Capping the uncapped portion of the Landfill (the southern portion of the Landfill) with a cap designed in accordance with, inter alia, the Pennsylvania Municipal Waste Management Regulations, 25 Pa. Code Ch. 273;
- Quarterly monitoring of five residential wells located to the north-northwest of the Landfill, and two public water supply wells belonging to the Masonic Homes (a continuing care retirement community and children's home) located to the northwest of the Landfill. An alternate source of drinking water or treatment shall be provided for any of these wells in which EPA determines that contaminants attributable to the Landfill are found which exceed the action levels set forth in Appendix VI herein;
- Conducting a predesign study of the ground water and surface water to evaluate the effectiveness of the above remedial measures on the attainment of ground water and surface water Cleanup Levels set forth in this ROD, and to furnish data necessary to determine appropriate locations for a ground water extraction well(s); and
- Construction of a ground water extraction well system; extraction and on-Site treatment of contaminated ground water and leachate; and discharge to Conoy Creek in accordance with functional effluent limits set under the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et. seq.; and 25 Pa. Code § 92.31 (implementing requirements of the federal Clean Water Act's National Pollutant Discharge Elimination System ("NPDES") regulations, 40 CFR §§ 122.41 - 122.50). The on-Site treatment plant shall include the following treatment processes:
 1. Precipitation (to remove metals);
 2. Air stripping with air controls (to remove volatile organic compounds); and
 3. Liquid phase carbon adsorption (to remove semi-volatile organic compounds and pesticides);

Provided, however, that if after the Landfill cap is installed the predesign ground water and surface water study described above demonstrates that the ground water and surface water cleanup levels set forth in this ROD can be attained within a reasonable time period, as determined by EPA, without extraction and treatment of ground water, then EPA will modify the ROD to eliminate the requirement for such extraction and treatment in accordance with CERCLA and the NCP.

STATUTORY DETERMINATIONS

Pursuant to duly delegated authority, I hereby determine that the selected remedy is protective of human health and the environment, complies with Federal and State requirements that legally are applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfies the statutory preference for remedial actions in which treatment that reduces toxicity, mobility, or volume is a principle element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five (5) years after the commencement of the remedial action to ensure that human health and the environment continue to be adequately protected by the remedy.

RECORD OF DECISION

ELIZABETHTOWN LANDFILL SITE

PART II - DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

The Elizabethtown Landfill is an inactive landfill that occupies approximately 16 acres at 349 West Ridge Road in West Donegal Township, Lancaster County, roughly one mile southwest of Elizabethtown, Pennsylvania (Figure 1). The Elizabethtown Landfill Site ("Site") includes the Elizabethtown Landfill and all areas adjacent to or affected by the Landfill where hazardous substances from the Landfill have come to be located.

The Landfill is unlined. Between 1986 and 1987 the Landfill's owner installed a layered clay/sand/vegetative soil cover over the northern 12 acres of the Landfill. The southern 4 acres of the Landfill are covered variously with soil and gravel (Figure 2). Surface water flowing over the Landfill is diverted to a sedimentation pond at the northeastern corner of the Landfill. Presently leachate is collected in a toe drain along the northwestern edge of the Landfill and conveyed to a collection sump from which it is collected and transported to Modern Landfill in York County, Pennsylvania for treatment. Landfill gas is collected through a series of extraction wells and flared at a single, on-Site station.

The Landfill property is bounded on the south, southeast, and southwest by private residences located on West Ridge Road and Valerie Drive. Adjoining the Landfill property to the west and northeast are agricultural lands. Private residences located on West Bainbridge Road adjoin the Landfill property to the northwest.

Demographic information from the 1990 census indicates that the population within a one, two, and three-mile radius of the Site is 2,444; 11,234; and 15,442; respectively. The largest population center near the Site is the Borough of Elizabethtown with an estimated 10,000 people. The next largest population center is Rheems, which has an estimated population of 600.

Residents living near the Site obtain their water supplies from several sources. Residential properties adjacent to the Landfill obtain water from private wells. Four homes on West Bainbridge Road (i.e., Street Addresses 820, 840, 1096, and 1098 West Ridge Road) and one home on Rear Maytown Road (i.e., 227 Rear Maytown Road) are currently supplied bottled water by the owner of the Landfill. The Masonic Homes properties, located northwest and north of the Landfill, obtain water from public water supply wells which it owns and operates on its property. Residents living closer to the Borough of Elizabethtown obtain potable water from a municipal supply system. This system obtains water from five wells and a reservoir that are all located between one and two miles north and northeast of the Site. The components of this municipal system are considered to be hydraulically upgradient of the Site.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

For some years prior to 1959 a sandstone quarry was operated at the Site of the Elizabethtown Landfill. It was subsequently operated as an unlicensed Landfill from at least 1959 through 1973, accepting municipal, household, and industrial wastes, in its later years operating under the name of United Disposal, Inc. ("UDI"). UDI ceased landfilling operations on or about July 31, 1973 pursuant to a Consent Decree with the Pennsylvania Department of Environmental Resources ("PADER") (subsequently renamed the Pennsylvania Department of Environmental Protection ("PADEP")). In March 1976, UDI sold its assets, including the Landfill, to SCA Services Inc. of Pennsylvania, Inc. ("SCA"). SCA operated the Site as a trash hauling transfer station; it also parked and maintained trash hauling trucks, and occupied an office building, at the facility. In 1986 and 1987 SCA installed a soil-based cover over approximately 12 acres comprising the northern portion of the Landfill; the approximately 4 acres remaining are covered by a permeable base of gravel. In 1994 Waste Management Disposal Services of Pennsylvania, Inc. ("Waste Management," from which SCA changed its name in 1993), stopped using the facility as a transfer station, and since that time the Site has been inactive.

On March 31, 1989 the EPA promulgated the Site for inclusion on the Superfund National Priorities List ("NPL") due to the presence of Site-related contaminants in the drinking water aquifer which extends underneath the Landfill, and in a stream near the Landfill. In September, 1990 SCA entered into an Administrative Order on Consent with EPA to conduct a

Remedial Investigation/Feasibility Study ("RI/FS") to determine the extent of contamination at the Site, in accordance with EPA guidelines and subject to EPA oversight.

In July of 1994 EPA accepted the Remedial Investigation ("RI") Report for the Site, which was based upon field sampling conducted in 1992 and 1993. EPA issued the Human Health Baseline Risk Assessment for the Site on July 15, 1994 and issued data addenda thereto on July 7, 1995 and September 4, 1997. In July of 1995 EPA accepted Waste Management's Feasibility Study ("FS") Report that set forth and compared several different cleanup alternatives for the Site. On July 26, 1995 EPA issued a Proposed Plan, based in part on the FS Report, which evaluated nine alternatives to remediate contamination at the Site.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Sections 113(k)(2)(B)(I-v) and 117 of CERCLA, 42 U.S.C. §§ 9613(k)(2)(B)(I-v) & 9617, set forth the public participation requirements which must be followed with respect to the CERCLA remedy selection process. In accordance with these provisions of CERCLA, on July 28, 1995 EPA released the Proposed Plan for the Elizabethtown Landfill Site to the public for the required 30 day public comment period. EPA held a public meeting to discuss the Proposed Plan on August 23, 1995 during which representatives from EPA answered questions about the Site and the cleanup alternatives under consideration. In response to public request and in accord with CERCLA, EPA extended the comment period until September 26, 1995. The Masonic Homes and Waste Management each submitted written comments addressing EPA's Proposed Plan within this public comment period.

Following the close of the formal public comment period on September 26, 1995, the Masonic Homes and Waste Management submitted additional comments on the Proposed Plan, (including critiques of the other's submissions), as did West Donegal Township and Congressman George W. Gekas. As detailed below, these commenters addressed a number of issues, including: the adequacy of the RI (particularly with regard to whether the Landfill has caused elevated levels of manganese in the Masonic Homes drinking water supply), and the effect of ground water pumping and treating on the achievement of Site cleanup goals and on existing water supply wells in the area.

On August 21, 1996 Waste Management submitted to EPA an Alternate Remedial Plan ("ARP") which had not been included in its FS. The ARP, endorsed by the Borough of Elizabethtown and the Masonic Homes, included the following components: construction of an asphalt landfill cap over the southern portion of the Landfill (and maintenance but not upgrading of the existing northern area cap); provision of an alternate source of drinking water to residents of Bainbridge Road; and completion of an extensive ground water study to further assess the ground water and the need for its active withdrawal and treatment at the Site. Waste Management subsequently reached a private agreement with the Masonic Homes to provide it a new drinking water well located farther away from the Landfill.

EPA has considered all comments it received during and after the formal public comment period in accordance with CERCLA and the NCP. In part in response to these comments, EPA has conducted additional sampling and analyses of drinking water and ground water wells at and near the Site over the past two years. All such comments have been included in the administrative record on which EPA is basing this remedial action. A copy of the administrative record for the Site has been maintained at the West Donegal Township Building, located at 7 West Ridge Road in Elizabethtown, Pennsylvania, and at the EPA's Region III office, located at 841 Chestnut Building, Philadelphia, Pennsylvania.

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

This Record of Decision addresses all contamination at the Site including the Landfill, and contaminated ground and surface water; and addresses the drinking water sources (water supply wells) affected by, and potentially affected by, contamination at the Site. This ROD is the only planned CERCLA response action for the Site.

V. SUMMARY OF SITE CHARACTERISTICS

Hydrology

The Elizabethtown Landfill Site is located in a broad, shallow valley on the northwest-facing slope of a northeast-southwest trending ridge (Figure 3). The ground surface along the ridge is at an elevation of about 540 feet above mean sea level ("MSL") and slopes northwestward for a distance of about 2,500 feet to Conoy Creek. The water surface elevation in

Conoy Creek is about 390 feet MSL in the vicinity of the Site. The ridge on the southeast side of the Landfill property forms a local watershed drainage divide.

Surface water drainage in the vicinity of the Site is characterized by perennial and intermittent streams flowing to the northwest and discharging to Conoy Creek. Conoy Creek flows past the Site from northeast to southwest and discharges to the Susquehanna River about 4.5 miles from the Site. The Creek passes the Site about 200 feet beyond the northwestern property boundary.

Geology

The Site is located within the Triassic Lowlands section of the Piedmont Physiographic Province. During the Triassic Period, forces within the Earth began to push apart crustal land masses and form early-Atlantic Ocean "rift" basins. Erosion of the adjoining land masses resulted in a large influx of sediments to the basins. These sediments, consisting of clays, silts, sands, and gravels, accumulated to great thicknesses in the expanding and deepening basins. Fracturing and faulting also occurred within the basins allowing igneous intrusions of diabase. Consolidation of the sedimentary deposits and crystallization of the diabase formed the bedrock that currently underlies the Site and region.

The Triassic age bedrock is approximately 200 million years old and is part of the Newark Basin Group. The bedrock sequence at the Site is known as the New Oxford Formation and consists of interbedded strata of sandstones and conglomerates, siltstones, and shales that reach a total thickness of 6,000 feet.

Diabase sills and dikes intruded the New Oxford Formation regionally. One of the diabase dikes forms the ridge, and surficial watershed divide, along the southeastern border of the Site. The diabase is typically a fine to coarse-grained, dark-gray rock composed of gray plagioclase and black or greenish-black pyroxene. Where the diabase intruded through fractures in the sedimentary rocks, the high temperatures associated with the intrusion caused distinctive mineralogic changes to occur along the contact.

The upper zone of the New Oxford Formation consists of weathered bedrock that generally ranges between 20 and 60 feet below ground surface. Overlying the weathered bedrock is a relatively thin veneer of overburden soils consisting of silts, clayey silts and sands. These soils range from 3 to 10 feet in thickness.

Hydrogeology

Ground water in the vicinity of the Site generally follows the topographic relief, flowing from the upland residential area in the southeast to the lower elevations along Conoy Creek. Shallow ground water flows under unconfined conditions in the overburden and weathered bedrock. Deeper ground water flow is more complex due to the interbedded nature of the sandstone and siltstone bedrock strata, and the joints which dissect the strata. Flow in the bedrock zone occurs along the shallow-dipping bedding plane surfaces and through the stratal units along sub-vertical joints.

Ground water flow through the Landfill is characterized by shallow overburden flow and surface water discharge into the tributaries located on the northeast and southwest sides of the Landfill. Ground water also flows from the Landfill into the deeper bedrock flow system.

Permeabilities within the different ground water flow zones vary based on lithology, degree of fracturing, and depth below ground surface. In the overburden soils and weathered bedrock, permeabilities are relatively high. The hydraulic conductivity (k), which is a measurement of the permeability, ranges from 1×10^{-4} cm/sec to 7×10^{-3} cm/sec in this zone. In the deeper bedrock, hydraulic conductivities in the sandstones and conglomerates ($k = 5 \times 10^{-5}$ cm/sec to 5×10^{-3} cm/sec) were found to be more permeable than the siltstones ($k = 4 \times 10^{-6}$ cm/sec to 2×10^{-4} cm/sec).

The hydraulic conductivity of similar lithologic units increased with the degree of fracturing. The permeability of fractured siltstone is one to two orders of magnitude higher than that of unfractured siltstone. Based on limited data, the hydraulic conductivity of the siltstones tended to decrease with depth, while the hydraulic conductivity of the sandstones did not vary with increasing depth.

VI. NATURE AND EXTENT OF CONTAMINATION

Monitoring data collected during the RI was used to characterize the nature and extent of contamination at the Landfill Site. The contamination was characterized through sampling ground water monitoring wells, residential drinking water wells, surface water, sediments, and soils. A recapitulation of the more significant findings of the RI which establish the need for clean-up action follows. More detailed information on the extent of contamination is contained in the RI Report which is included in the Administrative Record for the Site. Also included in the Administrative Record is information EPA gathered after the RI Report was completed, including subsequent drinking water and ground water sampling and analyses.

Ground water

Ground water at the Site is contaminated with hazardous substances attributable to the Landfill. The contamination is located both under the Landfill property and in a plume extending beyond the Landfill property boundary. Figure 4 depicts the generalized location of the contaminant plume. The most prevalent contaminants detected in the ground water are chlorobenzene, benzene, vinyl chloride, 1,1-dichloroethane, bis(2-chloroethyl) ether, arsenic, barium, magnesium, manganese, and thallium.

Some of the contaminants found in the ground water at the Site (beyond the boundary of the Landfill property) exceed EPA's limits for contaminants in public water supplies (i.e. Maximum Contaminant Levels ("MCLs") established under the Federal Safe Drinking Water Act ("SDWA"), 42 U.S.C. §§ 300(f) - 300(j)-26) and/or risk-based and health-based concentrations determined by EPA. Contaminants detected in ground water at the Site in concentrations which exceed Federal MCLs include:

- Benzene
- Chlorobenzene
- 1,1-Dichloroethene
- 1,2-Dibromo-3-Chloropropane
- Methylene chloride
- Tetrachloroethene
- Trichloroethene
- Vinyl Chloride
- Bis(2-Ethylhexyl)phthalate
- Barium
- Lead
- Thallium

Table 1 lists the maximum concentration of these compounds detected at the Site and lists the MCLs.

Surface Water

Some contamination attributable to the Landfill was found in surface water in Conoy Creek and its tributaries that are adjacent to the Landfill. Contaminants found in the surface water in concentrations exceeding regulatory clean-up levels include:

- Cyanide
- Lead
- Tetrachloroethene
- Methylene chloride
- Bis-(2-Ethylhexyl)phthalate
- 2-Chlorophenol
- Aldrin
- 4,4'-DDD
- Endrin

Table 2 lists the maximum concentration of each of these contaminants that was detected in the surface water at the Site and also lists the State regulatory clean-up level of the contaminants.

VII. SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted an analysis to estimate the human health and environmental problems that could result if contamination at the Site is not remediated. This analysis is referred to as the Baseline Risk Assessment. The Risk Assessment assesses the toxicity, or degree of hazard, posed by hazardous substances related to a Site and describes the routes by which humans and the environment could come into contact with these substances. Separate calculations are made for those substances that can cause cancer (carcinogenic) and for

those that can cause non-carcinogenic health effects.

The NCP, EPA's primary guidance for selecting cleanup actions under Superfund, establishes acceptable levels of carcinogenic health risk for Superfund sites ranging from 1 increased cancer case per 10,000 people exposed, to 1 increased cancer case per 1 million people exposed. This translates to a risk range of between one in 10,000 and one in 1 million additional cancer cases. Expressed as scientific notation, this translates to a risk range of between 1×10^{-4} and 1×10^{-6} (also written as $1E-04$ and $1E-06$). The NCP also states that sites should not pose a non-carcinogenic threat. EPA defines a non-carcinogenic threat as a chronic dose exceeding the reference dose (i.e., the dose at which no adverse health effects are expected to be observed), as indicated by a Hazard Index ("HI") greater than 1. The Hazard Index identifies the potential for the most sensitive individuals to be affected adversely by non-carcinogenic chemicals. If the Hazard Index exceeds one (1.0), there may be concern for non-carcinogenic effects.

The health risk analysis results for the Elizabethtown Landfill Site are summarized below and in Table 3. Detailed information on the risk assessment is contained in EPA's Final Risk Assessment Report issued on July 15, 1994 and addenda thereto dated July 7, 1995 and September 4, 1997. These documents are contained in the Site Administrative Record File.

The health risk analysis results indicate that residents now living in the vicinity of the Landfill Site are not currently exposed to contamination from the Landfill that exceeds EPA's acceptable levels for carcinogens or non-carcinogens. The principal human health risks at the Site are due to the potential exposure of future well water users to contaminated ground water. EPA assumes that if the ground water contamination at the Site is not cleaned up, people could potentially use contaminated ground water as a water supply source, and thus could be exposed to unacceptable levels of contamination. The EPA calculates that unacceptable levels of exposure could occur by persons ingesting contaminated ground water, adsorbing contaminated ground water through their skin, and by inhaling vapors from contaminated ground water while showering.

Cancer Risk due to Future Use of Ground Water

EPA calculates that the quantifiable carcinogenic risks for the future use of ground water at the Site are greater than 1×10^{-4} and thus exceed EPA's acceptable levels (See Table 3). Ingestion of ground water and inhalation of vapors contribute almost equally to overall Site risk, with arsenic, benzene, bis(2-chloroethyl)ether, 1,1,-dichloroethene, and vinyl chloride the most significant contaminants.

Non-cancer Risk due to the Future Use of Ground Water

As shown in Table 3, the Hazard Index calculated for the future use of ground water at the Site is greater than 100, and thus significantly exceeds EPA's acceptable level of 1.0. Ingestion of ground water containing high levels of manganese is the main contributor to non-cancer risk.

Ecological Risks

The ecological risk assessment considered the effects of hazardous substances on the ecosystem around the Landfill if the contamination from the Site were not addressed. Results of this assessment indicate that contaminated ground water discharging to Conoy Creek and its tributaries could potentially affect aquatic life. The detected contaminants that pose the greatest concern for ecological risk include endrin, chlorobenzene and arsenic. The Ecological Risk Assessment Report and the RI/FS Reports, which are contained in the Administrative Record, show that the pesticide endrin, (which was detected in surface water at a maximum concentration of 9.3 parts per trillion and in sediment at a maximum concentration of 4.1 parts per billion) may pose a potential effect to ecological receptors in surface water bodies surrounding the Landfill, and to ecological receptors exposed to sediments from those surface water bodies. Also, the contaminants chlorobenzene and arsenic pose a potential threat to ecological receptors exposed to sediments in the surface water bodies surrounding the Landfill. Additional studies including surface water and sediment monitoring for the contaminants endrin, chlorobenzene, and arsenic are required to determine whether hazardous substances released from the Site cause significant adverse effects to aquatic life.

Summary

Actual or threatened releases of hazardous substances from this Site, if not addressed, may present a current or potential threat to public health, welfare, or the environment.

VIII. DESCRIPTION OF ALTERNATIVES

The FS Report evaluated a variety of technologies to identify those capable of addressing the contamination at the Elizabethtown Landfill Site. The technologies determined to be most applicable were developed into remedial alternatives. The remedial alternatives were then carried through a detailed analysis in the FS, as was a "no action" alternative, as required by the NCP.

The site-wide alternatives analyzed in the FS are presented and discussed below. The FS Report and EPA's comments thereon, which are contained in the Administrative Record, should be consulted for more information on these alternatives. Each alternative's number presented herein corresponds to that used in the FS.

All costs and implementation time frames specified below are estimates. These cost estimates are derived from the FS and are expected to have an approximate accuracy of -30 percent to +50 percent. Total costs are reported as net present value (i.e., the current value of money spent on capital costs, and operation and maintenance over a 30 year time period).

Since the time that the FS Report was written, Pennsylvania regulations concerning cleaning up contaminated ground water at Superfund Sites have changed. The Commonwealth's current cleanup standards are less stringent than those in place at the time the FS Report was prepared, and upon which the cost estimates contained in the FS Report were based. The cost estimates for each of the alternatives in the FS were based on the assumption that the Remedial Action would be required to clean up all contaminants of concern in ground water to background levels at the Site, in accordance with Pennsylvania's policy promoting a 'clean up to background' standard for ground water remediations, and CERCLA's requirement that CERCLA remedial actions achieve State cleanup standards to the extent that, inter alia, they are more stringent than federal standards. After the FS was prepared the Commonwealth rescinded this policy and enacted a new statute establishing less stringent cleanup levels for remediations in Pennsylvania, which EPA has considered in accord with CERCLA and the NCP. (A detailed discussion of the cleanup standards for the Elizabethtown Landfill Site is included in Section IX. of this ROD).

As a result of the change in the Commonwealth's cleanup standards for ground water, it is likely that the area of contaminated ground water at the Site which will require remediation may be less extensive than was assumed at the time the FS was prepared. Hence, the cost estimates presented in the FS report could be considered conservative, and the actual cost for cleaning up the contaminated ground water under each of the alternatives could be less than the values presented in FS Report, albeit within the accuracy of the estimates.

Common Elements

The alternatives EPA considered contain many common components, a number of which are currently being implemented, including:

- Provision of an alternative water supply for five down-gradient residences;
- Routine inspection and repair of the security fence;
- Maintenance of existing landfill cover, including annual mowing of vegetation, plus regrading and revegetating of eroded areas;
- Maintenance of storm water management system, including sediment removal from ditches and sedimentation basins, plus erosion repair;
- Operation and maintenance of the Landfill gas management system to actively collect the gas generated in the Landfill, prevent its migration off-site, and burn it at a flare station;
- Landfill gas monitoring around the perimeter of the Landfill to measure gas migration; and
- Operation and maintenance of the leachate collection system which includes drains and seep collectors.

In addition, each alternative, except for Alternative 1 (no further action) contains the following actions not presently being implemented:

- Extraction of contaminated ground water for treatment and disposal;

- Extension of the security fence to surround the entire Landfill;
- Establishment of deed restrictions to protect the Landfill cap, minimize the potential for direct contact with the Landfill's contents, and prohibit use of the water supply well located on the Landfill property for provision of drinking water.
- Ground water and surface water monitoring for organic and inorganic contaminants.
- Sediment monitoring to measure of remedial effectiveness;
- Shallow ground water level monitoring to assess ground water extraction impacts on wetlands hydrology.

Extraction of contaminated ground water for treatment and disposal is a central component of each alternative (except for Alternative 1 - the no action alternative) which EPA considered. Since the aquifer under the Site is a present and a potential source of drinking water, EPA's remediation goal for ground water is to restore it to drinking water quality, in accord with the NCP. 1 Extraction/pumping would permit the cleanup of contaminated ground water at and beyond the boundary of the Landfill property, and would help control site-related discharges to Conoy Creek. Contaminated ground water would be pumped from an extraction well system at the Site. Extracted ground water would be combined with leachate from the Landfill, then treated and disposed of using varying options depending on the alternative.

Each alternative (except for Alternative 1 - the no action alternative) includes a treatment/disposal method for the extracted ground water and collected leachate. Alternative 1 includes continued off-Site treatment and disposal of the leachate at the Modern Landfill located in York County, Pennsylvania. No provisions for extraction, treatment or disposal of ground water is included in Alternative 1. Alternatives 2 and 3 include conveyance of the extracted ground water plus collected leachate off-Site to the Elizabethtown Wastewater Treatment Plant.

Alternatives 4 through 9 include ground water/leachate treatment on-Site at the Elizabethtown Landfill to remove metals and organic compounds, and the discharge of treated water to Conoy Creek. The on-Site treatment System for each of these alternatives would be configured to meet effluent discharge limits set in accordance with functional effluent limits set under the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et seq.; and 25 Pa. Code § 92.31 (implementing requirements of the Federal Clean Water Act's National Pollutant Discharge Elimination System ("NPDES") regulations, 40 CFR §§ 122.41 - 122.50). All of these alternatives employ precipitation for the removal of metals, but differ in their methods for treating organic compounds. Alternatives 4 and 5 include air stripping followed by carbon adsorption to remove volatile organic, semi-volatile organic, and pesticide contaminants. Treatment of organic compounds in Alternatives 6 and 7 is the same as in Alternatives 4 and 5, but adds vapor phase carbon for emissions control of volatile organics removed by the air

1 See 40 C.F.R. § 300.430 (a)(iii)(F).

stripper. Alternatives 8 and 9 use UV oxidation to remove organic compounds (including pesticides) from the ground water and leachate stream.

Alternatives 2 through 9 include placing final cover on the southern area of the Landfill to meet current PADEP closure requirements for municipal landfills, 25 Pa. Code Ch. 273.234. Alternatives 2, 4, 6, and 8 leave the existing northern area Landfill cover intact. 2 Alternatives 3, 5, 7, and 9 include upgrading the existing cover on the northern area of the landfill to meet the current PADEP municipal landfill closure requirements applicable to new cap construction, 25 Pa. Code Ch. 273.234.

Alternative 1: No Further Action

Capital Cost:	\$0
Annual Operation and Maintenance	
O&M Cost years 1-30:	\$0.4 million
Present Worth Cost:	\$6.9 million
Implementation Time	
Construction Complete:	0 years
Remedial Objectives Achieved:	indefinitely long

The NCP requires that EPA consider a "no action" alternative for every site to establish a

baseline for comparison to other alternatives. In this alternative, no further action would be taken at the site, although existing maintenance and monitoring programs would continue. The leachate and landfill gas collection systems would continue to be operated and 5 downgradient households would continue to receive an alternate water supply.

Alternative 2: Install Southern Area Cover, Extract Ground Water, Discharge to POTW

Capital Cost:	\$ 4.5 million
Annual O&M Cost years 1-30:	\$ 1.4 million
Present Worth Cost:	\$29.7 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

This alternative includes placing a final cover and upgrading storm water controls on the southern area of the Landfill to meet Pennsylvania landfill closure requirements, but includes no changes to the existing northern area cover. The new southern area cover system would include grading to promote runoff and installation of an impermeable geosynthetic membrane ("Cap"), which would be covered by a drainage layer and 2 feet of soil, the top of which would be

- 2 The existing northern area cover was designed to incorporate only 6 inches of soil above the drainage layer, in accord with PADER's landfill closure regulations in effect when it was installed in 1986-87; see September 10, 1985 letter from PADER to SCA.

vegetated to prevent erosion. The existing cap and storm water management system on the northern area of the Landfill would be maintained.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and conveyed off-Site to the Elizabethtown Wastewater Treatment Plant (a Publicly Owned Treatment Works, or "POTW") for disposal. A sewer line and pumping station would be constructed to convey the ground water/leachate to the local sewer system.

Alternative 3: Upgrade Northern Area Cover, Install Southern Area Cover, Extract Ground Water, Discharge to POTW

Capital Cost:	\$ 5.3 million
Annual O&M Cost (years 1-30):	\$ 1.4 million
Present Worth Cost:	\$30.5 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

This alternative includes upgrading the existing northern area cover, as well as installing a new southern area final cover, to meet PADEP municipal landfill closure regulations applicable to new cap construction; and upgrading the storm water controls on both the northern and the southern areas of the Landfill. The southern area would receive a cover system including grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The northern area would receive an additional 18 inches of compacted soil (with vegetation) above the existing cover to meet PADEP municipal landfill closure regulations applicable to new cap construction.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. A sewer line and pumping station would be constructed to convey the ground water/leachate to the Elizabethtown Wastewater Treatment Plant for treatment and disposal.

Alternative 4: Install Southern Area Cover, Extract Ground Water, Treat Ground Water On-Site Using Air Stripping and Carbon Adsorption

Capital Cost:	\$ 4.3 million
Annual O&M Cost (years 1-30):	\$ 1.1 million
Present Worth Cost:	\$23.5 million
Implementation Time	
Construction Complete:	2 years

Remedial Objectives Achieved: 15-30 years

This alternative includes placing final cover and upgrading storm water controls on the southern area of the Landfill to meet current Pennsylvania municipal landfill closure requirements, but includes no changes to the existing northern area cover. The new southern area cover system would include grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The existing cap and storm water management system on the northern area of the Landfill would be maintained.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants to meet effluent limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals, air stripping for the removal of volatile organics, and carbon adsorption for the removal of semi-volatile organics and pesticides.

Alternative 5: Upgrade Northern Area Cover, Install Southern Area Cover, Extract Ground Water, Treat Ground Water On-Site Using Air Stripping and Carbon Adsorption

Capital Cost:	\$ 5.1 million
Annual O&M Cost (years 1-30):	\$ 1.1 million
Present Worth Cost:	\$24.3 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

Like Alternative 3, this alternative includes upgrading the existing northern area cover and installing a new cover over the southern areas of the Landfill, to meet current Pennsylvania municipal landfill closure requirements. The southern area would receive a cover system including grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The northern area would receive an additional 18 inches of compacted soil (with vegetation) above the existing cap to meet current PADEP municipal landfill regulations applicable to new cap construction.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants to meet effluent limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals, air stripping for the removal of volatile organics, and carbon adsorption for the removal of semi-volatile organics and pesticides.

Alternative 6: Install Southern Area Cover, Extract Ground Water, Treat Ground Water On-Site Using Air Stripping and Carbon Adsorption, Emissions Control

Capital Cost:	\$ 4.4 million
Annual O&M Cost (years 1-30):	\$ 1.2 million
Present Worth Cost:	\$25.3 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

This alternative includes placing final cover and upgrading storm water controls on the southern area of the Landfill to meet current Pennsylvania municipal landfill closure requirements, but includes no changes to the existing northern area cover. The new southern area cover system would include grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The existing cover and storm water management system on the northern area of the Landfill would be maintained.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants to meet effluent limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals, air stripping for the removal of volatile organics, and carbon adsorption for the removal of semi-volatile organics and pesticides. Volatile organic emissions from the air

stripper would be collected on vapor-phase carbon instead of being discharged to the atmosphere.

Alternative 7: Upgrade Northern Area Cover, Install Southern Area Cover, Extract Ground Water, Treat Ground Water On-Site Using Air Stripping and Carbon Adsorption, Emissions Control

Capital Cost:	\$ 5.2 million
Annual O&M Cost (years 1 -30):	\$ 1.2 million
Present Worth Cost:	\$26.1 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

Like Alternative 3, this alternative includes upgrading the existing northern area cover and installing a new cover over the southern areas of the Landfill, to meet current Pennsylvania municipal landfill closure requirements. The southern area would receive a cover system including grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The northern area would receive an additional 18 inches of compacted soil (with vegetation) above the existing cap to meet current PADEP municipal landfill regulations.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants to effluent meet limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals, air stripping for the removal of volatile organics, and carbon adsorption for the removal of semi-volatile organics and pesticides. Volatile organic emissions from the air stripper would be collected on vapor-phase carbon instead of being discharged to the atmosphere.

Alternative 8: Install Southern Area Cover, Extract Ground Water; Treat Ground Water On-Site Using UV Oxidation

Capital Cost:	\$ 3.6 million
Annual O&M Cost (years 1-30):	\$ 1.15 million
Present Worth Cost:	\$23.9 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

This alternative includes placing final cover and upgrading storm water controls on the southern area of the Landfill to meet current Pennsylvania municipal landfill closure requirements, but includes no changes to the existing northern area cover. The new southern area cover system would include grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The existing low permeability cap and storm water management system on the northern area of the Landfill would be maintained.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants to meet effluent limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals and UV oxidation (use of a strong oxidizing reagent such as hydrogen peroxide in the presence of ultraviolet radiation) for the destruction of organic contaminants.

Alternative 9: Upgrade Northern Area Cover, Install Southern Area Cover, Extract Ground Water, Treat Ground Water On-site Using UV Oxidation

Capital Cost:	\$ 4.4 million
Annual O&M Cost (years 1-30):	\$ 1.1 million
Present Worth Cost:	\$24.7 million
Implementation Time	
Construction Complete:	2 years
Remedial Objectives Achieved:	15-30 years

Like Alternative 3, this alternative includes upgrading the existing northern area cover

and installing a new cover over the southern areas of the landfill, to meet current Pennsylvania municipal landfill closure requirements. The southern area would receive a cover system including grading to promote runoff and installation of an impermeable cap, which would be covered by a drainage layer and 2 feet of soil, the top of which would be vegetated to prevent erosion. The northern area would receive an additional 18 inches of compacted soil (with vegetation) above the existing cap to meet current PADEP municipal landfill regulations.

A ground water extraction well system would be used to collect contaminated ground water and control its migration. Collected ground water would be combined with leachate and treated on-Site for removal of metals and organic contaminants (including pesticides) to meet effluent limits prior to discharge to Conoy Creek. Treatment processes would include chemical precipitation for the removal of metals and UV oxidation (use of a strong oxidizing reagent such as hydrogen peroxide in the presence of ultraviolet radiation) for the destruction of organic contaminants.

IX. COMPARATIVE EVALUATION OF ALTERNATIVES

EPA evaluated each of the remedial alternatives summarized in this ROD against the nine (9) evaluation criteria set forth in the NCP, 40 C.F.R. § 300.430(e)(9). These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. A description of the evaluation criteria is presented below:

Threshold Criteria

1. Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. Compliance with Applicable or Relevant and Appropriate Requirements ("ARARs") evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site or whether a waiver is justified.

Primary Balancing Criteria

3. Long-term effectiveness and permanence considers the ability of an alternative to maintain protection of human health and the environment over time, and the reliability of such protection.
4. Reduction of Toxicity, Mobility, or Volume through treatment evaluates an alternative's use of treatment to reduce the harmful effects of principle contaminants, their ability to move in the environment, and the amount of contamination present.
5. Short-term effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. Implementability considers the technical and administrative feasibility of implementing the alternative, such as relative availability of goods and services.
7. Cost includes estimated capital and operation and maintenance costs, as well as present worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollars.

Modifying Criteria

8. State acceptance considers whether the State agrees with U.S. EPA's analyses and recommendations of the RI/FS and the Proposed Plan.
9. Community acceptance is addressed in Section XIII of this ROD (Responsiveness Summary). The Responsiveness Summary presents public comments and U.S. EPA responses to those comments.

Table 4 compares each alternative in relation to the NCP evaluation criteria. The following analysis profiles the performance of the alternatives against the evaluation criteria.

Overall Protection of Human Health and the Environment

Alternatives 4 through 9 all provide overall protection of human health and the environment. These alternatives provide alternate water supplies to downgradient residences until ground water remedial action objectives are met and also provide deed restrictions to minimize the potential for direct contact with the Landfill's contents; protect the Landfill cap; and prohibit use of the water supply well located at the Landfill for provision of drinking water. These alternatives also address the impacts of contaminated ground water on surface water and the associated ecological risks. Monitoring of ground water, surface water, and sediments would enable detection of reemerging risks in the future should they occur. Wetlands monitoring would assess whether ground water extraction would impact existing wetland hydrology.

Alternative 1 does not address potential risks to humans from future use of ground water nor current and potential ecological risks to Conoy Creek and its tributaries around the Landfill.

Alternatives 2 and 3 include disposal of contaminated ground water/leachate through the Elizabethtown POTW. However, this POTW is not designed to remove many of the site-related contaminants. Although there would be some incidental removal of ground water contaminants, the ultimate fate and cross-media impacts of metals (e.g., in sludge), volatile organics (e.g., air emissions), and other compounds (e.g., untreated discharges to surface water) is uncertain. Consequently, overall protectiveness for this alternative is rated lower than the alternatives designed specifically to remove contaminants present in the ground water/leachate.

Compliance With ARARs

For an alternative to be recommended by EPA in the proposed plan or selected in the ROD, Section 121 (d) of CERCLA requires that it comply with all "applicable," or "relevant and appropriate," federal environmental requirements; and all promulgated, consistently enforced applicable or relevant and appropriate State environmental requirements to the extent they are more stringent than federal requirements; unless the alternative qualifies for a waiver in accordance with the statute and the NCP ("ARARS"). ARARs include cleanup standards, standards of control, and other substantive federal and State environmental protection requirements, criteria, or limitations that specifically address problems or situations found at CERCLA sites. "Applicable" requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site; "relevant and appropriate" requirements are those requirements that, while not legally "applicable" do address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action. 3 Appendix IV lists various federal and state laws and regulations which EPA has determined are ARARs for this remedial action. 4

There are generally three distinct categories of ARARs: chemical-specific (requirements applicable because of the presence of particular contaminants at the Site), location-specific (requirements applicable because of the particular locale of the Site), and action-specific (requirements applicable because of the cleanup techniques being used at the Site).

Chemical-specific ARARs

The principal chemical-specific ARARs relevant to the Site remediation concern the cleanup levels for ground water and surface water, and require consideration of several federal and Commonwealth statutes and regulations. Preliminarily, CERCLA itself specifically provides that remedial actions

shall require a level or standard of control which at least attains the Maximum Contaminant Level Goals ["MCLGs"] established under the (Federal) Safe Drinking Water Act, [42 U.S.C. § 300(f) - 300(j)-26, (SDWA)] and water quality criteria established under Section 304 or 303 of the Clean Water Act [33 U.S.C. § 1314 or 1315], where such goals or criteria are relevant and appropriate under the circumstances of the release or threatened release.

42 U.S.C. § 96121(d)(2)(A).

3 See Section 300.400(g) of the NCP, 40 C.F.R. § 300.400(g).

4 Appendix V lists certain other federal and Commonwealth guidances and other advisories which are "to be considered" ("TBC") in conducting this remedial action.

Section 300.430(e)(2)(I)(B) of the NCP expands upon this provision of CERCLA, specifying that at Superfund sites whose ground or surface waters are current or potential sources of drinking water, all non-zero MCLGs shall be met in such waters to the extent they are relevant and appropriate; and that to the extent a non-zero MCLG is not relevant and appropriate for a given contaminant, the MCL for that contaminant shall be met in the surface and ground water to the extent relevant and appropriate. 40 CFR § 300.430(e)(2)(I)(B) (citing 40 C.F.R. § 141). 5 EPA has determined that a number of non-zero MCLGs and MCLs are "relevant and appropriate" to the cleanup of ground water at the Site.

PADEP has identified two chemical-specific standards, based on two Commonwealth statutes and their respective implementing regulations, as potential ARARs for ground water at the Site: the Pennsylvania Safe Drinking Water Act, 35 P.S. § 721 et seq. ("PASDWA"), and its regulations, 25 Pa. Code 109 et seq.; and Act 2, 35 P.S. §§ 6026.101-6026.909, including its recently issued statewide, health-based remediation standards, 25 Pa. Code 250.301 et seq. (27 Pa. Bull. 4181, August 16, 1997)("Act 2 Standards").

PASDWA is modeled on, and largely parallels, the Federal SDWA. One difference between the federal and Commonwealth statutes is that the Commonwealth has adopted as enforceable standards most of the SDWA's Secondary Maximum Contaminant Levels ("SMCLs"), which are not enforceable under the SDWA itself. See 25 Pa. Code § 109.202. 6 EPA has determined that the PASDWA manganese standard of 50 Ig/l is applicable to any Site-related contamination identified in the Masonic Homes' drinking water wells (because its system serves more than 25 individuals and thus comprises a public water supply under the PASDWA), and that it is otherwise relevant and appropriate to the Elizabethtown remediation because of the present and potential future use of the aquifer as a source of drinking water. See Appendix VI

PADEP has asserted, and EPA accepts, that the Act 2 Standards for manganese (50 Ig/l), and lead (5 Ig/l) comprise ARARs for ground water cleanup.

Concerning ARARs pertinent to surface water, each of the following regulations is applicable to the waters of Conoy Creek and discharges thereto, and therefore must be complied with by this remedial action: Pennsylvania's Water Quality Standards, 25 Pa. Code Ch. 93.1 - 93.9; Water Quality Toxics Management regulations, 25 Pa. Code Ch. 16; Wastewater Treatment Regulations, 25 Pa. Code §§ 95.1 - 95.3, and Pennsylvania's NPDES regulations, 25 Pa. Code § 92.31. See also Section 300.430(e)(2)(i)(E) of the NCP (requiring water quality criteria established pursuant to Sections 303 or 304 of the Federal Clean Water Act and implemented through state water quality standards be attained to the extent relevant and appropriate). See Appendix III.

5 Under the SDWA, MCLGs represent the level at which no known or anticipated adverse human health effects may occur, with an adequate margin of safety. MCLs comprise the enforceable national primary drinking water standards, and set the maximum permissible concentration in water that may be delivered to any user of a public water system, (i.e. one which regularly serves 25 or more individuals). The SDWA requires EPA to set the MCL for a particular contaminant as close as feasible to the MCLG, taking into account cost and feasibility. 42 U.S.C. § 300f(4).

6 SMCLs issued under the SDWA, see 40 C.F.R. § 143.3, establish guidelines for the states to incorporate as they see fit into their own drinking water standards, and we set at levels intended to maintain certain aesthetic qualities of drinking water (i.e. color, odor, and taste).

Alternatives 2 through 9 are expected to lower the concentrations of contaminants in surface and ground water to required cleanup levels over time, thereby meeting chemical-specific requirements discussed above. Alternative 1 does not comply with chemical-specific requirements because "no action" (i.e. not removing contaminated ground water nor installing and upgrading cap, nor other measures) is not expected to lower the concentration of contaminants in ground water to required levels within a reasonable period of time.

Additional chemical-specific ARARs are listed in Appendix IV.

Location-Specific ARARs

EPA has not identified any location-specific ARARs pertinent to this remedial action.

Action-Specific ARAR-s

Concerning action-specific requirements, EPA has determined that Section 4004 of the

Federal Resource Conservation and Recovery Act, as amended ("RCRA"), 42 U.S.C. § 6944 (including the national Municipal Landfill Closure Criteria, 40 C.F.R. § 258.60), and PADEP's Municipal Landfill closure regulations, 25 Pa. Code § 273.234 (to the extent they impose more stringent or different, standards than are imposed under the federal law), are ARARs for the cap to be built over the southern portion of the Landfill the Site. 7 Alternatives 3, 5, 7, and 9 include upgrading and installing a landfill cover system to fully meet these standards on both the previously capped northern area, and the uncapped southern area, respectively. Alternatives 2, 4, 6, and 8 require only that a cap be built over the southern portion of the Landfill that would meet the current closure requirements, and would leave the northern cover as is.

At the time EPA issued the Proposed Plan it concurred with PADEP's position that Alternatives 2, 4, 6, and 8 did not meet the Commonwealth's RCRA closure regulations, and thus did not comply with ARARs. After reviewing public comment on this issue and consulting further with PADEP, EPA has determined that the existing cap over the northern area of the Landfill remains protective of human health and the environment, and that upgrading the cap would likely create at least short term risks to the public health and welfare without gaining any appreciable benefit. 8 Therefore, EPA has determined that 25 Pa. Code § 273.234 is relevant but not appropriate to the portion of the Site covered by the existing cap. Consequently the capping elements of Alternatives 2 through 9 would each meet pertinent ARARs.

7 Neither the federal nor the Commonwealth criteria and regulation, respectively, is "applicable," because both took effect after the Landfill stopped accepting wastes.

8 The northern cap was installed by SCA pursuant to a design approved of by PADER as being consistent with Pennsylvania's municipal landfill closure regulations then in effect. See September 10, 1985 letter from PADER to SCA. See Section XII. Documentation of Significant Changes below.

Another group of action-specific ARARs pertinent to the Elizabethtown Landfill Site remedial action are various Pennsylvania regulations which govern air emissions from the type of air strippers which are required by each of the remedial alternatives considered for ground water and leachate treatment. All such air strippers used on remediation projects are required to use the Best Available Technology to control emissions of certain gases, including volatile organic compounds ("VOCs"), and particulate matter. 9 Although VOC emissions are expected to be low, Alternatives 4 and 5 do not meet this action-specific ARAR and therefore cannot be selected.

Finally, each of the alternatives that includes on-Site treatment of contaminated ground water and leachate, followed by discharge of treated effluent into Conoy Creek, must meet the functional limits for an industrial waste discharger under the Pennsylvania Clean Streams law and the Federal Clean Water Act. 10

Additional action-specific ARARs are listed in Appendix IV.

Long-term Effectiveness and Permanence

Alternatives 2 through 9 are expected to achieve ground water remedial goals in about the same length of time. Alternatives 3, 5, 7, and 9 provide the greatest level of long-term effectiveness and permanence because the entire Landfill (northern and southern areas) would have a final cover system that is designed and constructed to prevent infiltration and weather (freeze/thaw) damage over the long term in accord with current capping requirements. Alternatives 2, 4, 6, and 8 provide similar characteristics in achieving remedial action objectives for ground water and surface water cleanup, but the long-term integrity of the northern area cover is potentially less reliable due to potential freeze/thaw damage. Alternative 1 would not be effective in cleaning up contaminated ground water (no source or plume control) or preventing future migration of contaminants (uncapped southern area of the Landfill) and therefore does not meet this criterion.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 2 through 9 all provide some reduction of toxicity, mobility or volume through treatment of extracted ground water. Alternative 1 provides negligible amounts of reduction through continued treatment of leachate.

9 Among the action-specific ARARs EPA, in consultation with PADEP, has identified for the air stripper are: The Air Pollution Control Act, Act of January 8, 1960 P.L. 2119, 35 P.S. § 4001, et. seq., and 25 Pa. Code Chs. 121 - 143, including specifically Pa. Code title 25 §§ 123.1 &

123.2 (requirements for fugitive emissions and specific limitations for particulate matter, and visible emissions), (25 Pa. Code Title 127.12(a)(5) (requirements regarding construction, modification, reactivation, and operation of sources, including air strippers); and National Emissions Standards for Hazardous Air Pollutants, 40 C.F.R. 61.64(b)).

10 Functional discharge limits which must be met for any treated effluent discharged into the Conoy Creek are set by PADEP pursuant to its Clean Streams Law, 35 P.S. 691.1 et. seq., and 25 Pa. Code 92, through which the Commonwealth implements the NPDES program.

The treatment systems employed with Alternatives 6 and 7 (air stripping plus vapor phase and liquid phase carbon adsorption) and with Alternatives 8 and 9 (UV oxidation) would greatly reduce contaminants' mobility and would destroy many of the organic contaminants present in the ground water/leachate. Without vapor phase carbon for emission control, Alternatives 4 and 5 provide less reduction in the mobility of volatile organics compounds.

Alternatives 2 and 3 depend on the existing treatment processes at the Elizabethtown POTW to achieve contaminant reduction. However, the POTW's treatment Processes are designed only to remove conventional pollutants, not metals, pesticides, site-specific volatile organics, or site-specific semi-volatile organics. Consequently, only incidental removal would be achieved and these two alternatives rank the lowest on this evaluation criteria, ahead only of the "no further action" alternative.

Short-term Effectiveness

Alternatives 2 through 9 are expected to achieve ground water remedial goals in about the same length of time. The length of time in which Alternative 1 would achieve ground water remedial action objectives is very long and therefore this alternative is not effective in the short-term. During implementation, Alternatives 3, 5, 7, and 9 would be expected to create additional dust and noise while the existing cover over the northern area of the Landfill is upgraded, so short-term effectiveness is slightly reduced when compared to Alternatives 2, 4, 6, and 8 which include only upgrading the southern area cover. Additionally, the existing cover could be harmed while construction is underway, resulting in potential exposure risks for Site workers. Alternatives 2 and 3 have reduced short-term effectiveness because some ground water contaminants may not be effectively removed by the POTW and therefore may be released to the environment.

Implementability

Alternative 1 is the easiest alternative to implement because no new actions are required. Alternatives 4, and 6 are also relatively easy to implement because only the southern area cover requires upgrading. Extra precautions and planning would be required to upgrade cover on the northern area of the Landfill in Alternatives 3, 5, 7, and 9.

UV Oxidation is expected to require more extensive monitoring and maintenance than air stripping and carbon adsorption, therefore Alternatives 8 and 9 score slightly lower than Alternatives 3 through 7.

Neither the Elizabethtown POTW nor its receiving sewers have sufficient excess hydraulic capacity to accept the ground water/leachate from the Landfill, so EPA does not consider Alternatives 2 and 3 (as defined in the FS) to be implementable.

Cost

The estimated present worth costs of the nine alternatives are summarized in the evaluation table (Table 4). Alternative 1 has the lowest estimated present worth cost and Alternatives 2 and 3 have the highest. As noted above, because of the change in ground water cleanup levels from that on which the cost estimate in the FS (and the evaluation table) were based, the cost estimates for Alternatives 2 through 9 are likely conservative. Nevertheless, the change in clean-up standards will alter the cost of remediation for each alternative (other than the "no action" alternative) by about the same factor. Thus the cost estimates in the FS remain appropriate for comparing the costs of the alternatives notwithstanding the fact that the cleanup standards on which they were based have changed. Within the accuracy of the estimates, Alternatives 4 through 9 are comparable. For each treatment combination, the option to upgrade the cover on both the northern and southern areas is more expensive than to upgrade the cover on the southern area alone.

State Acceptance

The Commonwealth of Pennsylvania has been consulted throughout the investigation of the Elizabethtown Landfill Site and supports EPA's selection of the remedy identified in this ROD.

Community Acceptance

The Proposed Plan for the Elizabethtown Landfill Site, identifying Alternative 7 as EPA's preferred alternative, was released for public comment on July 28, 1995. EPA reviewed all the oral and written comments submitted during the official public comment period, which began on July 28, 1995 and closed on August 27, 1995. Oral comments received during EPA's August 23, 1995 public meeting about the Proposed Plan were generally supportive of EPA's preferred alternative. Two parties -- the Landfill's owner, Waste Management; and the Masonic Homes, an adjacent property owner -- submitted substantial written comments objecting to certain aspects of EPA's preferred alternative. The Responsiveness Summary of this ROD, as well as Section XII. (Documentation of Significant Changes) addresses the comments received during the official comment period, as well as information which EPA received after the close of the comment period, which it considered and acted upon in accord with applicable provisions of the NCP. 11

11 On September 29, 1997 EPA received two letters from attorneys representing New Standard Corporation and Furnival Machinery Company, respectively, each of which requested that EPA delay issuing any ROD and meet with them to further discuss remedial options for the Site. Specifically, both commenters assert that EPA's risk assessment overestimates the risk at the Site, particularly in light of EPA's September 4, 1997 data addenda, and that it does not accord with current EPA policies for remediations. After reviewing these comments, EPA has determined that they do not alter its conclusions regarding the appropriate action to be taken at the Site. As this ROD explicitly states, the Site merits response action because of the potential future risk it poses, a conclusion which is not undercut by data from area drinking water wells concerning current risk. As always, EPA will consider any new information submitted concerning the appropriate response action to be taken, in accord with the provisions of CERCLA and the NCP, and has offered to meet with these parties to discuss their concerns further.

X. THE SELECTED REMEDY AND PERFORMANCE STANDARDS

Based upon consideration of information available for the Elizabethtown Landfill Site, including the documents contained in the Administrative Record; its evaluation of risks posed by the Site, the requirements of CERCLA and the NCP; the detailed analysis of alternatives; and public comments it has received, EPA has selected a modified version of Alternative 6 as the remedy to be implemented at the Elizabethtown Landfill Site. The selected remedy includes the following components:

- Capping the uncapped portion of the Landfill (the southern portion of the Landfill) with a cap designed in accordance with the Pennsylvania Municipal Waste Management Regulations, 25 Pa. Code Ch. 273; and Criteria for Municipal Solid Waste Landfills, 40 C.F.R. § 258, issued pursuant to the Federal Resource Conservation and Recovery Act, as amended ("RCRA"), 42 U.S.C. §§ 6901 - 6922(k);
- Upgrading of storm water controls in both the northern and southern Landfill areas;
- Conducting a predesign study of the ground water and surface water to evaluate the effectiveness of the above remedial measures on the attainment of ground water and surface water cleanup levels set forth in this ROD, and to furnish data necessary to determine appropriate locations for a ground water extraction well(s);
- Construction of a ground water extraction well system; extraction and on-Site treatment of contaminated ground water and leachate; and discharge to Conoy Creek in accordance with functional effluent limits established under the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et. seq. The on-Site treatment plant shall include the following treatment processes:
 1. Precipitation (to remove metals);
 2. Air stripping with air controls (to remove volatile organic compounds); and
 3. Liquid phase carbon adsorption (to remove semi-volatile organic compounds and pesticides);

Provided, however, that if after the Landfill cap is installed the predesign ground water and surface water study described above demonstrates that the ground water and surface water cleanup levels set forth in this ROD can be attained within a reasonable time period, as determined by EPA, without extraction and treatment of ground water, then EPA will modify the ROD to eliminate the requirement for such extraction and treatment;

- Extension of the security fence to surround the entire Landfill;
- Establishment of deed restrictions to protect the Landfill cap, minimize the potential for direct contact with Landfill contents, and prohibit use of the water supply well located at the Landfill for the provision of drinking water;
- Ground water, surface water, sediment, and wetlands monitoring;
- Installation of landfill gas and leachate management systems in the southern portion of the Landfill;
- Maintenance of cover, storm water, landfill gas, leachate, security, and other existing landfill systems; and
- Quarterly monitoring of five residential wells and two public water supply wells which are listed in Appendix I and shown in Figure 5. An alternate source of drinking water or treatment shall be provided for any of these wells in which EPA determines that contaminants attributable to the Landfill are found which exceed the action levels set forth in Appendix VI herein.

The predesign ground water and surface water study included in this selected remedy was not explicitly provided for in EPA's Proposed Plan. In response to public comment EPA is specifying that an enhanced predesign ground water and surface water study is included as an element of the selected remedy for the Site. The objective of the predesign study is as follows:

- To further define the extent of contamination surrounding the Landfill including property located north of Conoy Creek;
- To further define the "background" concentration of manganese and determine whether elevated manganese concentrations in local drinking water wells are attributable to the Landfill;
- To evaluate the effect of "natural attenuation" on the attainment of ground water and surface water cleanup levels specified in Section X, Paragraph D, below;
- To evaluate the effect of capping the uncapped portion of the Landfill and improving the storm water controls on the attainment of ground water and surface water Cleanup Levels as provided in Section X, Paragraph D, below; and
- To determine appropriate locations for extraction well(s) for a ground water pumping system.

The ground water treatment system included in the selected remedy incorporates chemical precipitation of metals, air stripping of volatile organics with emissions control using vapor phase carbon, and liquid phase carbon adsorption of semi-volatiles, pesticides, and miscellaneous contaminants. The system shall discharge treated ground water and surface water to Conoy Creek in accordance with functional effluent limits set under the Pennsylvania Clean Streams Law, 35 P.S. § 691.1 et. seq., and will meet Pennsylvania air emission limits, as determined by PADEP. At this time it is not apparent whether the liquid phase carbon adsorption process will need to be included in the treatment train in order to meet these discharge limits. If, after PADEP calculates the effluent limits for the on-site treatment plant, the liquid phase carbon adsorption process is demonstrated, to the satisfaction of EPA and PADEP, to be unnecessary to meet the PADEP surface water discharge requirements in a reliable and consistent manner, then EPA may approve its deletion.

PERFORMANCE STANDARDS

A. Southern Area Landfill Cap

A cap shall be placed over the portion of the Landfill that presently is not covered by a multi-layer clay and soil engineered cap. The cap shall cover all the uncapped areas of the Landfill where refuse has been disposed. The cap shall be designed and constructed in

accordance with the Pennsylvania Municipal Waste Management Regulations, 25 Pa Code Ch. 273.234. The cap shall:

- Prevent vectors, odors, blowing litter and other nuisances;
- Be capable of allowing loaded vehicles to successfully maneuver over it after placement;
- Be non-combustible,
- Be capable of supporting the germination and propagation of vegetative cover;
- Compact well and not crack excessively when dry; and
- Have a permeability of no greater than 1×10^{-5} cm/sec in accordance with 40 C.F.R. § 258.60 (Federal Municipal Solid Waste Landfill Closure Criteria).

B. Upgrading Storm Water Controls

Engineering controls shall be constructed or upgraded at the Landfill to control surface water to minimize erosion of the Landfill cap and to prevent storm water runoff from detrimentally impacting properties adjacent to the Landfill. Such engineering controls must be designed based on the 24-hour precipitation event in inches to be expected once in 25 years.

C. Predesign Ground Water and Surface Water Study

The predesign ground water and surface water study shall:

- Further define the extent of contamination surrounding the Landfill including property located north of Conoy Creek;
- Further define the "background" concentration of manganese and determine whether elevated manganese concentrations in local drinking water wells are attributable to the Landfill;
- Evaluate the effect of "natural attenuation" on the attainment of ground water and surface water Cleanup Levels as provided in Section X Paragraph D, below;
- Evaluate the effect of capping the uncapped portion of the Landfill and improving storm water controls, on the attainment of ground water and surface water Cleanup Levels as provided in Section X, Paragraph D, below; and
- Determine appropriate locations for extraction well(s) for a ground water pumping system.

D. Ground Water Extraction System

The ground water extraction system shall be designed and operated to attain the ground water and surface water cleanup levels that are specified in Appendices II and III, respectively ("Cleanup Levels"). Such Cleanup Levels shall be attained throughout the "Area of Attainment," which is defined as the area of the Site at and beyond the boundary of the original Landfill property. (The original Landfill property is depicted in Figure 6 and described in Attachment A.)

Attainment of the Cleanup Levels shall be demonstrated by means of twelve consecutive quarters of monitoring conducted in accordance with Paragraph H below. If sampling performed in accordance with Paragraph H confirms that the Cleanup Levels have been achieved throughout the Area of Attainment and remain at the required levels for twelve consecutive quarters, operation of the extraction system may be suspended. If subsequent to the extraction system shutdown, monitoring performed in accordance with Paragraph H shows that any of the Cleanup Levels specified in Appendices II or III have been exceeded, the extraction system shall be restarted and operated until such Cleanup Levels have once more been attained for twelve consecutive quarters.

The ground water extraction system shall be designed and operated such that it does not detrimentally impact the water supply or water quality of existing drinking water wells located near the Site and does not detrimentally impact Conoy Creek or its tributaries.

E. On-site Treatment System

The air stripper must be designed and operated in accordance with 25 Pa. Code Ch. 127, Subchapter A. Those regulations require that emissions be reduced to the minimum obtainable levels through the use of best available technology, as defined in 25 Pa. Code § 121.1.

The treatment plant shall be designed and operated in accordance with the substantive requirements of Section 402 of the Clean Water Act, 33 U.S.C. § 1342, and the National Pollutant

Discharge Elimination System ("NPDES") discharge regulations set forth at 40 C.F.R. Parts 122-124, the Pennsylvania NPDES regulations (25 Pa. Code § 92.31, and the Pennsylvania Water Quality Standards (25 Pa. Code §§ 93.1-93.9). The treatment system shall be designed and operated so that discharge from the treatment system is not detrimental to Conoy Creek.

F. Security Fence

The existing security fence shall be extended to prevent access to all portions of the Site where refuse has been disposed.

G. Deed Restrictions

Deed restrictions shall be established which prohibit excavation or disturbance of the Landfill cap or landfilled materials for reasons other than studying the Site or remediating the Site in accordance with this ROD. Deed restrictions shall be established which prohibit use of the water supply well, which is located on the Landfill property, for provision of drinking water. Deed restrictions shall be established which prohibit drilling any water supply wells on the Landfill property. Such deed restrictions shall be approved by EPA and shall be placed in the deed to the Landfill property by filing said restrictions with the Recorder of Deeds of Lancaster County.

H. Ground Water, Surface Water, Sediment, and Wetlands Monitoring

A long-term monitoring program shall be implemented to evaluate the effectiveness of the Landfill cap, and the ground water extraction and treatment system and to monitor the impact of the remedial action on the Conoy Creek watershed. A plan for the long-term monitoring shall be developed during the design phase. The plan shall include the collection of a sufficient number of ground water, surface water, and sediment samples and data such as ground water elevations, to monitor the effectiveness of the Landfill cap, and the ground water extraction and treatment system and to monitor the impact of the remedial action on the Conoy Creek watershed. EPA will determine the number and location of sample and data collection points necessary to verify the performance of the remedial action. The installation of ground water monitoring wells will be required. Numbers and locations of these monitoring wells will be determined by EPA during the remedial design.

EPA will also determine the parameters for analysis. Such parameters shall include but not be limited to the following:

Ground water

Benzene
Chlorobenzene
1,1-Dichloroethene
1,2-Dibromo-3-Chloropropane
Methylene chloride
Tetrachloroethene
Trichloroethene
Vinyl Chloride
bis(2-Ethylhexyl)phthalate
bis(2-chloroethyl)ether
Arsenic
Barium
Lead
Manganese
Thallium

Surface Water

Arsenic
Cyanide
Lead
Chlorobenzene
Methylene chloride
Tetrachloroethene
bis(2-Ethylhexyl)phthalate
2-Chlorophenol
Aldrin
4,4'-DDD
Endrin

Sediment
Chlorobenzene
Arsenic
Endrin
Benzene
1,1-Dichloroethene
1,2-Dibromo-3-Chloropropane
Methylene chloride
Tetrachloroethene
Trichloroethene
Vinyl Chloride
bis(2-Ethylhexyl)phthalate
bis(2-chloroethyl)ether
Barium
Cyanide
Lead
Manganese
Thallium
Aldrin
4,4'-DDD

The ground water, surface water, and sediments shall be sampled quarterly for the first three years. Based on the findings of the first three years of sampling, the appropriate sampling frequency for subsequent years will be determined by EPA. Sampling shall be conducted for a minimum of twenty years, or such longer time as EPA may determine is appropriate. The parameters for analysis shall include but not be limited to those listed on the target compound list and target analyte list.

Long-term monitoring shall be implemented to ensure that the remedial action causes no adverse affects on Conoy Creek. The monitoring will look for reduction in surface water habitat, decrease in abundance, diversity, and density of wetland habitat; and the level and toxicity of Site related contaminants in the surface water and sediment. A plan for such monitoring shall be developed during the design phase and will be approved by EPA.

I. Landfill Gas and Leachate Management Systems

In the southern portion of the Landfill, landfill gas and leachate management systems shall be designed, constructed and operated in accordance with 25 Pa. Code Ch. 273. The landfill gas venting system shall be operated in accordance 25 Pa. Code Ch. 127. The number and location of gas vents shall be determined during remedial design. Perimeter gas monitoring probes shall be installed to monitor the potential migration of landfill gas.

J. Maintenance of Landfill Systems

The landfill cover, storm water management, gas collection, leachate management, security, and other landfill systems shall be maintained in accordance with 25 Pa. Code Ch. 273. An operation and maintenance plan for these landfill components shall be developed during the remedial design phase and will be approved by EPA.

K. Monitoring Drinking Water

Drinking water from the residential and public water supply wells that are listed in Appendix I shall be sampled on a quarterly basis for the first three years. Based on the findings of the first three years of sampling, the appropriate sampling frequency for subsequent years will be determined by EPA. Sampling shall be conducted for a minimum of twenty years, or such longer time as EPA may determine is appropriate. The parameters for analysis shall include but not be limited to those listed on the target compound list and target analyte list.

An alternate source of drinking water or treatment of these wells shall be provided if any of the action levels listed in Appendix VI are exceeded for three consecutive rounds of sampling, provided that EPA determines that the exceedence is attributable to the Landfill.

L. Five Year Reviews

Five Year reviews shall be conducted after the remedy is implemented to assure that the remedy continues to protect human health and the environment.

XI. STATUTORY DETERMINATIONS

This remedy satisfies the remedy selection requirements of CERCLA and the NCP. The remedy is expected to be protective of human health and the environment, complies with ARARs, is cost effective, utilizes permanent solutions, and includes treatment as a principle element of the remedy. The following is a brief discussion of how the selected remedial action addresses the statutory requirements.

A. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy will ensure protection of human health and the environment by capping the Landfill and, if necessary, pumping and treating contaminated ground water and leachate throughout the Site. These engineering measures will be designed to control the release of hazardous substances from the Landfill so that human health and the environment are protected by attaining the Clean-up Levels specified in Appendices II and III. Long-term monitoring of drinking water, and provision of alternate sources of drinking water or treatment of contaminated drinking water wells if action levels specified in Appendix VI are exceeded, will also ensure that human health is adequately protected.

B. Compliance with ARARs

The selected remedy will attain all applicable or relevant and appropriate requirements for the Site. These requirements are shown in Appendix IV.

C. Cost Effectiveness

The estimated present worth cost of the selected remedy is \$25.7 million. EPA believes that the selected remedy most effectively addresses contaminated ground water and surface water while minimizing costs.

D. Utilization of Permanent Solutions and Alternate Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized while providing the best balance among the other evaluation criteria.

E. Preference for Treatment as a Principal Element

On-site treatment of extracted ground water is a principal component of the selected ground water remedy. This remedy, therefore satisfies the statutory preference for treatment as a principal element.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

On July 28, 1995 EPA issued a Proposed Plan for the Elizabethtown Landfill Site, in which the Agency presented Alternative 7, described herein, as its preferred alternative for remediating the Site. A public comment period on the Proposed Plan began on July 28, 1995 and closed on September 27, 1995. As discussed above, in response to comments received during the public comment period, EPA is selecting a remedy for the Site that differs from the preferred Alternative EPA presented in the Proposed Plan in three principal respects: 1) EPA has determined that upgrading the existing cap on the northern area of the Landfill is not required under CERCLA's ARARs requirements, (2) alternative water supplies shall be provided to the previously identified residents and the public water supply whose drinking water wells EPA determines contain Site-related contamination which exceed the action levels set forth in Appendix VI herein, and 3) EPA has decided to conduct an enhanced predesign study of the surface and ground water, which will allow it to evaluate whether ground water extraction and treatment continues to be the appropriate remedy for the Site.

The Proposed Plan identified Alternative 7 as the preferred remedy, which included the requirement to upgrade the existing landfill cap on the northern portion of the Landfill to comply with current PADEP municipal waste landfill regulations applicable to new cap construction. The existing cap consists of (from bottom to top) two feet of compacted clay, a six inch sand drainage layer, and a six inch vegetated topsoil cover. Upgrading the existing cover to comply with current PADEP requirements would entail removing the existing six inch vegetated topsoil layer and replacing it with a two foot thick vegetated topsoil layer. See 25 Pa. Code § 273.234. After considering public comments, EPA has decided that replacing the existing six inch

vegetated topsoil layer with a two foot vegetated topsoil layer would present a greater environmental risk than is presented by the existing landfill cap, as the process of removing the top layer of the existing cap could allow surface water and sediment to runoff of the Landfill onto surrounding properties and water bodies including Conoy Creek. Additionally, during the time period in which the established vegetative cover would be removed and replaced with new seeding, the Landfill would be susceptible to wind and surface water erosion that could detrimentally effect neighboring properties. Therefore the Agency has determined that the environmental risks involved with replacing the cap render 25 Pa. Code Ch. 273 not appropriate for the existing northern cap, and thus the Agency will not require that the northern portion of the cap to be upgraded, and instead is choosing Alternative 6 (with slight modifications as further described below) as the selected remedy for the Site.

Concerning the provision of alternative drinking water supplies, in the Preferred Alternative that was presented in the Proposed Plan EPA had specified that bottled water would be supplied to five residences around the Landfill for drinking water. After considering public comments, EPA is modifying this provision of the remedy. The selected remedy includes quarterly monitoring of the drinking water wells from the five residences surrounding the Landfill plus two public water supply wells located on the Masonic Homes' property, near the Landfill. An alternate source of drinking water, or treatment of contaminated drinking water wells, will be supplied should monitoring reveal that the action levels listed in Appendix VI are exceeded in any of these wells, provided that EPA determines that the exceedence is attributable to the Landfill.

The final principal change from EPA's Preferred Alternative presented in the Proposed Plan concerns the pump and treat component of the selected remedy. As explained in more detail in Section X, this ROD provides for an enhanced predesign study of ground water and surface water at the Site. If, based on this study, EPA finds that the ground water and surface water Cleanup Levels can be achieved as provided in Section X. Paragraph D above, within a reasonable time period, without extraction and treatment of ground water, EPA shall modify the ROD to eliminate the requirement for such extraction and treatment.

PART III - RESPONSIVENESS SUMMARY

Comments raised during the public comment period on the Proposed Plan for the Elizabethtown Landfill Site are summarized in this Responsiveness Summary, as well as certain comments and submissions submitted after the public comment period. On July 28, 1995 EPA released the Proposed Plan for the Elizabethtown Landfill Site to the public for the required 30 day public comment period. EPA held a public meeting to discuss the Proposed Plan on August 23, 1995 during which representatives from EPA answered questions about the Site and the cleanup alternatives under consideration. In response to public request and in accord with CERCLA, EPA extended the comment period until September 26, 1995. The Masonic Homes and Waste Management each submitted written comments addressing EPA's Proposed Plan within this public comment period.

Section I of this Responsiveness Summary addresses the oral comments that were raised during the public meeting. A transcript of the public meeting is included in the Administrative Record for the Site.

Two sets of written comments were submitted during the extended comment period. One from the Masonic Homes, a major land owner located near the Site, and one from Waste Management. EPA's responses to these comments are contained in Sections II and III of the Responsiveness Summary, respectively. These comments have also been included in the Administrative Record for the Site. In part in response to comments received during the formal comment period, EPA conducted additional sampling and analyses of ground water monitoring and drinking water supply wells at and near the Site. The results of the sampling have been included in the administrative record.

Following the close of the formal public comment period on September 26, 1995, the Masonic Homes and Waste Management submitted additional comments on the Proposed Plan, (including critiques of the other's submissions), as did West Donegal Township and Congressman George W. Gekas. As detailed below, these commenters addressed a number of issues, including: the adequacy of the RI (particularly with regard to whether the Landfill has caused elevated levels of manganese in the Masonic Homes drinking water supply), and the effect of ground water pumping and treating on the achievement of Site cleanup goals and on existing water supply wells in the area. EPA has considered these comments in accordance with applicable provisions of CERCLA and the NCP.¹²

Additionally, Waste Management submitted to EPA an "Alternate Remedial Plan" dated August 21, 1996 ("ARP"). The ARP presented an alternative for remediating the Site, which Waste Management had not included in its Feasibility Study. An extensive ground water study, an asphalt landfill cap, and provision of alternate drinking water supplies to Bainbridge Road residents, are some of the major components of the Alternate Remedial Plan. The Borough of

¹² See 40 C.F.R. § 300.430(f)(3)(ii).

Elizabethtown and the Masonic Homes submitted letters to EPA endorsing the ARP. Congressman George W. Gekas also submitted comments on Waste Management's ARP.

EPA has evaluated and considered the ARP and comments thereon and has incorporated several of the ARP's principal concepts into its selected remedy, including not requiring the northern cap to be upgraded, and the enhanced predesign ground water and surface water study.

All pre- and post-comment period comments have been included in the administrative record in accordance with the NCP.

A. ORAL COMMENTS FROM THE AUGUST 23, 1995 PUBLIC MEETING; EPA'S RESPONSES

1. A representative of the Masonic Homes asked if the graphic depiction of the plume of contamination, which was presented in a overhead slide, is based on a computer-generated model that projected the extent of contamination.

EPA Response: No, the overhead is a generalized diagram. It is a very simplified drawing based on much more detailed diagrams presented in the Remedial Investigation Report. The diagrams are based on information taken from monitoring wells around the Site that collect ground water samples from different elevations under the Landfill.

2. A representative of the Masonic Homes asked if EPA knows whether the contamination extends beyond the plume of contamination depicted in the graphic.

EPA Response: No, on the graphic depiction of the plume, the outer limits of contamination are shown as dashed lines with question marks because the exact limits of the contaminant plume are not precisely defined. The figure indicates where the known contamination is now located and in what direction it is headed.

3. A citizen asked for an explanation of one provision of the preferred alternative - the establishment of deed restrictions to protect remedial systems and prevent future exposure.

EPA Response: EPA commonly includes the establishment of deed restrictions in its selected remedy for landfill sites. The purpose of the deed restriction is to protect the integrity of the landfill cap and prevent any uses of the property that would disturb the cap and allow water to seep into the Landfill and spread contamination.

While EPA can recommend that deed restrictions should be established, it does not have the authority to implement them. EPA makes the recommendation to the State and the local municipality that deed restrictions are appropriate. The municipality has the authority to put the deed restriction in place. Deed restrictions that have been established at landfill sites prohibit the installation of drinking water wells in the Landfill and also prohibit any type of construction that would disturb the integrity of the landfill cap.

4. A citizen asked if West Donegal Township is the municipality to which EPA and the State would make a recommendation to establish deed restrictions on the Elizabethtown Landfill property.

EPA Response: Yes.

5. A citizen asked about the ramifications of West Donegal Township ignoring the recommendation to establish deed restrictions and asked if there is a potential for disturbing the cap and spreading contamination without deed restrictions.

EPA Response: Yes, the potential for disturbing the cap and spreading contamination exists if deed restrictions are not established and if the site owners are not interested in protecting the integrity of the cap. Typically, however, the property owner has a considerable financial investment in the site cleanup and is interested in ensuring that the property is properly maintained so that contamination does not spread.

6. A citizen asked about the non-cancer risk from ingesting ground water containing high levels of manganese.

EPA Response: The adverse health effects associated with manganese exposure usually involve impacts to the central nervous system. Chronic exposure to low levels of manganese - that is exposure to low doses over a long period of time - are associated with disorientation and psychosis, and present symptoms that mimic Parkinson's disease. Children seem to be more susceptible than adults to adverse health effects associated with manganese exposure.

7. A citizen asked if there is a risk of adverse health effects associated with manganese exposure from adsorption through the skin.

EPA Response: Manganese is not adsorbed to a great degree through the skin.

B. WRITTEN COMMENTS FROM THE MASONIC HOMES DATED SEPTEMBER 25, 1995; EPA'S RESPONSES

In its comments the Masonic Homes ("MH") expresses concern about the impacts of EPA's preferred remedy on the availability of and quality of ground water beneath its property. Specific concerns are enumerated below.

1. MH asserts that EPA's preferred alternative does not address the potential future installation of drinking water supply wells by MH on the south side (Landfill side) of Conoy Creek.

EPA Response: EPA disagrees with the Masonic Homes' assertion. EPA's risk assessment evaluated the human health risk from ingesting water obtained from wells that could be installed within the plume of contaminated ground water sometime in the future. EPA is requiring a ground water remedial action at the Site due, in part, to this potential future risk. Additionally, the ROD requires that ground water beneath the MH's property be cleaned up to potable levels.

2. MH asserts that EPA's preferred alternative (i.e., extracting and treating contaminated ground water) does not adequately address the long-term impacts to existing MH wells (i.e., diminution of supplies).

EPA Response: The ROD requires that the ground water extraction system shall be designed and operated such that it will have no detrimental effect on existing water supply wells.

3. MH asserts that the interpretations of ground water data that are presented in the RI and FS reports are flawed. MH also avers that EPA has chosen its preferred alternative for remediating the Site based on these flawed interpretations.

EPA Response: EPA has selected the remedy for cleaning up the Site based on the data that are presented in the RI and FS reports and subsequent analytical reports, not on Waste Management's interpretations of the data that are included in the reports. EPA has not accepted any of the interpretations, evaluations, simulations, or projections of the data that Waste Management included in the reports and EPA does not necessarily agree with Waste Management's predictions or conclusions that are based upon its interpretations of the data. 13

13 See Administrative Record, Vol. III, Document 62, EPA's letter to Waste Management regarding EPA's acceptance of Waste Management's RI Report Data, and Administrative Record, Vol. III, Document 63, EPA's letter to Waste Management regarding EPA's conditional approval of the FS Report.

4. MH asserts that the RI and FS reports contain insufficient ground water data to accurately predict the extent of ground water contamination at the Site.

EPA Response: EPA's selected remedy includes the collection of additional ground water data to better define the extent of ground water contamination at the Site. The ROD also requires that the ground water shall be cleaned up throughout the Site - i.e., where ever contamination from the Landfill has come to be located - at or beyond the boundary of the existing Landfill property.

5. MH asserts that its 400 foot well ("EM 400") is contaminated with manganese that is attributable to the Landfill and that water from the well is unusable due to the elevated manganese concentrations. Additionally MH asserts that EPA's base line risk assessment did not adequately assess health risks from manganese in its 400 foot well.

EPA Response: In response to MH comments, EPA has collected additional samples from EM 400 to further evaluate health risks due to contamination. EPA has found that the concentrations of manganese in EM 400 do not exceed EPA's risk based action level of 840 ug/l. (See Data Addendum to EPA's Baseline Risk Assessment dated September 4, 1997, which is contained in the administrative record). Nevertheless, as mandated by CERCLA's ARARs requirement, the ROD does require that an alternate source of drinking water or treatment of MH's water n115 shall be provided to MH should manganese in EM 400 in excess of 50 ug/l be found which is attributable to the Site. EPA also notes that MH's concerns appear to have been addressed by Waste Management's agreement to replace EM 400 with a well producing potable water and a yield equivalent to that of EM400. 14

6. RE: Hot Spots

MH comments that EPA's remedy should include consideration of possible hot spots within the Landfill in design of the treatment system and should consider further evaluation of the burn area within the Landfill for the purpose of source removal.

EPA Response: EPA's ROD requires clean-up of the ground water to potable levels throughout the Site, at or beyond the boundary of the Landfill property. EPA believes that source removal is not warranted.

7. RE: Cattle

MH comments that its cattle have access to Conoy Creek and utilize Conoy Creek as their primary source of drinking water.

EPA Response: The water in Conoy Creek is currently contaminated with hazardous substances attributable to the Landfill. The ROD requires that the waters of Conoy Creek shall be cleaned up to meet Pennsylvania surface water quality standards, 25 Pa. Code Chapters 16 & 93.1 - 93.3. These standards are designed to protect the water uses listed in 25 Pa. Code § 93.4(a), which include livestock water supply.

8. RE: PAH's

MH comments that no coke is stored at MH's power house and that it is unlikely that PAH's detected in Conoy Creek upgradient of the Landfill is attributable to the Masonic Homes.

EPA Response: The comment is noted.

9. RE: Pesticides

MH comments that appendices of the RI Report show that dieldrin was not used by MH in the vicinity of soil sample SS-4.

EPA Response: The comment is noted.

10. RE: NPDES Limits

MH comments that consideration of the influence of upstream industrial discharges is needed in determining the appropriate discharge requirements for the on-site treatment system, which will discharge to Conoy Creek.

14 See Letter Agreement for the Siting, Design, and Installation of a Replacement Water Supply Well(s) dated February 6, 1997, from Waste Management, Inc. to the Masonic Homes; Administrative Record Vol. III.

EPA Response: The comment is noted. Discharge requirements will be determined in accordance with The Clean Water Act, NPDES discharge regulations (40 C.F.R. §§ 122-124).

C. WRITTEN COMMENTS FROM WASTE MANAGEMENT DISPOSAL SERVICES OF PA., DATED SEPTEMBER 14, 1995; EPA'S RESPONSES

1. RE: Design of the Ground Water Extraction System

Waste Management comments that EPA should establish ground water remediation standards for the Site that are consistent with Act 2 and should determine the specific design of the ground water extraction system during the remedial design.

EPA Response: As explained above, see Section IX, Comparative Evaluation of Alternatives, EPA has considered and applied Act 2 remediation standards for the Site remediation as required by CERCLA and the NCP.

EPA agrees that the specific design of the ground water extraction system should be determined during the remedial design. As noted in a letter to Waste Management dated July 12, 1995, concerning the FS prepared by Waste Management, EPA states that it accepts the general description of alternatives presented in the FS Report for the Site however "... Waste Management's inclusion of specific designs for the ground water extraction component of the remedial alternatives is premature.... EPA will consider remedial design submissions as part of the associated work to be performed"...[under the remedial design/remedial action phase of the project]. (Administrative Record Vol. III, Document 77).

2. RE: Liquid GAC and Establishing Discharge Criteria

Waste Management discusses the establishment of remediation standards under Section 301 of Act 2, and comments that EPA should postpone the selection of the on-site treatment train until NPDES discharge criteria are established for Conoy Creek (i.e., during remedial design.)

EPA Response: Waste Management confuses remediation standards for ground water and soil clean-ups (as discussed under Section 301 of Act 2) with NPDES discharge requirements for effluent discharge to surface water bodies (as regulated under the Clean Water Act, 40 C.F.R. 122-124). Under the ROD the discharge limits for the effluent from the on-site treatment plant, which will discharge to Conoy Creek, shall be established in accordance with NPDES requirements (40 C.F.R. 122-124). NPDES requirements are applicable ARARs for the Site. Act 2 is irrelevant to the NPDES discharge limit.

EPA disagrees that the selection of the treatment train should be postponed until the remedial design. Waste Management presents no arguments as to why metals removal and VOC removal would not be required at the Site. These processes are included in the treatment train that is specified in the ROD.

3. RE: Northern Area Cap Upgrade

Waste Management comments that one provision of EPA's preferred alternative - upgrading the northern area of the existing Landfill cap to comply with current Pennsylvania municipal waste landfill final cover standards - is not technically or legally justified.

EPA Response: In response to comment, EPA is not requiring the northern area of the cap to be upgraded. (See Section XII of the ROD - Documentation of Significant Changes). PADEP has determined that the existing northern portion of the cap was designed in accordance with regulations in effect in 1986-1987, the time that the cap was installed (i.e., Title. 25, Pa. Code, Ch. 75) and that the design was approved by PADEP (then PADER) in a letter dated September 10, 1985 from Robert G. Bevin, Bureau of Solid Waste Management, to Mr. Bernard Reider, WMI.

TABLE 1
ELIZABETHTOWN LANDFILL SITE RI/FS RESULTS
CONTAMINANTS DETECTED IN GROUNDWATER IN CONCENTRATIONS EXCEEDING MCLs

Constituents Detected In Groundwater	Maximum Upgradient Concentration (ug/l)	Maximum Downgradient Concentration (ug/l)	Maximum Concentration Greater than ARARs?		ARARs Pennsylvania Safe Drinking Water Regulations	
			Upgradient? (Yes/no)	Downgradient? (Yes/No)	MCLs (ug/l)	MCLGs (ug/l)
INORGANICS						
Barium	401	2960	N	Y	2000	2000
Lead	46.4	44.6	Y	Y	TT(15)	zero
Thallium		4.3	N	Y	2	0.5
VOLATILE ORGANICS						
Benzene		44	N	Y	5	zero
Chlorobenzene	0.8	1200	N	Y	100	100
1,1-Dichloroethene		24	N	Y	7	7
1,2-Dibromo-3-Chloropropane		8	N	Y	0.2	zero
Methylene chloride		9	N	Y	5	zero
Tetrachloroethene	0.7	7	N	Y	5	zero
Trichloroethene		20	N	Y	5	zero
Vinyl Chloride		19	N	Y	2	zero
SEMI-VOLATILE ORGANICS						
bis(2-Ethylhexyl)phthalate	9	9	Y	Y	6	zero

NOTES:

Maximum concentrations were obtained from Appendix S of the revised Final Remedial Investigation Report dated May 1994.

Based upon Pennsylvania Code, Title 25, Chapter 109 dated December 25, 1993, the state has adopted the Federal Drinking Water Standards as State Drinking Water Standards.

Federal Final Drinking Water Standard Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) were obtained from the USEPA Office of Water document "Drinking Water Regulations and Health Advisories", dated May 1994.

A non-zero MCLG value, if different than the respective MCL value, may supercede the MCL as a potential ARAR.

MCLG values of zero are not ARARs; they have been presented on the table for completeness purposes only.

"TT" indicates Treatment Technique. The action level is the numerical value in the parentheses.

A blank under the concentration columns indicates that the analyte was not detected.

TABLE 2
ELIZABETHTOWN LANDFILL SITE RI/FS RESULTS
CONTAMINANTS DETECTED IN SURFACE WATER
IN CONCENTRATIONS EXCEEDING REGULATORY CLEAN-UP LEVELS

Constituents Detected In Surface Water	Maximum Upstream	Maximum Downstream	Maximum Concentration Greater than ARARs?		ARARs		
	Concentration (ug/l)	Concentration (ug/l)	Upstream? (Yes/no)	Downstream? (Yes/No)	Pennsylvania		
					(Surface) Water Quality Standards		
					Human Health (ug/l)	Acute (ug/l)	Chronic (ug/l)
INORGANIC							
Cyanide		10.8	N	Y	700	22	5
Lead		6.7	N	Y	50	124 (b)	4.8 (b)
VOLATILE ORGANICS							
Tetrachloroethene		2	N	Y	0.7	695	139
Methylene chloride		140	N	Y	5	11840	2368
SEMI-VOLATILE ORGANICS							
bis-(2-Ethylhexyl)phthalate	33	52	Y	Y	2	4545	909
2-Chlorophenol		1	N	Y	0.1	560	112
PESTICIDES							
Aldrin		2.7E-04	N	Y	1.0E-04	1.5	0.1
alpha-Chlordane	3.4E-03	2.8E-03	Y *	Y *	5.0E-04 (a)	1.2 (a)	4.3E-03 (a)
gamma-Chlordane	1.1E-03	1.3E-03	Y *	Y *	5.0E-04 (a)	1.2 (a)	4.3E-03 (a)
4,4'-DDD		5.3E-04	N	Y	ND	0.55	1.0E-03
4,4'-DDE	4.3E-03	1.8E-03	Y *	Y *	ND	0.55	1.0E-03
4,4'-DDT	5.6E-03	0.020	Y *	Y *	5.0E-04	0.55	1.0E-03
Dieldrin	5.1E-04	6.9E-03	Y *	Y *	1.0e-04	1.3	1.9E-03
Endrin		9.3E-03	N	Y	0.8	0.09	2.3E-03
Heptachlor	5.8E-04	2.1E-03	Y *	Y *	2.0E-04	0.26	3.8E-03
Heptachlor epoxide	3.6E-03	5.6E-03	Y *	Y *	ND	0.5	0.1

NOTES:

Maximum concentrations were obtained from Appendix T of the Revised Final Remedial Investigation Report dated May 1994.
Pennsylvania Surface Water Quality Standards obtained from Pennsylvania Code Title 25, Chapter 16
and Chapter 93 as published by the Bureau of National Affairs, Inc., 1993.
ND (Not Detectable) indicates that there are insufficient quantitative data to develop a numerical criterion for the cancer risk level.
A blank under the concentration columns indicates that the analyte was not detected.
(a) Criterion is for total isomers.
(b) Criteria is dependent upon hardness. An average value of 138 mg/l for Conoy Creek was used in the calculation of the criteria.
* Apparent pesticide detections are ascribed by SCA/Golder to either off-property anthropogenic non-point sources (surrounding agricultural uses) or
false positive laboratory data (Golder, 1993a).

Table 3 - REVISED
Summary of Cancer and Noncancer Risks by Exposure Route
Future Use Scenario
Groundwater Results Reported by PRPs
Elizabethtown Landfill Site
Lancaster County, Pennsylvania

Exposure Route	6-yr Child Resident		24-yr Adult Resident		30-yr Adult Resident		Lifetime Resident (6-yr + 24-yr)		Chid Trespasser		Adult Worker	
	Cancer	HI	Cancer	HI	Cancer	HI	Cancer	HI	Cancer	HI	Cancer	HI
Inadvertent Ingestion of Soil	NA	NA	NA	NA	NA	NA	NA	NA	2E-07	0.005	2E-07	0.001
Inhalation of Dust	NA	NA	NA	NA	NA	NA	NA	NA	8E-10	NA	2E-09	NA
Ingestion of Groundwater	4E-04	295	7E-04	126	8E-04	126	1E-03	421	NA	NA	3E-04	45
Dermal Absorption of Groundwater	8E-06	1.0	NA	NA	NA	NA	8E-06	1.0	NA	NA	NA	NA
Inhalation of Vapors	NA	NA	1E-04	6	2E-04	6	1E-04	6.0	NA	NA	1E-04	4
Inadvertent Ingestion of Surface Water	3E-09	0.02	6E-09	0.01	NA	NA	9E-09	0.03	NA	NA	NA	NA
Dermal Absorption of Surface Water	1E-09	0.002	6E-09	0.001	NA	NA	7E-09	0.003	NA	NA	NA	NA
Inadvertent Ingestion of Sediment	NA	0.001	NA	0.0002	NA	NA	NA	0.001	NA	NA	NA	NA
Dermal Absorption of Sediment	NA	0.001	NA	0.001	NA	NA	NA	0.002	NA	NA	NA	NA
Total Future Risk	4E-04	296	8E-04	132	1E-03	132	1E-03	426	2E-07	0.005	4E-04	49

Underlined values represent revisions. In comparison to original Baseline Risk Assessment.

APPENDIX I

LOCATIONS OF DRINKING WATER WELLS REQUIRING QUARTERLY MONITORING

Well #	Street Address	Current Resident
D60	227 Rear Maytown Road Elizabethtown, PA 17022	D. Espenshade
D62	1096 West Bainbridge Rd. Elizabethtown, PA 17022	R. Delaney
D63	1098 West Bainbridge Rd. Elizabethtown, PA 17022	K. Smitley
D64	840 West Bainbridge Rd. Elizabethtown, PA 17022	L. Mullen
D65	820 West Bainbridge Rd. Elizabethtown, PA 17022	R. Swanger
M400*	Masonic Homes One Masonic Drive Elizabethtown, PA 17022	Masonic Homes
M500	Masonic Homes One Masonic Drive Elizabethtown, PA 17022	Masonic Homes

NOTES

* Well M400 and any replacement wells for M400 shall be included in the monitoring

APPENDIX II
CLEAN UP LEVELS FOR GROUNDWATER

Chemical	Required Concentration (ug/l)	Basis
	5	MCL
Benzene		
Chlorobenzene	100	MCL
1,1-Dichloroethene	7	MCL
1,2-Dibromo-3- chloropropane	0.2	MCL
Methylene chloride	5	MCL
Tetrachloroethene	5	MCL
Trichloroethene	5	MCL
Vinyl chloride	2	MCL
Bis(2-ethylhexyl)phthalate	6	MCL
Bis(2-chloroethyl)ether	0.0092	Risk Based (a)
Arsenic	50	MCL
Barium	2000	MCL
Lead	5	State Standard (b)
Manganese	50*	MCL (c)
Thallium	0.5**	MCLG

Notes

(a) Risk-based levels are calculate assuming ingestion of 2 liters/days, 365 days/year, for 70 years by a 70 kg individual.

(b) State standard adopted under Pa. Act 2.

(c) State standard adopted under Pennsylvania's Safe Drinking Water Act and The Land Recycling and Environmental Remediation Standards Act.

* 50 ug/l or to background concentration of manganese.

**0.5 ug/l or to background concentration of thallium.

APPENDIX III
ELIZABETHTOWN LANDFILL SITE
CLEAN-UP LEVELS FOR SURFACE WATER

Chemical Name	Required Concentration (ug/l)	Basis*
Cyanide	5	PASWQS
Lead	4.8	PASWQS
Chlorobenzene	20	PASWQS
Tetrachloroethene	0.7	PASWQS
Methylene chloride	5.0	PASWQS
bis-(2-chloroethyl)ether	0.03	PASWQS
bis-((2-Ethylhexyl)phthalate	2**	PASWQS
2-Chlorophenol	0.1	PASWQS
Aldrin	1.0E-04	PASWQS
Endrin	2.3E-03	PASWQS

NOTES

* PASWQS - Pennsylvania Surface Water Quality Standards,
Obtained from Pennsylvania Code Title 25, Chapter 16

**2 ug/l or to background concentration

Appendix IV

Applicable or Relevant and Appropriate Requirements Elizabethtown Landfill Site

Ground Water

Federal:

Requirement: Safe Drinking Water Act, 42 U.S.C. §§ 300(f) - 300(j)-26, including Maximum Contaminant Levels set under 40 C.F.R. Part 141

Description: Federal statute and regulations which set enforceable Maximum Contaminant Levels ("MCLs") for drinking water provided by public water supplies.

State:

Requirement: Safe Drinking Water Act, Act of May 1, 1984 (P.L. 206, No. 43), 35 P.S. § 721 et. seq.; Water Supply and Community Health Regulations, 25 Pa. Code § 109 et. seq.

Description: State statute and regulations which set enforceable drinking water standards to protect public drinking water systems.

Requirement: The Land Recycling and Environmental Remediation Standards Act, Act of July 18, 1995 (P.L. 4, No. 1995 - 2), 35 P.S. § 6026.101 et. seq.; 25 Pa. Code Ch. 250 (Administration of Land Recycling Program).

Description: State statute and regulations which establish the standards for environmental remediations conducted under certain Pennsylvania environmental statutes.

Requirement: Solid Waste Management Act, Act of July 7, 1980 (P.L. 380, No. 97), as amended; 35 P.S. § 6018-101 et. seq.; 25 Pa. Code Ch. 273 (Municipal Waste Management Regulations).

Description: Establishes requirement that municipal waste landfills monitor ground water for potential leachate constituents. (See also Cap requirements.)

Requirement: The Water Well Drillers License Act, Act of May 29, 1956 (P.L. 1840, 32), P.S. § 645.1 et. seq.; 25 Pa. Code Ch. 107.

Description: Requirements for water well drillers.

Requirement: The Hazardous Waste Management Regulations, 25 Pa. Code Chs. 260 - 270.

Description: Requirements addressing the generation and management of well drillings, well water and/or other investigation-derived wastes containing hazardous substances to the extent they are deemed "hazardous wastes." These regulations specifically cover the management of spent carbon and other water treatment wastes that fail the Toxicity Characteristic Leaching Procedure ("TCLP"). The remedy to be implemented will comply with the applicable requirements of 25 PA Code Ch. 262.11 (relating to hazardous waste determination and if hazardous waste from equipment decontamination or debris, etc., is stored on-Site pending off-Site disposal, all applicable storage requirements shall be met.

Requirement: The Residual Waste Management Regulations, 25 Pa. Code Chs. 281 - 299.

Description: Regulation pertaining to the generation, handling and management of residual wastes, which may include investigation-derived wastes and treatment residuals determined to be non-hazardous. These regulations govern residual waste processing, disposal, transportation, collection and storage.

Requirement: Pennsylvania Department of Transportation Act, Act of June 1, 1945, (P.L. 1242, No. 421), 36 P.S. §§ 670 - 411, 670 - 420 and 670 - 702; the Pennsylvania Hazardous Transportation Regulations, Pa. Code Ch. 13 & 15.

Description: This act and accompanying regulations set the standards for the

transportation of hazardous materials.

Surface Water

Federal:

Requirement: Aquatic Water Quality Criterion ("AWQCs") established under Clean Water Act, 33 U.S.C. §§ 1314 or 1315

Description: To the extent that the state has not established numerical AWQC, federal AWQC which are otherwise nonenforceable are relevant and appropriate. See also Section 121(d)(2)(A) of CERCLA, 42 U.S.C. § 96121(d)(2)(A).

Requirement: Safe Drinking Water Act, 42 U.S.C. §§ 300(f) - 300(j)-26, including Maximum Contaminant Levels set under 40 C.F.R. Part 141

Description: Federal statute and regulations which set enforceable Maximum Contaminant Levels ("MCLs") for drinking water from public water supplies.

State:

Requirement: The Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. § 691.1 et. seq.; 25 Pa. Code § 92.31 (implementing requirements of Section 402 of the federal Clean Water Act, 33 U.S.C. § 1342, and its National Pollutant Discharge Elimination System ("NPDES") regulations, 40 CFR §§ 122.41 - 122.50).

Description: State requirements set forth to protect and ensure the integrity of streams; implementing federal NPDES permitting program.

Requirement: Water Quality Standards, 25 Pa. Code Ch. 93.1-93.9.

Description: Establishes general and specific water quality standards to ensure quality of waters, includes designated water use protection for each stream in Pennsylvania in part based on its protected uses. (All of the cleanup levels for surface water under the Elizabethtown ROD were set to meet Pennsylvania's Water Quality Criteria Standards. See Appendix II.)

Requirement: Water Quality Toxics Management, 25 Pa. Code Ch. 16; Water Quality Standards, 25 Pa. Code Ch. 93.1-93.9.

Description: Establishes in-stream water concentrations for toxic substances that are to be used in the development of effluent limits.

Requirement: Wastewater Treatment Requirements, 25 Pa. Code. 95.1 et. seq.,.

Description: Sets forth waste treatment requirements for treatment process dischargers, including general requirements for discharges into "high quality waters" and "exceptional value waters," and the procedures for dealing with site-specific circumstances.

Requirement: Special Water Pollution Regulations, 25 Pa. Code Ch. 101.

Description: Requires that PADEP be notified of an accident or incident involving any toxic substance that would endanger downstream water users, or result in a danger of pollution or damage to property. Includes requirements for response action.

Air Emissions

Federal:

Requirement: Clean Air Act, 42 U.S.C. § 7401 et. seq.; National Emissions Standards for Hazardous Air Pollutants ("NESHAPs"), 40 C.F.R. 61.64(b)

Description: Restricts emissions of certain hazardous air emissions, including benzene. (Additionally, Pennsylvania's substantive Air Resources Regulations below are federally enforceable to the extent they are incorporated into the Commonwealth's approved State Implementation Plan under the Clean Air Act).

State:

The Air Pollution Control Act, Act of January 8, 1960 (PL. 2119), 35 P.S. § 4001, et. seq.; substantive Air Resources Regulations, 25 Pa. Code Chs. 121 - 143, including specifically the following regulations:

Requirement: PA Code Title 25 Ch. 127.12(a)(5).

Description: Regulates the construction, modification, reactivation, and operation of air emission sources (including air stripper, Landfill gas vents), requires that Best Available Technology ("BAT") be met, construction plans be approved, and that special requirements be met in non-attainment areas.

Regulation: PA Code Title 25 Ch. 123.1, 123.2

Description: Regulates fugitive emissions, sets specific limitations for particulate matter, odor, and visible emissions (which might be created during construction or other Site-related activities).

Landfill Cap

Requirement: Solid Waste Management Act, Act of July 7, 1980 (P.L. 380, No. 97), as amended; 35 P.S. § 6018.101 et. seq.; 25 Pa. Code Ch. 273 (Municipal Waste Management Regulations).

Description: Sets requirements for construction, operation and maintenance of municipal waste landfills and landfill systems.

Requirement: The Storm Water Management Act, Act of October 4, 1978, (P.L. 864, No. 167), as amended, 32 P.S. §§ 680.1 - 680.17; 25 Pa. Code Ch. 102 - Erosion Control, Sections 102.2 - 102.24 - Erosion & Sedimentation Control, and Sections 102.31 - 102.41 - Permits and Plans

Description: This act and the accompanying regulations apply generally to all site activities which impact on storm water management and erosion control, and specifically requires those undertaking earth-moving activities which create accelerated erosion or a danger of accelerated erosion, implement certain soil erosion control and conservation measures.

Appendix V

To Be Considered Documents Elizabethtown Landfill Site

PADEP Groundwater Monitoring Guidance Manual, February 29, 1996. The manual provides guidance for implementing a comprehensive monitoring program consistent with established principles and objectives for protection of the Commonwealth's ground water resources.

Pennsylvania's Lands Recycling Technical Manual.

"Soil Erosion and Sedimentation Control Manual". The manual covers storm water management and erosion control during construction activities.

OWSER Directive # 9355.0-28, Control of Air Emissions from Superfund Air Strippers at Superfund Ground Water Sites.

APPENDIX VI
ACTION LEVELS FOR DRINKING WATER

Chemical	Required Concentration (ug/l)	Basis
Benzene	5	MCL
Chlorobenzene	100	MCL
1,1-Dichloroethene	7	MCL
1,2-Dibromo-3-chloropropane	0.2	MCL
Methylene chloride	5	MCL
Tetrachloroethene	5	MCL
Trichloroethene	5	MCL
Vinyl chloride	2	MCL
Bis(2-ethylhexyl)phthalate	6	MCL
Bis(2-chloroethyl)ether	0.0092	Risk Based (a)
Arsenic	50	MCL
Barium	2000	MCL
Lead	15	Action Level (b)
Manganese	50	MCL (c)
Thallium	2	MCL

Notes

(a) Risk-based levels are calculated assuming ingestion of 2 liters/days, 365 days/year, for 70 years by a 70 kg individual.

(b) Action level under Federal Safe Drinking Water Act.

(c) State standard adopted under Pennsylvania's Safe Drinking Water Act and The Land Recycling and Environmental Remediation Standards Act.

