134327

APPENDIX A
Record of Decision for the Welsh Road Superfund Site.
Operable Unit Number 1

RECORD OF DECISION

WALSH LANDFILL SUPERFUND SITE
(a.k.a. Welsh Road/Barkman Landfill Site)

DECLARATION

SITE NAME AND LOCATION

Walsh Landfill Site (a.k.a. Welsh Road/Barkman Landfill Site)
Chester County, Pennsylvania.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Remedial Action selected for the first operable unit at the Walsh Landfill Site. This action provides for an alternate water supply and landfill cap to address the primary risks posed by the site conditions. This document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA); and, to the extent practicable, the National Contingency Plan (NCP), 40 CFR Part 300. The decisions contained herein are based on information contained in the administrative record for this Site. A second Record of Decision (ROD) will be prepared following the completion of the focused ground water and feasibility study, and will address the contaminated ground water aquifer at the site.

The Commonwealth of Pennsylvania has concurred with the selection of this remedy.

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE REMEDY

EPA has selected, and the Commonwealth of Pennsylvania has concurred on, the following Remedial Action for the first operable unit at the Walsh Landfill Site. The remedial action for this operable unit includes a final source control action for the landfill and an alternate water supply. The second operable unit will address the contaminated ground water aquifer. The major components of the Selected Remedial Action for the first operable unit are as follows:

Selected Remedial Action: Alternative 4

* Construction of new water service lines, mains, hydrants, and valves, and the connection to the Honey Brook Borough Water Authority's water supply mains. It is estimated that 50 residences will be provided with this service, based on previous sampling results, and the number of residents currently receiving bottled water. The number and location of residences which will receive public water will be verified during the design of this remedial action.

* Approximately 6500 feet of 8-inch water main, 7500 feet of 4-inch and 3000 feet of 2-inch distribution lines will be installed along PA State Route 10 and Welsh Road. Service lines will be installed for each of the 50 households.

* The current water supply system will be upgraded to provide sufficient capacity to service the impacted residences. One water supply well will be installed and connected to the Honey Brook Borough water supply system. A booster pump and 120,000-gallon water storage tank will also be required to service the residents.

* Control of the new water lines and services will be transferred to the Honey Brook Borough Water Authority as soon as construction is completed.

* Resource recovery activities will be completed to remove the bulky items and debris from the surface of the landfill in order to prepare for construction of a landfill cap. Additional information will be collected on the composition of the landfill

materials during the design of a landfill cap. At a minimum, a multi-media landfill cap that meets the requirements of the Pennsylvania Municipal Solid Waste Regulations will be constructed at the site. The cap will consist of a topsoil component underlain by a soil layer, a drainage layer with a permeability greater than a 1×10^{-3} cm/sec., a high-density polyethylene geomembrane, and a base soil layer over the landfill. The cap will be designed to cover an area of at least 5.2 acres, and will be vegetated and sloped in accordance with the State regulations. Surface water control measures will be incorporated into the design of the landfill cap.

* Institutional controls including the construction of a six-foot high fence topped with barbed or razor wire around the perimeter of the landfill, and modification of the property deeds for the landfill will be completed to restrict unauthorized use or access to the site, and to restrict future use and property development.

STATUTORY DETERMINATIONS

The Selected Remedial Action (Alternative 4) is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. Connection to the public water supply and capping the landfill is an effective remedy that will prevent human exposure to the contaminated media which are posing the primary risks at the site: ground water and soils. This remedy utilizes permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable for this site. However, because treatment of the principal threats at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element.

Because this remedy will leave hazardous substances on-site, a 5-year review under Section 121(c) of CERCLA, 42 U.S.C. 9621(c), will be conducted for the Site to ensure that the remedy continues to provide adequate protection of human health and the environment.

Edwin B. Erickson
Regional Administrator

6/29/92
Date

I. SITE NAME, LOCATION AND DESCRIPTION

The Walsh Landfill Site is located on approximately seven acres, near the top of Welsh Mountain in Honeybrook Township, Chester County, Pennsylvania (Figure 1-1). Approximately five-sixths of the property area lies south of the Honeybrook Township, Chester County line, while the remainder is located in Caernarvon Township, Lancaster County. The entrance to the site borders on Welsh Road, 200 feet east of the intersection of Welsh Road with PA Route 10. The area surrounding the landfill is heavily wooded, with agricultural activity situated approximately one-half mile south of the site. Approximately 49 homes or residential structures are situated within a half-mile radius north, east, and west of the landfill. Several residents live in house trailers that are situated within five to ten feet of the current salvage operation.

A salvage operation and waste transfer station are currently operating on top of, and in the area surrounding the landfill. The original landfill area covered approximately 1.5 acres on the southern portion of the site. A large garage and mobile office trailer are currently located near the main entrance to the landfill, along Welsh Road. The surface of the landfill is covered with assorted vehicles, dumpsters, appliances, tires, batteries, empty underground storage tanks and drums, construction waste and other debris. The southeastern portion of the landfill was formerly used as a burn area, and currently two patches of dead trees, and sparse vegetation exist along the southern border. A stone/gravel access road exists along the western and southern borders of the landfill property. A fifty-foot power line/utility right-of-way also lies along the southern border of the property. Areas to the north, east, and west are woodlands interspersed with houses constructed on cleared lots.

The Walsh Landfill was constructed as a side-hill facility in which the landfill materials were placed directly on the existing ground surface near the ridge line of Welsh Mountain. The axis of Welsh Mountain extends northeast to southwest, with the mountain being the dominant topographic feature of the site area. Surface runoff from the landfill generally flows to the south and southeast. Several spring-fed ponds in the Walsh Landfill study area are situated to the south of the landfill, and are drained by streams running south and southeast. These streams drain into the West Branch of Brandywine Creek, which eventually flows into the Delaware River.

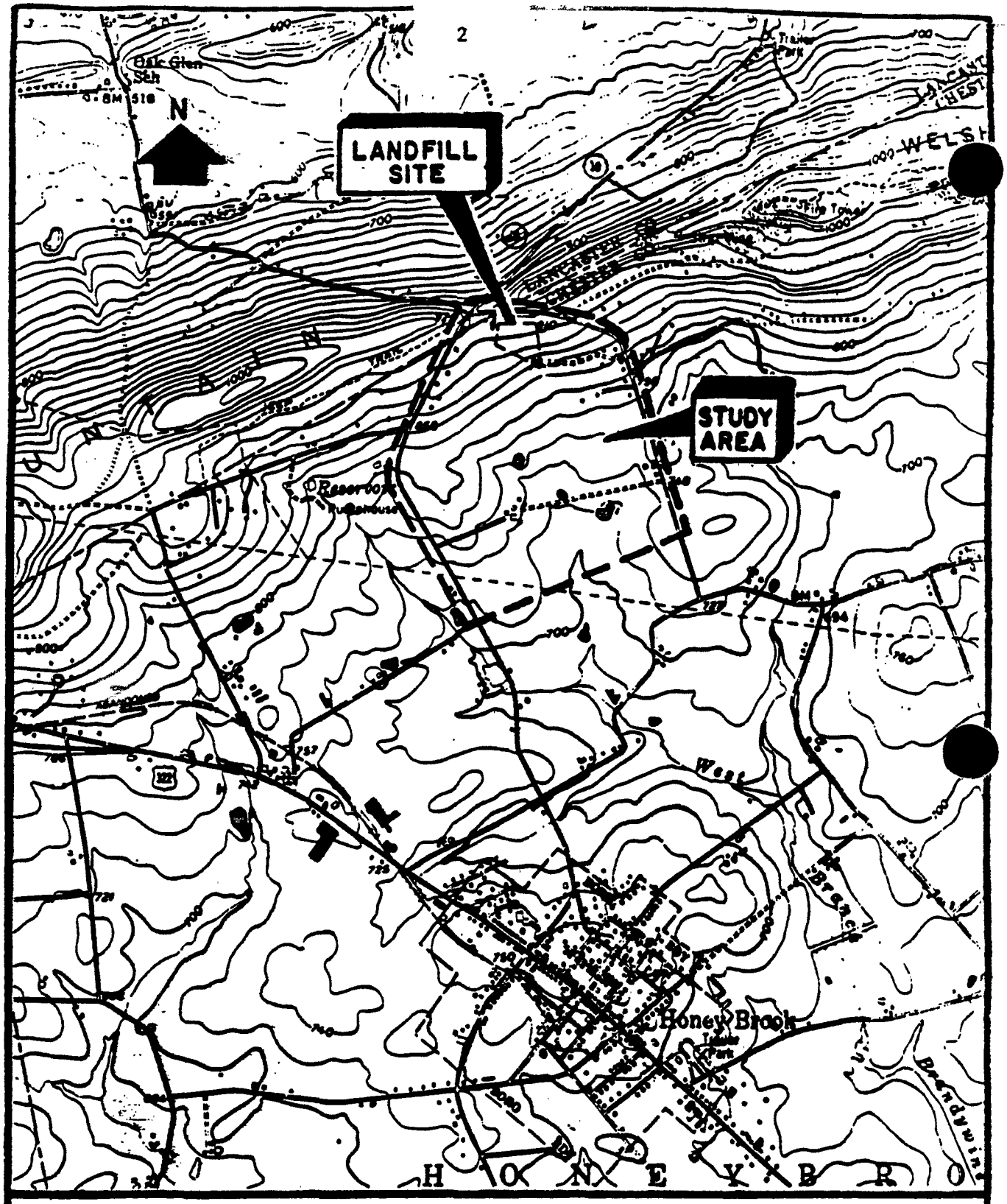

FIGURE 1-1
WELSH ROAD/ BARKMAN LANDFILL SITE
PROJECT LOCATION MAP

SOURCES: HONEYBROOK, PA. U.S.G.S. 7.5 TOPOGRAPHIC MAP, 1955, REV. 1983
MORGANTOWN, PA. U.S.G.S. 7.5 TOPOGRAPHIC MAP, 1956, REV. 1980

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Walsh Landfill Site reportedly received mixed municipal and industrial wastes for disposal between 1963 and 1976. The site consists of several land parcels, bought at different times by Grace and Ernest Barkman. Mr. Barkman operated a trash hauling business, "Ernest Barkman's Trash Disposal," and a landfill on the property during this period. From 1970 up through the time of the reported landfill closure in 1976, Mr. Barkman made several attempts to obtain State and Township approval for a landfill at this location. Due to citizen complaints regarding the site activities and continued non-compliance with municipal solid waste regulations, as noted by several inspections by State, county, and township officials, Mr. Barkman's operation was never permitted.

Site inspections conducted by the Chester County Health Department in 1970 described evidence of burning automotive materials and rebuilding of a sewage collection truck on the site. The Pennsylvania Department of Environmental Resources (PADER) inspected the site various times from 1971 through 1974 and issued several fines to Mr. Barkman for unacceptable landfill practices and violation of the Pennsylvania Solid Waste Management Act. On July 31, 1973, criminal charges were filed against Mr. Barkman by PADER, with respect to the unlawful operation of a waste facility without a permit and for burning of solid waste at the site. Subsequent inspections of the site by PADER in 1974 noted several continuing violations in the landfill's operation. In addition, a formal objection was raised by Honeybrook Township regarding the landfill's location in an area zoned as farm-residence.

In January 1976, PADER noted that the landfill was approaching capacity, and requested that Mr. Barkman submit a final closure plan for the landfill in place of a permit application for continued operation. PADER modified the closure plan submitted by Mr. Barkman and approved it in December 1976. PADER continued to inspect the site to monitor the closure activities. The State inspection reports note several violations of the Pennsylvania Solid Waste Management Act and little progress with landfill closure.

In the summer of 1979, PADER received complaints from local citizens regarding the dumping of suspected hazardous materials at the site. The State investigated this complaint and visited

the site on July 7, 1979 to find that waste disposal activities had resumed. Numerous drums were found on the site with labels describing their contents and source as sludge residue from roofing tars and Calcozine from Sunoco Products in Downingtown, PA. PADER also observed evidence of leakage from 20 full 55-gallon drums onto an adjacent residential property. Information obtained from the drum labels described the contents and source as Ridoline 442 (corrosive) and various acids from Penguin Industries in Coatesville, PA.

In conjunction with the above findings, PADER received a complaint that fumes emanating from the drums had sickened local residents. The State and Chester County Health Department proceeded to sample private wells in the area and found elevated levels of organic and inorganic compounds. Also, in accordance with the landfill closure plan, four onsite monitoring wells were installed, sampled, and found to contain organic and inorganic contamination. PADER and Chester County continued to receive citizen complaints during 1980 and 1981 regarding noticeable odors and a foul taste of their well water, and sampling results continued to show elevated levels of contaminants in the wells. During a March 1981 site inspection, 15 to 20 full 55-gallon drums were noted onsite, and open burning of other material was occurring. The State advised Mr. Barkman of proper handling procedures, but a follow-up inspection in May 1981 showed the drums remained onsite.

On September 2, 1982, a 60-day notice of intent to file a citizen suit in accordance with the Pennsylvania Clean Streams Law was issued to Mr. Barkman for improper operation, maintenance, and construction of a landfill which rendered water in nearby wells unfit for consumption. In February 1983, Mr. Barkman's consultant, Nassaux-Hemsley, Incorporated, proposed that the dumping of liquids used to clean out dairy tanks at three sites in close proximity to the landfill were partially responsible for the ground water contamination.

In April 1983, a fuel oil spill occurred at the site when a heating oil tanker leaked and oil pooled on the landfill surface. EPA and PADER's files indicate that twelve drums of fuel oil were collected by Mr. Barkman and shipped to what Mr. Barkman termed his "other location," and 25 cubic yards of soil were removed and taken to Lanchester Landfill for disposal. In addition, one full 55-gallon drum, labelled "ARCO Polymers, D-3, SHEREX Chemical Company, Dublin, Ohio" was found on the landfill.

In December 1983, DER prepared a draft order to be issued to Mr. Barkman for voluntary closure of the landfill and the elimination of soil and ground water pollution by May 1984. This draft order was never finalized due to the placement of the site on EPA's National Priorities List in September 1984.

Prior to the NPL listing, in June 1984, EPA sampled several 55-gallon drums found on Mr. Barkman's landfill. The drums contained various hazardous substances including: toluene, ethylbenzene, 1,1-dichloropropane, chlorobenzene and methylene chloride. EPA issued a unilateral order to Mr. Barkman on February 22, 1985, directing him to complete the containment and removal of these drums to a permitted disposal facility. Mr. Barkman initially agreed to complete this work, but later proved uncooperative, and EPA completed the work using Federal funds.

In 1985, PADER became the lead agency for the Walsh Landfill Site, and entered into a cooperative agreement with EPA to conduct a Remedial Investigation and Feasibility Study (RI/FS). The site was classified as a state-lead Superfund site, and PADER proceeded to hire a contractor, SMC Martin, to perform the required site investigation work.

In the fall of 1985, EPA issued correspondence requesting information from five companies whose labelled drums had been found on the site. The five companies included: Penquin Industries, Inc. of Coatesville, PA; Schick Electric, Inc. of Lancaster, PA; Sperry New Holland of New Holland, PA; Sonoco Products of Downingtown, PA; and, Sherex Chemical Company of Dublin, Ohio. EPA received responses from these companies indicating that they had no information and/or knowledge regarding the disposal of hazardous materials or drummed wastes at the Walsh Landfill Site. Thus Mr. Barkman, the site owner was the only responsible party who received a notice letter for the RI/FS work; Mr. Barkman received notice from PADER in January 1985 and April 1986, and from EPA on May 31, 1989. Mr. Barkman did not volunteer to complete or fund the required work for the site.

The RI field studies were initiated in 1987 and the final RI report was submitted by PADER's consultant in 1988. PADER conducted several rounds of residential well sampling in 1987, 1988, and 1989. Based on the results of this sampling, PADER

issued an advisory to local residents in March 1989 and began supplying bottled water to 44 residential units, or structures. The provision of bottled water constituted an interim remedial measure, and the action was taken in order to be protective of public health. Low levels of primarily organic contaminants were detected at random intervals and various well locations among the 49 residential structures in the Site area. In addition, little documented information was available on the health effects of exposure to the detected contaminants. Due to these uncertainties, the provision of bottled water was selected as a protective measure for the residents who use ground water as their domestic water supply.

The Site is currently operated as a solid waste transfer station and salvage yard. Access to the Site is unsecured, and the continuing operations are contributing to the increased volume of landfill/junkyard debris, and the overall size of the Site.

III. COMMUNITY PARTICIPATION

In accordance with Sections 113(k)(2) and 117 of CERCLA, on March 18, 1990, EPA placed a quarter page advertisement in the West Chester Daily Local and the Lancaster New Era, announcing the 30-day comment period on the Proposed Plan for the first operable unit of the Walsh Landfill Site. Also announced was the availability of the Proposed Plan, RI/FS, and Public Health Evaluation reports, as part of the Administrative Record in the site information repository: Honey Brook Public Library.

The public comment period began March 18, 1990, and ended May 18, 1990. EPA received a timely request for an extension of the comment period, and thus granted the minimum 30-day extension, in accordance with the revised provisions of the NCP.

A public meeting was conducted on March 27, 1990 in order to facilitate receiving the public's comments and concerns with the proposed action for the first operable unit at the site. The local citizens who attended the meeting appeared to generally agree with the proposed remedial action for the contaminated drinking water supply and the landfill. Specific comments and concerns raised by the local community are addressed in the Responsiveness Summary.

IV. SCOPE AND ROLE OF OPERABLE UNIT

The Walsh Landfill Site has been divided into two operable units (OUs), or site components, in order to effectively address the complex contamination problems present in the various environmental media. The institutional and containment actions included in the remedy for the first OU will address the principal threats to human health posed by the presence of elevated levels of organic and inorganic contaminants in private wells and landfill soils. OU number one allows for expedited action on the contaminated drinking water supply and final source control action for the landfill. OU number two will consist of the remedy selection for contaminated ground water. This approach to remediation will allow for expedited action to address health threats while further study of ground water clean-up alternatives is completed.

The remedy for OU number one removes the threats to public health posed by the ingestion and/or inhalation of contaminated ground water by extending a municipal water line to service the affected residents in the area of the site. The remedy also addresses the threats to public health posed by the ingestion of, inhalation of, and dermal contact with contaminated landfill soils by placing a cap over the landfill and fencing the area. The landfill cap will address the threat to the environment by substantially reducing the amount of percolation through the landfill, and thus the amount of leachate entering the ground water.

The remedial action for the first operable unit also will address the local community's concerns with Mr. Barkman's current operations. The local citizens are concerned with the open burning practices and miscellaneous waste handling activities that are reported to occur at the site, and any health or environmental risks that these may pose. Capping the landfill will necessitate ceasing the current operations on Mr. Barkman's property, and will require the removal and decontamination of the salvage materials and waste products currently placed on the site.

The remedial actions included in the first OU will address the primary human health threats posed by Site conditions. The remedy for the first OU will allow for the primary health risks to be addressed while the investigation required for the

second OU, the contaminated ground water aquifer, proceeds. A limited study of the site's ground water flow dynamics and chemical characteristics will be completed in order to develop information on effective cleanup remedies for the aquifer, as the second OU for the site.

V. SUMMARY OF SITE CHARACTERISTICS

Environmental Setting and Climate

Chester and Lancaster Counties, which encompass the Walsh Landfill Site, are located in Southeastern Pennsylvania. This area lies within the Piedmont physiographic province of the Appalachian Highlands. The province is bounded on the west by the Blue Ridge province, and to the east by the Coastal Plain. The topography of the site is dominated by Welsh Mountain, which extends northeast to southwest.

The climate in the area is mild, humid, with well-defined seasons. Temperatures are usually moderate. Precipitation is generally ample and dependable, with the greatest amount falling during summer months. The prevalent wind direction is from the west with an average speed of 9.5 miles per hour.

1. Regional Geology

Bedrock underlying the Walsh Landfill Site is characterized by two distinct, highly fractured geologic units. The oldest of these is a Precambrian-aged amphibolite and granulite facies felsic gneiss and graphite-bearing felsic gneiss. This unit is located just to the south of the landfill.

The second unit is the Hellam Conglomerate member of the Cambrian Chickies Quartzite Formation. This unit, which forms the ridge-cap of Welsh Mountain, is located directly beneath the landfill and consists of a fractured, white, tan or gray to blue-gray conglomerate with occasional interbedded green, fine-grained quartzite, occasional iron staining, and occasional thin shaley layers.

The contact between the Precambrian gneiss and the Cambrian quartzite is characterized by a heavily fractured and weathered zone approximately three feet in thickness. The Cambrian-

Precambrian contact is located approximately 300 to 350 feet south of the southern border of the landfill and strikes N69 degrees E. The dip of the contact is believed to be between 40 degrees and 53 degrees to the northwest.

The bedrock is generally overlain by saprolite. Saprolite is defined as a soft, variably to thoroughly decomposed rock formed in place by chemical weathering of igneous or metamorphic rocks. Both the Precambrian gneiss and the Chickies quartzite have associated saprolite layers. This overburden material ranges in thickness from approximately 10 to 40 feet beneath the Walsh Landfill to over 90 feet in the vicinity of the Cambrian - Precambrian contact.

2. Hydrogeology

Ground water in the vicinity of the Walsh Landfill Site occurs in a fractured bedrock aquifer under confined to semi-confined conditions. The ground water in the landfill area is encountered in the quartzitic and gneissic bedrock and in the saprolitic overburden. Both of these systems apparently are interconnected and are flowing in a general south-southeasterly direction following the surface topography. The bedrock is a fractured medium and, therefore, ground water migrates mostly along avenues of secondary porosity, such as interconnected bedrock fractures. Ground water flow through the interconnected fractures can be rapid compared to that in the surrounding bedrock material, and the direction locally may vary substantially from the average gradient.

Ground water flow is controlled by the geometry, orientation, and interconnections within the bedrock fractures. These properties are quite variable, and thus a complex flow field has developed at the site. In general, the ground water appears to be flowing from the northwest to the southeast. However, due to the fractured nature of the bedrock, and induced stresses on the aquifer due to the pumping of residential wells, the actual direction of ground water flow may vary a great deal from the direction of the average gradient. These variations may induce local ground water flow and contaminant migration to occur in any direction. Contaminant migration will also be influenced by dispersive processes acting within the aquifer.

The fractured bedrock aquifer currently is the primary source of water in the site vicinity; most residents use ground water as a source of potable water for their homes and farms.

Due to the detection of organic contaminants in several residential wells in the area, PADER initially provided bottled drinking water to 44 residential structures beginning in March 1989. The number of residential structures receiving bottled water has varied over the past two years. The primary reasons for such variation have been independent sampling completed by residents, and families moving in and out of the area. Many residents continue to use ground water for other activities such as bathing and washing.

3. Hydrology

Soils in the site area are generally the silt loams typical of the Neshaminy-Glenelg and Edgemont Associations. The soils at the site are a mixture of native soils, demolition and construction debris, and various plastics, paper, and metal debris. The landfill area drains south and southeast by surface runoff. Several spring-fed ponds situated to the south of the landfill are drained by streams running south and southeast. The surface water from the landfill drains into the West Branch of Brandywine Creek, which flows into the Delaware River.

VI. NATURE AND EXTENT OF CONTAMINATION

The primary risks attributed to the previous disposal practices at the Walsh Landfill Site are the degradation of the ground water quality (specifically, the potable drinking water supply), and soils contamination. Surface soils and sediments at the site have elevated levels of polynuclear aromatic hydrocarbons (PAHs) and metals including arsenic, cadmium, lead and nickel. The ground water system, including the potable water supply, contains volatile organic contaminants including 1,1-dichloroethane, chloroform, benzene, trichloroethylene, tetrachloroethylene, and the metals arsenic, cadmium, lead and mercury.

All sampling completed during the field studies indicated the landfill as the source of contamination. No sampling of the landfill materials was completed to characterize the composition of the waste materials in the landfill, or to identify zones or pockets of concentrated contamination. The data identifies localized areas of soil contamination, and sporadic occasions of ground water contamination offering no clearly defined or predictable contaminant plume.

The routes of exposure to the contaminants present at the site include: ingestion and inhalation of ground water; and ingestion of, inhalation of, and dermal contact with landfill soils by local residents and landfill workers. At present, 44 residential structures are receiving bottled drinking water from PADER. These residents continue to use ground water for bathing and washing, and thus remain at risk from inhalation of volatiles in their homes.

The ongoing activities at the landfill involve heavy vehicle traffic during the solid waste transfer and salvage operations. This activity may pose a potential risk to local residents by generating dust from the landfill soils and sediments, and creating a possible mechanism for an airborne release of contaminants. In addition, the unsecured status of the southern, eastern and western edges of the landfill/junkyard may allow local residents to come into direct contact with the inorganic contaminants and PAHs detected in landfill soils. Access to the site may also pose a general safety hazard to local residents due to the placement of various unstable piles of salvage materials, vehicles, and construction debris on the sloped areas around the site perimeter.

A. Remedial Investigation (RI)

The RI field activities and analytical program were designed to define the extent of environmental contamination from the landfill, to identify migration pathways, and to provide data to support a feasibility study of potential remedial actions. In 1985, PADER retained the services of SMC Martin Incorporated, of Valley Forge, PA to conduct the RI/FS for the Walsh Landfill Site.

The scope of SMC Martin's RI included: surface water and sediment sampling, surface and subsurface soil sampling; monitoring well construction, testing, and sampling; residential well sampling; limited air quality sampling, and preparation of a report summarizing the results of the field and analytical program.

The following figures are provided to illustrate the scope of the field program:

Figure 1 - Surface Soil Sampling Locations;
Figure 2 - Surface Water & Sediment Sampling Locations;
Figure 3 - Monitoring Wells/Sampling Locations; and
Figure 4 - Residential Wells/Sampling Locations.

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WELSH ROAD/BARKMAN LANDFILL SITE
COMPOSITE SURFACE SOIL SAMPLING LOCATION
MODIFIED FROM SMC (1988)

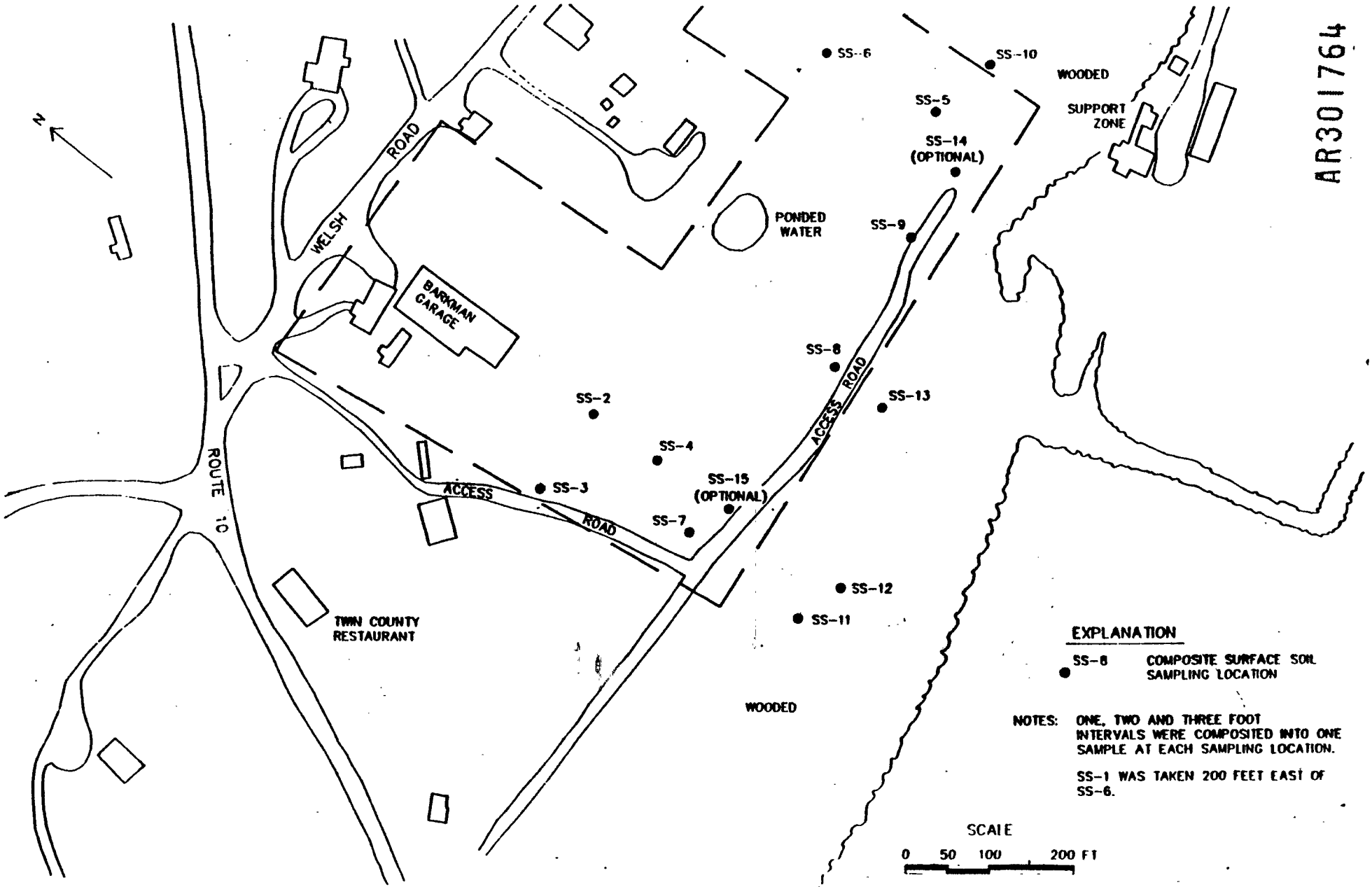

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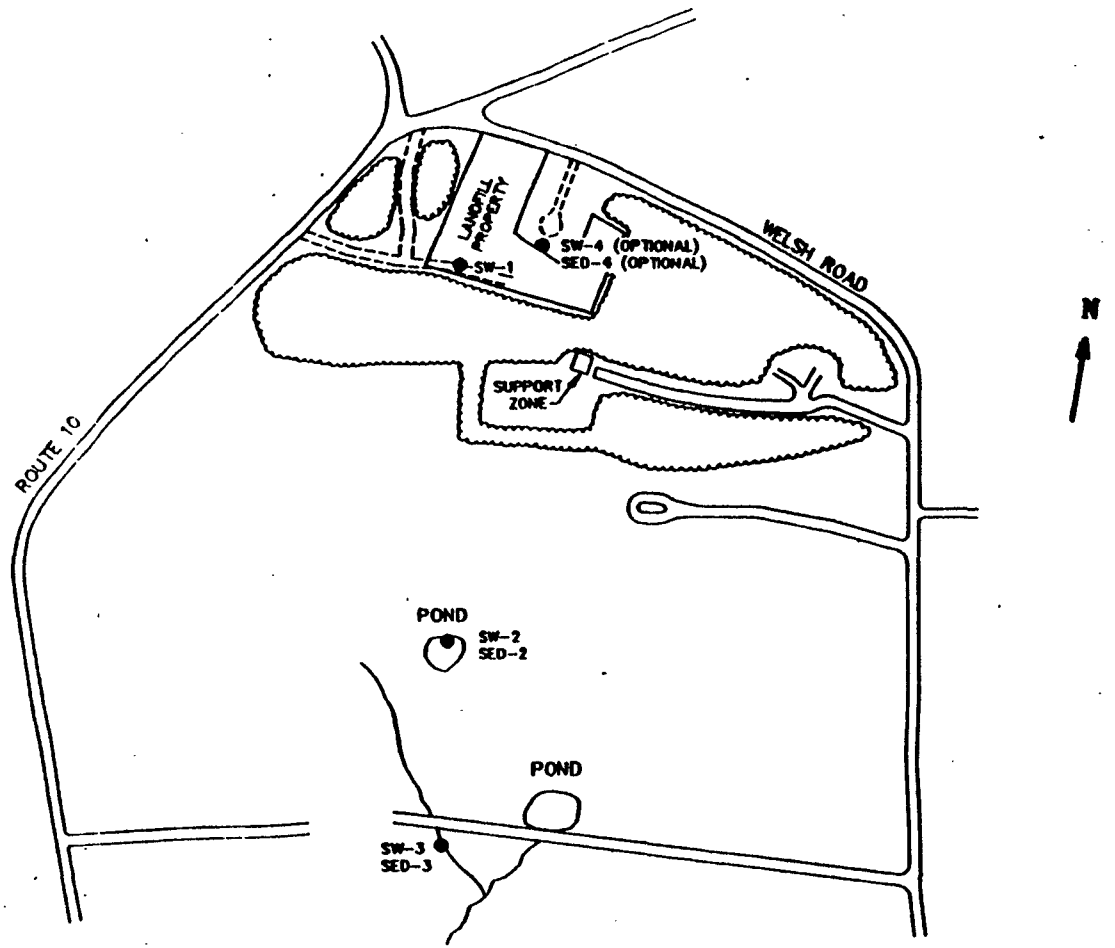
Figure 2

WELSH ROAD/BARKMAN LANDFILL SITE
SURFACE WATER AND SEDIMENT SAMPLING LOCATION
MODIFIED FROM SMC (1988)



EXPLANATION

SW-2
● SED-2 SURFACE WATER AND SEDIMENT SAMPLING LOCATION

NOTE: SEDIMENT SAMPLE AT SW-1 LOCATION IS IDENTICAL TO COMPOSITE SOIL SAMPLE TAKEN AT THIS LOCATION (SS-15).

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WELSH ROAD/BARKMAN LANDFILL SITE
MONITORING WELL SAMPLING LOCATIONS
MODIFIED FROM SMC (1988)

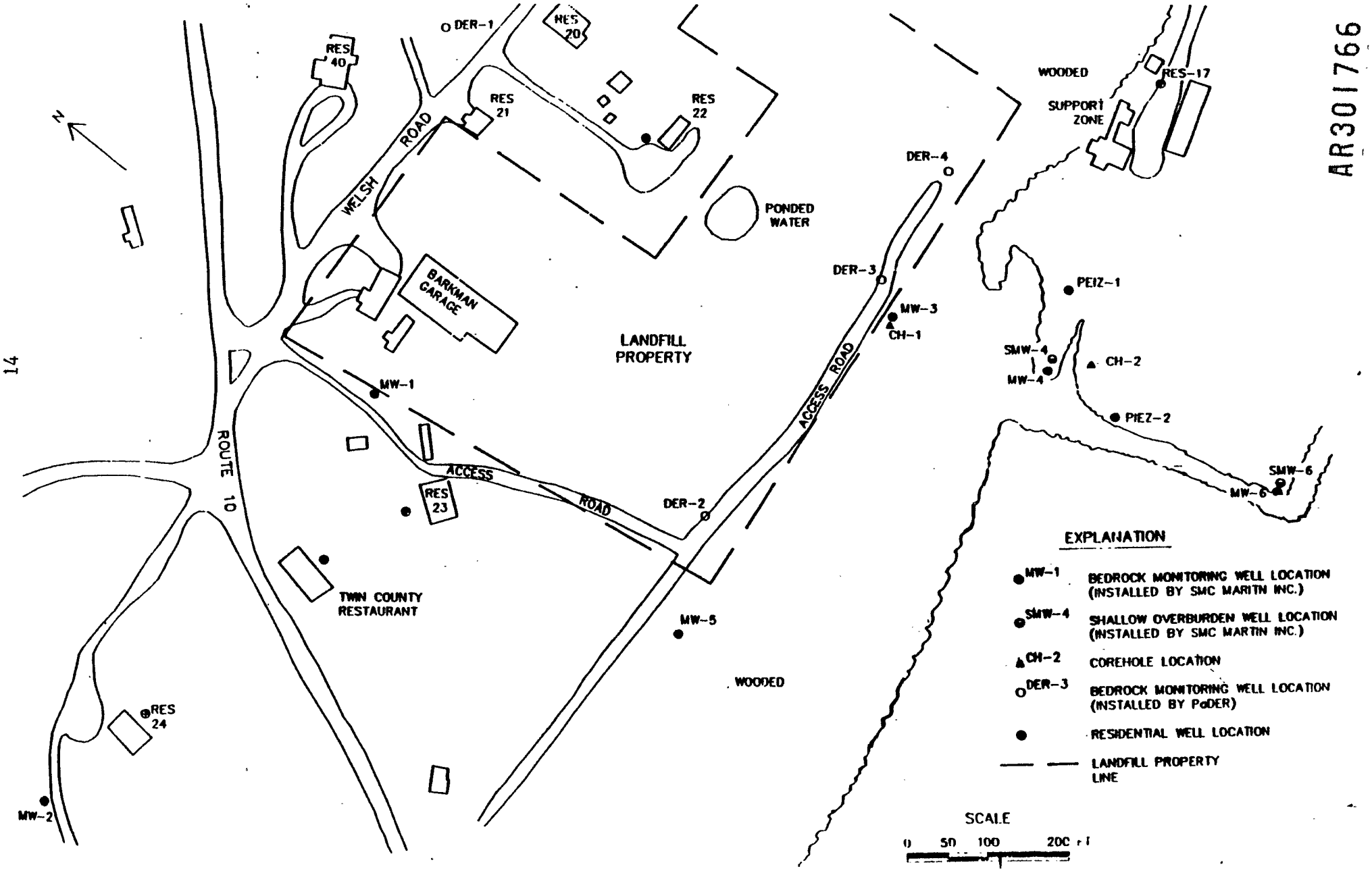
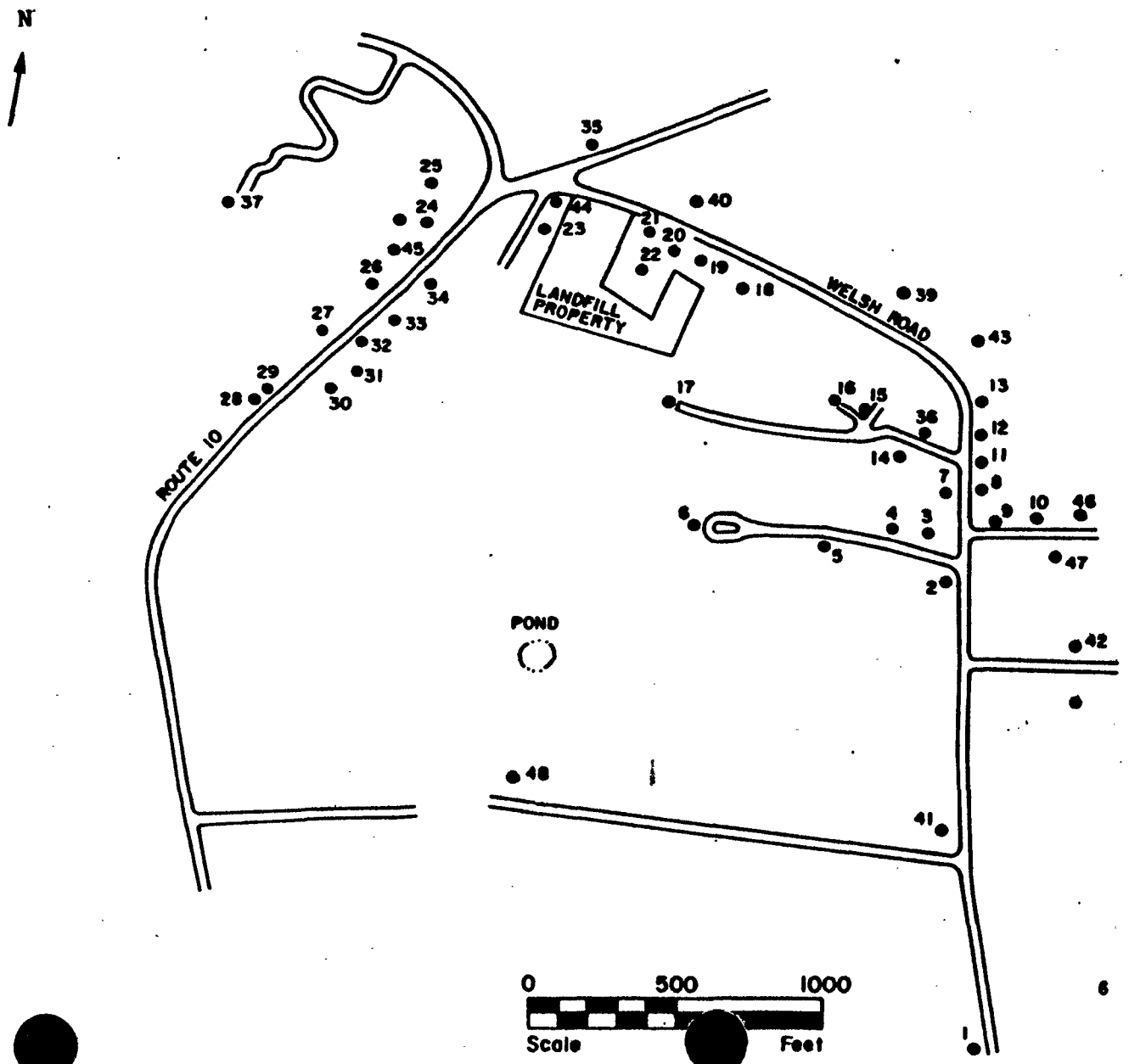


Figure 4

WELSH ROAD/BARKMAN LANDFILL SITE
RESIDENTIAL WELL SAMPLING LOCATIONS
MODIFIED FROM SMC (1988)



I.D. #	Property Owner	Multi-Use
1	B Stoltzfus	
2	R. Wingenroth	
3	L. Algier	Shares Well #4
4	E. Beechy	Shared Well
5	A. Paulson	Shares Well #4
6	L. Stoltzfus	
7	G. Cross	
8	T. Smith	
9	R. Ramsey	Shared Well
10	M. Spencer	Shares Well #9
11	D&K Degnolio	Shared Well
12	Fulton	Shares Well #11
13	Heineman	
14	J. Miller	
15	G. Manser	Shares Well #16
16	T. Stacey	Shared Well
17	T. Stacey	
18	J. Spiker	
19	J. Cole	
20	A. Fox	
21	O. Diem	
22	R. Shank	
23	M. Miller	Shares Well #44
24	R. Benner	
25	A. Blessenki	
26	F. Samuels	Shared Well
27	R. Styer	
28	J. Schouren	
29	T. Dosheng	
30	L. Stoltzfus	
31	L. Beggs	
32	M. Millard	
33	H. Logan	
34	Weitzel	No Well
35	E. Schaffer	
36	D. Shaver	
37	R. Funk	
38	–	
39	Bolick	
40	E. Barkman	
41	D. Stoltzfus	
42	L. Harsh/L. Harsh Jr./ C. Keiffer	
43	D. Hayes	
44	R. Hoffman	Shared Well
45	J. Samuels	Shares Well #26
46	D. Charron	
47	L. Brown	

6 ● RESIDENTIAL WELL SAMPLING LOCATION
(SAMPLE DESIGNATION RES-GW-6)

In July 1989, PADER contracted with Baker/TSA, Incorporated of Coraopolis, PA to complete the feasibility study, a ground water summary report, and the public health evaluation required as part of the RI/FS for the Walsh Landfill Site. Baker used the results of the RI conducted by SMC Martin in order to complete the Feasibility Study (FS) and public health evaluation.

B. Summary of RI Findings

A summary of the results from the RI sampling program conducted by SMC Martin is presented below.

Soils

a) Elevated concentrations of arsenic (17 ppm), chromium (86 ppm), copper (43 ppm), lead (115 ppm), and zinc (616 ppm) were detected in the composite soil samples collected from the southern portion of the landfill.

b) Sampling locations SS-4, SS-8, SS-12, and SS-15 OPT showed elevated levels (390-6000 ppb) of several contaminants that are classified as coal tar derivatives (acenaphthylene, phenanthrene, fluoranthene, pyrene, chyrsene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene).

c) Subsurface soil samples collected during well construction activities showed elevated levels of bis(2-ethylhexyl)phthalate (1300 ppb) at location SMW-4-SS.

Monitoring Well Sampling

a) Results from two rounds of monitoring well sampling showed elevated levels of trichloroethane, chloroethane, toluene and total xylenes (5-35 ppb range) in wells MW-1, MW-3, MW-4, MW-4, MW-5, and MW-6.

b) Bis(2-ethylhexyl)phthalate was detected at elevated levels (20-72 ppb) in samples from MW-4, MW-5, and MW-6.

c) Arsenic (34 ppb), barium (703 ppb), cadmium (20.2 ppb), chromium (48.7 ppb), lead (16 ppb), mercury (2.1 ppb), and zinc (427 ppb) were elevated in samples from several site monitoring wells. The metals aluminum, iron, magnesium, potassium, and sodium were also elevated in samples from several wells (MW-3, SMW-4, MW-4, MW-5).

Residential Well Sampling

a) Results from two rounds of residential well sampling showed elevated levels of carbon disulfide, 1,1-dichloroethane, chloroform, 2-butanone, 1,1,1-trichloroethane, bromodichloromethane, benzene, toluene, ethylbenzene and total xylenes (5-87 ppb range). These contaminants were detected in wells situated to the east and west of the landfill area.

b) Di-n-butylphthalate and bis(2-ethylhexyl) phthalate were detected at levels ranging from 11-150 ppb in several residences near the landfill.

c) High levels of iron (129,200 ppb), magnesium (11,050 ppb), and manganese (7,340 ppb) were detected at locations RES-17, RES-18, RES-23, and RES-26.

d) Barium (214 ppb), cadmium, chromium (19 ppb), cobalt (51 ppb), copper (233 ppb), lead (24.5 ppb), mercury (8.2 ppb), zinc (321 ppb), and phenols (24 ppb) were detected at elevated levels in numerous residences near the landfill.

Air

a) Results of the air quality surveillance showed elevated concentrations of chloroform (0.14 mg/m) and hydrogen chloride (4.1 mg/m) along the western perimeter of the site. These levels were detected in only one of three sampling episodes. It is assumed that these contaminants were detected from the current site operation and junkyard activities since the landfill was reportedly closed by 1976.

Tables A, B, and C summarize the maximum, minimum and average concentrations of the constituents of concern for the soils, sediments and surface water, and ground water at the site.

TABLE A

WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY STATISTICS FOR SURFACE SOIL AND SEDIMENT SAMPLES

Constituent	CONCENTRATION (µg/kg)			Frequency
	Maximum	Minimum	Mean	
Surface Soil				
Chloroform	6.00	6.00	3.28	1/20
PAHs	1.1×10^3	3.9×10^2	2.68×10^2	4/20
Arsenic	1.7×10^4	6.1×10^3	9.49×10^3	15/18
Cadmium	1.16×10^4	1.70×10^3	3.01×10^3	8/18
Lead	1.15×10^5	3.8×10^3	1.69×10^4	17/18
Nickel	5.50×10^4	5.50×10^3	1.37×10^4	17/18
Sediment				
PAHs	6.7×10^2	6.7×10^2	4.79×10^2	1/4
Cadmium	8.7×10^3	7.10×10^3	4.43×10^3	2/4
Lead	2.2×10^4	2.2×10^4	4.32×10^3	1/4
Nickel	4.3×10^4	8.7×10^3	2.09×10^4	4/4

TABLE B

WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY STATISTICS FOR SURFACE WATER SAMPLES

Constituent	CONCENTRATION (µg/l)			Frequency
	Maximum	Minimum	Mean	
Arsenic	12.20	12.20	5.98	1/5
Cadmium	3.80	3.80	2.72	1/5
Lead	10.10	9.30	4.30	2/5

TABLE C

WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY STATISTICS FOR GROUNDWATER SAMPLES

Constituent	CONCENTRATION (µg/l)			Frequency
	Maximum	Minimum	Mean	
1,1-Dichloroethane	9.00	1.00	1.82	12/113
Chloroform	87.00	8.00	2.82	7/113
Benzene	7.00	1.00	1.84	15/113
Ethylbenzene	24.00	1.00	1.73	14/113
Xylenes (Total)	35.00	2.00	1.96	12/113
Trichloroethylene	20.00	1.00	1.80	22/113
Tetrachloroethylene	3.00	1.00	2.03	16/113
Arsenic	34.00	8.30	2.62	5/116
Cadmium	24.00	2.30	2.18	14/116
Lead	106.00	2.60	2.84	43/116
Mercury	8.20	0.11	0.05	31/116
Nickel	111.00	5.30	11.80	16/116

C. Conclusions from the RI

The data collected during the RI do not identify any one specific source area of contamination, other than the landfill as a whole. In general, the RI identified localized areas of contamination in both soils and ground water. Elevated levels of contaminants were detected in surface soils, sediment and surface water on top of, downgradient from, and adjacent to the landfill; levels of contaminants decreased with greater distance from the site.

Ground water contamination also appeared to be present in certain localized areas, with only one area identified as a potential plume migrating from the landfill. This area extends approximately 600 feet south of the landfill property, and the characteristic contaminants include: toluene, ethylbenzene, xylene, trichloroethylene, and 1,1-dichloroethane. The RI data, however, did not reveal a well defined plume.

Residential well sampling completed prior to, and during the RI provided water chemistry information on 49 residences situated adjacent to the site. Results of this sampling showed that elevated levels of site-related contaminants were being detected in residential wells at random intervals and varying concentrations. Due to the uncertainties associated with predicting contaminant flow in ground water, PADER issued a drinking water advisory and began to provide bottled drinking water to 44 residential units in March 1989 as an interim remedial action. While the primary health risks from contaminated well water have been addressed, the residents remain potentially exposed to volatile contaminants when bathing or washing with well water.

The geology at the site is complex, and thus the testing completed during the RI did not succeed in identifying or predicting preferential flow pathways for contaminants to move in the subsurface. Based on historical sampling data, it appears that a contaminant plume originating at the landfill may have existed at one time. The RI data, however, did not succeed in defining the extent of such a plume nor did it show that any plume exists currently. The data also did not suggest that such a plume will develop in the future.

VII. SUMMARY OF SITE RISKS

The Public Health Evaluation addresses the human health and environmental impacts associated with the existing contamination at the Walsh Landfill Site. The evaluation assesses the risks associated with the no action alternative, or the risks posed in the absence of remedial corrective action.

The public health evaluation is based on the results of sampling completed during the RI (1987,1988), and residential well sampling completed during 1989. This sampling data were reviewed to identify chemicals that would be evaluated during the public health evaluation. A selection process was used to identify the chemicals present at the site that pose the greatest potential public health risk. Chemicals were selected for detailed evaluation if they were present in environmental media at levels above background concentrations and based on their characteristic toxicity, mobility, persistence, and quantity.

The primary risks posed by the site are the contaminated drinking water supply and the landfill soils and sediments. The concentrations of individual contaminants (maximum, minimum, average concentrations) that contribute to this risk are described in Tables A, B, and C.

The response actions for the first OU will remove these risks, stabilize the site, and substantially reduce further degradation of the ground water aquifer at the site. The response actions will serve to rapidly and permanently address the primary risks to the local residents (contaminated well water) that have been present for over two years. The response action will also remove additional risks that may be caused by the continuing salvage and solid waste transfer operations by requiring these operations to cease.

A. Exposure Assessment Summary

The goal of the exposure assessment is to determine the type and magnitude of potential human exposure to the contaminants present at, and migrating from, the Walsh Landfill Site. The exposure assessment was conducted to estimate the risk imposed by the site if no remedial action was taken.

To determine if human and environmental exposure to the contaminants of concern might occur in the absence of remedial action, an exposure pathway analysis was performed. An exposure pathway is comprised of four necessary elements: 1) a source and mechanism of chemical release; 2) an environmental transport medium; 3) a human or environmental exposure point, and 4) a feasible human or environmental exposure route at the point of exposure. This section of the ROD summarizes the potential for completion of exposure pathways at the Walsh Landfill Site.

1. Air Exposure Pathway and Population

There are two potential release mechanisms to be considered in evaluating the air pathways: release of contaminated particulates and volatilization from surface soil, ground water and surface water. The release mechanisms to the air are fugitive dust generation and volatilization; the transport mechanism is the air. The route for human exposure to contaminated air is via inhalation. Potential exposure points from the site are areas of human activity next to the site and residential users of contaminated ground water for showering and bathing.

The population potentially exposed via the air pathway includes the residents of the approximately 49 homes near the site and workers at the landfill.

2. Soil Exposure Pathway and Population

The two potential release sources for the soil pathway include the contents of the landfill and contaminated soils. The release mechanisms are fugitive dust generation and deposition, tracking, surface runoff, and leaching: the transport media are the surface and subsurface soils, and surface water sediments. The routes for human exposure include ingestion, inhalation, and dermal contact. Potential exposure points from the site include areas of human activity on and adjacent to the site.

The population potentially exposed via the soil pathway includes adults and small children from approximately 49 homes in the landfill area. Onsite workers could also be exposed via incidental ingestion and dermal contact.

3. Ground Water Exposure Pathway and Population

The two potential release sources for the ground water pathway include landfill contaminants and contaminated soils. The release mechanism is site leaching and the transport medium is the ground water in the soil overburden and bedrock aquifers. Human exposure routes to contaminated ground water include ingestion, inhalation and dermal contact. Potential exposure points from the site are potable wells in the local area that withdraw contaminated ground water.

The population potentially exposed via the ground water pathway includes the residents from approximately 49 homes near the site with potable wells. This group includes those residents who are currently receiving bottled water supplies.

4. Surface Water Exposure Pathway and Population

The two potential release sources for the surface water pathway include contaminated soils and ground water. The release mechanisms are surface runoff and ground water seepage; the transport mechanism is surface water originating from local ground water discharge and the headwaters of the West Branch of Brandywine Creek. The routes for human exposure are via dermal contact and incidental ingestion; surface waters are not known to be used as a potable water supply.

The population potentially exposed via the surface water pathway includes small children who reside in the 49 residential structures near the site. Environmental receptors may include aquatic species living in the surface waters and cattle using surface water as a drinking supply.

RT Toxicity Assessment Summary

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for site-related contaminants to cause adverse effects in exposed individuals, and to provide an estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and severity of adverse effects.

Table D summarizes the public health and environmental criteria for the contaminants of concern at the site. This information is developed using data on the fate and transport, or distribution relationships (transport between air, water, soil, and biota), of individual contaminants, and the documented health effects or health hazards posed by individual contaminants. The toxicity of contaminants is determined based on the observed effects on humans and/or laboratory animals, and is obtained from published literature describing epidemiologic or toxicologic studies. Table D primarily summarizes health-related information for the contaminants of concern at the site, and includes such data as: enforceable standards for public water supplies; and classification of contaminants as carcinogenic or non-carcinogenic.

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of mg/kg-day, are multiplied by the estimated intake of potential carcinogen mg/kg-day, to provide an upper bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. CPFs are derived from the results of human epidemiological studies or chronic animal bioassay to which animal-to-human extrapolation and uncertainty factors have been applied.

Reference doses (RFDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RFDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media can be compared to the RFD. RFDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied. These uncertainty factors help ensure that the RFDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

TABLE D

WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY OF PUBLIC HEALTH AND ENVIRONMENT CRITERIA

Chemical	1,1-Dichloroethane	Tetrachloro-ethylene	Trichloro-ethylene	Chloroform	Benzene	Ethylbenzene	Xylene (Total)	Benzo(a) Pyrene (Representing PAHs Carcinogens)	Arsenic	Cadmium	Lead	Mercury	Nickel
AIC (mg/kg/day)													
Oral	1×10^{-1}	1.0×10^{-2}		1.0×10^{-2}		1.0×10^{-1}	2.0	-	$1 \times 10^{-3*}$	5.0×10^{-4}		3.0×10^{-4}	2.0×10^{-2}
Reference	HEAST	IRIS		IRIS		IRIS	IRIS		IRIS	HEAST		HEAST	IRIS
Inhalation	1×10^{-1}						4.0×10^{-1}						
Reference	HEAST						HEAST						
PF (mg/kg/day)$^{-1}$													
Oral	9.1×10^{-2}	$5.1 \times 10^{-2*}$	1.1×10^{-2}	6.1×10^{-3}	2.9×10^{-2}			11.5*	1.75		1.84×10^{-2}		
Reference	HEAST	HEAST	IRIS	IRIS	IRIS	IRIS		SPHEM	HEAST		EPA III	IRIS	
Weight-of-Evidence	B2	B2	B2	B2	A	D		B2	A		B2	D	
Inhalation		$3.3 \times 10^{-2*}$	1.3×10^{-2}	8.1×10^{-2}	2.9×10^{-2}			6.1*	5.00×10^{1}	6.1	1.84×10^{-2}		1.7 (Refinery Dust), 8.4×10^{-1} (NiSx)
Reference		HEAST	IRIS	IRIS	IRIS	IRIS		SPHEM	IRIS	IRIS	EPA III	IRIS	IRIS
Weight-of-Evidence		B2/C	B2	B2	A	D		B2	A	B1	B2	D	A
MCL (µg/l) (IRIS)	--	200	5	100**	5	--			50	10	50	2	
Water Quality Criteria (µg/l) Aquatic Organisms (Fresh Water)													
Acute		695	2,250	1,945	640	2,900			360	3.9	8.2	2.4	1,400
Chronic		139	450	389	128	580			190	1.1	3.2	0.012	1160
Reference		PADER	PADER	PADER	PADER	PADER			PADER	PADER	PADER	PADER	PADER

* Under EPA Review
** Total Trihalomethanes

HEAST = Health Effects Assessment Summary Tables (EPA, 1989c)
IRIS = Integrated Risk Information System (EPA, 1989b)
EPA III = Environmental Protection Agency - Region III
SPHEM = Superfund Public Health Evaluation Manual (EPA, 1986a)
PADER = Pennsylvania Department of Environmental Resources (PADER, 1989)

C. Risk Characterisation Summary

The risk characterization process is the final step in completing the public health evaluation for the site conditions. In this step, the toxicity and exposure assessments are summarized and integrated into quantitative and qualitative expressions of risk. To characterize potential non-carcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, probabilities over a lifetime that an individual will develop cancer due to site-related exposure are estimated from projected intakes and chemical-specific dose-response information. In addition, comparisons are made between chemical-specific ARARs and estimated concentrations of constituents of concern. These comparisons include: (1) an average exposure (AE) scenario using the mean concentrations of the medium-specific sample results and average values for each parameter in the exposure assessment equations; and (2) a worst-case exposure (WCE) scenario using the maximum constituent concentrations from the media-specific sample results and the upper end range (90th or 95th percentile) for each parameter in the exposure assessment equations. The exposure scenarios are then used to estimate individual risks.

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (i.e., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, an individual has a one in a million chance of developing cancer as a result of site related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ). The HQ is determined by calculating the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose. By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

Tables E, F, and G summarize the potential carcinogenic and noncarcinogenic risks posed to adults, children, and landfill workers who may be exposed to site-related contaminants via the associated exposure pathways. These tables present calculated health risks for exposure to each contaminant of concern via the average and worst-case exposure scenarios. Each table also presents a total for the combined risks (carcinogenic and non-carcinogenic) posed by exposure to all contaminants via the combination of exposure pathways that are reasonably expected to affect the human receptors for the Site (i.e., adults and children residing near the landfill and landfill workers).

When reviewing the quantitative information presented in these summary tables, the following threshold levels should be used. For noncarcinogenic risks, a chronic hazard index value above a value of 1.0 indicates the potential for an adverse health impact. For the carcinogenic risks, a value greater than the 10^{-4} to 10^{-6} is generally recognized as indicating a risk beyond the acceptable level.

Tables E, F, and G show that the highest health risks are posed by the worst-case exposure scenarios, or exposure via combined pathways to the maximum concentrations of site-related contaminants. The child receptors, or children in the local community, appear to have the highest potential health risk from exposure to the site conditions. While the health risks posed by the average exposure scenarios do not appear to reflect an elevated risk, there are several factors which make consideration of the worst case scenario more realistic for decision making on the basis of protectiveness. These factors include the absence of control for site access and the continuing waste and refuse handling and disposal practices at the site. The specific nature of the continued operations at the site are undefined, but it is likely that hazardous substances are being handled, and possibly stored and/or disposed of, on and around the site property, to which access is readily available. Due to these circumstances, it is more realistic to view the risk levels calculated through the worst case scenarios as protective of human health and the environment.

TABLE E

WELSH ROAD/BARKMAN LANDFILL SITE
TOTAL CHRONIC HAZARD AND RISK FROM POTENTIAL CARCINOGENS
CHILD RECEPTOR

Constituent	CHRONIC HAZARD INDEX					
	Inhalation		Oral		Dermal Contact	
	AE	WCE	AE	WCE	AE	WCE
1,1-Dichloroethane	2.2×10^{-3}	8.0×10^{-2}	4.5×10^{-4}	4.2×10^{-3}	3.4×10^{-7}	3.2×10^{-6}
Chloroform			7.0×10^{-3}	4.0×10^{-1}	1.6×10^{-5}	4.0×10^{-4}
Benzene						
Ethylbenzene			4.3×10^{-4}	1.1×10^{-2}	3.2×10^{-7}	8.5×10^{-6}
Xylenes	4.8×10^{-4}	6.6×10^{-2}	2.4×10^{-5}	8.1×10^{-4}	1.8×10^{-8}	6.2×10^{-7}
Trichloroethylene						
Tetrachloroethylene			5.1×10^{-3}	1.4×10^{-2}	3.8×10^{-6}	1.1×10^{-5}
PAHs						
Arsenic			1.5×10^{-1}	2.4	1.2×10^{-2}	1.0×10^{-1}
Cadmium			2.4×10^{-1}	4.3	1.9×10^{-2}	2.5×10^{-1}
Lead						
Mercury			4.2×10^{-3}	1.3	3.1×10^{-6}	9.7×10^{-4}
Nickel			3.0×10^{-2}	5.0×10^{-1}	2.2×10^{-3}	3.0×10^{-2}
TOTAL	2.6×10^{-3}	1.5×10^{-2}	4.4×10^{-1}	8.9	3.4×10^{-2}	3.8×10^{-1}

TOTAL CHRONIC HAZARD INDEX AE: 4.7×10^{-1} WCE: 9.4

AE - Average Exposure Scenario
WCE- Worst-case Exposure Scenario

TABLE E - CONTINUED

WELSH ROAD/BARKMAN LANDFILL SITE
TOTAL CHRONIC HAZARD AND RISK FROM POTENTIAL CARCINOGENS
CHILD RECEPTOR

Constituent	POTENTIAL CARCINOGENIC RISK					
	Inhalation		Oral		Dermal Contact	
	AE	WCE	AE	WCE	AE	WCE
1,1-Dichloroethane			3.3×10^{-7}	6.1×10^{-6}	2.5×10^{-10}	4.6×10^{-9}
Chloroform	2.2×10^{-6}	1.0×10^{-3}	3.4×10^{-8}	3.9×10^{-6}	7.7×10^{-11}	3.7×10^{-9}
Benzene	4.8×10^{-7}	2.8×10^{-5}	1.1×10^{-7}	1.5×10^{-6}	7.9×10^{-11}	1.1×10^{-11}
Ethylbenzene						
Xylenes						
Trichloroethylene	2.1×10^{-7}	3.6×10^{-5}	3.9×10^{-8}	1.6×10^{-6}	2.9×10^{-11}	1.2×10^{-9}
Tetrachloroethylene	5.7×10^{-8}	1.3×10^{-6}	2.1×10^{-7}	1.1×10^{-6}	1.5×10^{-10}	8.6×10^{-10}
PAHs	5.0×10^{-8}	1.6×10^{-6}	3.1×10^{-6}	8.1×10^{-5}	6.3×10^{-6}	1.2×10^{-4}
Arsenic	1.4×10^{-5}	2.0×10^{-4}	1.5×10^{-5}	5.6×10^{-4}	1.7×10^{-6}	2.2×10^{-5}
Cadmium	5.6×10^{-7}	1.7×10^{-5}				
Lead	9.4×10^{-9}	5.1×10^{-7}	2.4×10^{-7}	2.5×10^{-5}	3.2×10^{-8}	1.6×10^{-6}
Mercury						
Nickel	7.1×10^{-7}	2.2×10^{-5}				
TOTAL	1.9×10^{-5}	1.3×10^{-3}	1.9×10^{-5}	6.8×10^{-4}	8.1×10^{-6}	1.4×10^{-4}

TOTAL POTENTIAL CARCINOGENIC AE: 4.6×10^{-5} WCE: 2.2×10^{-3}

TABLE F

WELSH ROAD/BARKMAN LANDFILL SITE
TOTAL CHRONIC HAZARD AND RISK FROM POTENTIAL CARCINOGENS
ADULT RECEPTOR

Constituent	CHRONIC HAZARD INDEX						POTENTIAL CARCINOGENIC RISK					
	Inhalation		Oral		Dermal Contact		Inhalation		Oral		Dermal Contact	
	AE	WCE	AE	WCE	AE	WCE	AE	WCE	AE	WCE	AE	WCE
1,1-Dichloroethane	5.4×10^{-4}	2.1×10^{-2}	2.7×10^{-4}	2.6×10^{-3}	2.8×10^{-7}	2.7×10^{-6}			3.0×10^{-7}	9.3×10^{-6}	3.1×10^{-10}	9.8×10^{-9}
Chloroform			4.2×10^{-3}	2.5×10^{-1}	4.4×10^{-6}	2.6×10^{-4}	8.5×10^{-7}	6.6×10^{-4}	3.1×10^{-8}	6.0×10^{-6}	3.2×10^{-11}	6.3×10^{-9}
Benzene							1.9×10^{-7}	1.8×10^{-5}	9.6×10^{-8}	2.3×10^{-6}	1.0×10^{-10}	2.4×10^{-9}
Ethylbenzene			2.6×10^{-4}	6.8×10^{-3}	2.7×10^{-7}	7.2×10^{-6}						
Xylenes	1.2×10^{-4}	1.7×10^{-2}	1.5×10^{-5}	5.0×10^{-4}	1.5×10^{-8}	5.2×10^{-7}						
Trichloroethylene							8.2×10^{-8}	2.3×10^{-5}	3.6×10^{-8}	2.5×10^{-6}	3.7×10^{-11}	2.6×10^{-9}
Tetrachloroethylene			3.0×10^{-3}	8.5×10^{-3}	3.2×10^{-6}	9.0×10^{-6}	2.2×10^{-8}	8.3×10^{-7}	1.9×10^{-7}	1.7×10^{-6}	1.9×10^{-10}	1.8×10^{-9}
PAHs							9.3×10^{-9}	5.4×10^{-7}				
Arsenic			3.9×10^{-2}	9.7×10^{-1}	4.1×10^{-5}	1.0×10^{-3}	2.7×10^{-6}	6.9×10^{-5}	8.2×10^{-6}	6.8×10^{-4}	8.6×10^{-9}	7.1×10^{-7}
Cadmium			6.5×10^{-2}	1.4	6.8×10^{-5}	1.4×10^{-3}	1.0×10^{-7}	5.7×10^{-6}				
Lead							1.8×10^{-9}	1.7×10^{-7}	9.4×10^{-8}	2.2×10^{-5}	9.7×10^{-11}	2.3×10^{-8}
Mercury			2.5×10^{-3}	7.8×10^{-1}	2.6×10^{-6}	8.2×10^{-4}						
Nickel			8.8×10^{-3}	1.6×10^{-1}	9.2×10^{-6}	1.7×10^{-4}	1.3×10^{-7}	7.6×10^{-6}				
TOTAL	6.8×10^{-4}	3.8×10^{-2}	1.2×10^{-1}	3.5	1.3×10^{-4}	3.7×10^{-3}	4.1×10^{-6}	7.9×10^{-4}	9.0×10^{-6}	7.2×10^{-4}	9.3×10^{-9}	7.6×10^{-7}

TOTAL CHRONIC HAZARD INDEX AE: 1.2×10^{-1} WCE: 3.6 **TOTAL POTENTIAL CARCINOGENIC RISK** AE: 1.3×10^{-5} WCE: 1.5×10^{-3}

TABLE G

WELSH ROAD/BARKMAN LANDFILL SITE
TOTAL CHRONIC HAZARD AND RISK FROM POTENTIAL CARCINOGENS
LANDFILL RECEPTOR

Constituent	CHRONIC HAZARD INDEX				POTENTIAL CARCINOGENIC RISK					
	Oral		Dermal Contact		Inhalation		Oral		Dermal Contact	
	AE	WCE	AE	WCE	AE	WCE	AE	WCE	AE	WCE
1,1-Dichloroethane	6.2×10^{-5}	4.4×10^{-4}					1.1×10^{-7}	1.6×10^{-6}		
Chloroform	9.7×10^{-4}	4.3×10^{-2}	3.5×10^{-6}	2.2×10^{-5}	4.7×10^{-11}	3.2×10^{-10}	1.2×10^{-8}	1.0×10^{-6}	4.2×10^{-11}	5.4×10^{-11}
Benzene							3.7×10^{-8}	4.0×10^{-7}		
Ethylbenzene	5.9×10^{-5}	1.2×10^{-3}								
Xylenes	3.4×10^{-6}	8.6×10^{-5}								
Trichloroethylene							1.4×10^{-8}	4.3×10^{-7}		
Tetrachloroethylene	7.0×10^{-4}	1.5×10^{-3}					7.1×10^{-8}	3.0×10^{-7}		
PAHs					2.9×10^{-7}	4.4×10^{-6}	6.0×10^{-8}	4.9×10^{-7}	2.6×10^{-6}	7.4×10^{-5}
Arsenic	9.9×10^{-3}	1.7×10^{-1}	4.0×10^{-3}	2.5×10^{-2}	8.4×10^{-5}	5.6×10^{-4}	3.5×10^{-6}	1.2×10^{-4}	1.4×10^{-6}	1.7×10^{-5}
Cadmium	1.6×10^{-2}	2.4×10^{-1}	2.5×10^{-3}	3.4×10^{-2}	3.3×10^{-6}	4.7×10^{-5}				
Lead					5.5×10^{-8}	1.4×10^{-6}	4.2×10^{-8}	3.9×10^{-6}	2.6×10^{-8}	1.2×10^{-6}
Mercury	5.7×10^{-4}	1.3×10^{-1}								
Nickel	2.1×10^{-3}	2.7×10^{-2}	2.9×10^{-4}	4.0×10^{-3}	4.1×10^{-6}	6.2×10^{-5}				
TOTAL	3.0×10^{-2}	6.1×10^{-1}	6.8×10^{-3}	6.3×10^{-2}	9.2×10^{-5}	6.8×10^{-4}	3.8×10^{-6}	1.3×10^{-4}	4.0×10^{-6}	9.3×10^{-5}

TOTAL CHRONIC HAZARD INDEX AE: 3.7×10^{-2} WCE: 6.8×10^{-1}
TOTAL POTENTIAL CARCINOGENIC AE: 1.0×10^{-4} WCE: 8.9×10^{-4}

D. Uncertainty Analysis

The procedures and inputs used in the public health evaluation for the Walsh Landfill Site are subject to uncertainties. In general, the main sources of uncertainty include: environmental chemistry sampling and analysis; environmental parameter measurement; fate and transport modelling; exposure parameter estimation; and, toxicological information. Each of these sources of uncertainty is discussed in detail in the Public Health Evaluation Report completed by Baker/TSA, Incorporated. This report is part of the Administrative Record for the site.

E. Risk Assessment Conclusions

The Walsh Landfill Site's surface soils and ground water have a significant potential adverse health impact on receptor populations as calculated by the chronic health index and the risk from potential carcinogens indices. There were three complete exposure pathways identified: the air exposure pathway via inhalation of ground water and particulates by receptors; the ground water exposure pathway via ingestion, inhalation, and dermal contact by receptors of water supply wells; and, the soil exposure pathway via ingestion and dermal contact by receptors.

The air pathway was not deemed to represent a significant health hazard with respect to the volatilization of organics from the surface waters or from surface soils. However, the air pathway was deemed to represent a potential health hazard from inhalation of volatile organics during showering and bathing and fugitive dust caused by vehicle traffic. The chemicals contributing the most significantly to the potential adverse health impacts and risks from the inhalation of volatile organics included chloroform, benzene, trichloroethylene and tetrachloroethylene. These contaminants were detected in the ground water samples collected during and after the RI/FS. The exposed population included children and adults living in the local area and using the ground water for domestic purposes. The chemicals contributing the most significantly to the potential adverse health impacts and risks from fugitive dust inhalation included PAHs, arsenic, cadmium, lead and nickel. The exposed population included landfill workers and local residents living downwind of the landfill.

The soil pathway was identified as a health hazard from ingestion and dermal contact exposure to contaminated surface soils and sediments. The landfill workers are potentially at risk from dermal contact with surface soils contaminated with PAHs, arsenic, and lead. In addition, the children in the area are potentially at risk from ingestion and dermal contact with sediments contaminated with PAHs and lead. However, only the sediments found onsite at location SED-4/OPT (See Figure 2) were contaminated with PAHs and lead.

The ground water exposure pathway represented a potentially significant health risk, as indicated by chronic health index values greater than one, and projected carcinogenic risk values above the target risk values of 1×10^{-6}. The compounds contributing the most to the potential health impacts were 1,1-dichloroethane, chloroform, benzene, trichloroethylene, tetrachloroethylene, arsenic, cadmium, lead and mercury. The exposed population includes children and adults living and working in the local area and using the ground water for domestic purposes. The exposed population has been preliminarily defined as the 49 residences situated along PA Route 10 and Welsh Road, whose water supply wells were sampled during the RI/FS, and where contaminants were detected at elevated levels. In addition, residences situated along the general direction of regional ground water flow are included in the group as potentially impacted by contaminated ground water in order to address possible future health impacts.

Future land use in the site area will include residential dwellings and farming. Honeybrook Township and the Borough of Honey Brook have expressed a desire to control future development by restricting growth to that of a farming or low-density residential nature within the municipalities where the Walsh Site is located. To this end, future growth is likely to be controlled by the local government's zoning and permitting process.

Based on the limited information available, the surface water exposure pathway did not appear to represent a significant risk to human health. The metals cadmium and lead occurred at concentrations above their respective ARARs for protection of

aquatic life at locations SW-1 and SW-4 (See Figure 2). However, these contaminated surface waters did not support a diverse or highly productive aquatic life community. In addition, these surface waters are present on an intermittent basis, and depend greatly on precipitation. The remedial action selected for this operable unit will involve capping the landfill surface, which includes the areas of periodically ponded water.

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

VII. DESCRIPTION OF ALTERNATIVES

Five remedial alternatives were retained from the feasibility study to address the first OU. These alternatives were designed to eliminate or reduce the health risk posed to the local community by exposure to contaminated ground water and landfill soils. Each alternative was evaluated against the following criteria: the overall protection of public health and the environment; how well the action complies with State and Federal laws and advisories (ARARs); its short-term effectiveness; its long-term effectiveness; how well the action reduces toxicity, mobility, and volume; the implementability of the alternative; the acceptance (or rejection) of the alternative by the State and community; and the total cost of the alternative. Table ES-1 presents a summary of the detailed evaluation that was completed using these criteria. Table ES-1 also includes cost figures for each alternative, and Table H provides a detailed cost breakdown for the selected remedy.

Remedial Action Alternative No. 1 - No Action

The No Action alternative is required by the National Contingency Plan (NCP) for consideration during the detailed analysis and is included for purposes of comparison. If No Action was chosen at the Walsh Landfill Site, the present and future potential health risks would go unabated. The No Action

alternative does not meet SARA's mandate to be protective of public health and the environment. It is also very unlikely that the State or community would accept No Action at the site.

The No Action alternative includes no remedial action to clean up contamination or to address risks posed by the site. The current provision of bottled drinking water would cease; however, this alternative would provide for continued ground water monitoring. This monitoring consists of the annual collection, analysis, and evaluation of ground water samples collected from site monitoring wells, piezometers, and residential wells, to further define the extent, migration, and fate of indicator contaminants and to track contaminant movement in the ground water. The results of the sampling would be used to assess any risks and to provide a baseline with which future results and risks may be compared. Detailed reviews of site conditions as required by CERCLA would be performed at five-year intervals.

Remedial Action Alternative No. 2 - Institutional Actions

Alternative No. 2 consists of four activities: expansion of an existing water supply system; ground water monitoring; fencing; and, property deed modifications. The principal activity is the expansion of the Honey Brook Borough Water Authority's water supply system to provide a long-term source of potable water to residents affected by contaminated water in the site vicinity. An eight-inch main line from the Honey Brook Water Supply System currently extends to a location approximately one mile south-southwest of the landfill. This eight-inch line would be extended to, and along PA State Route 10 to a storage tank near the top of Welsh Mountain. From the storage tank the water would be distributed by gravity flow through 2-inch and 4-inch mainlines to approximately 50 households. The water supply system expansion involves two components: extension of the current system; and upgrade of the system capacity.

The major components of the water supply system extension include an eight-inch mainline, four-inch and two-inch distribution lines, a booster pump, and a 120,000 gallon water storage tank. This design may be affected by ordinances imposed by Honeybrook Township which may require using minimum six-inch distribution lines. These ordinances may also include mandatory well abandonment and connection to the new system for domestic use.

The water supply system upgrade consists of the installation of one water supply well and connection of this well to the current distribution system. It is estimated that this water well will increase the current system capacity by an estimated 115,000 gpd. This should provide sufficient additional system capacity to supply affected residents with potable water as well as to satisfy fire flow demand.

The approximately 50 households to be serviced by the water line extension comprise the group of homes whose wells were sampled during the RI/FS. These homes have been identified as those presently or potentially at risk from contaminated ground water from the site. Ground water monitoring activities will include the sampling of site monitoring wells to track contaminant movement, and further define the migration and fate of site-related contaminants to ensure that homes outside of the water line extension area will not be at risk. Through this and the work to be performed for the second OU, the ground water flow dynamics will be defined, and EPA will be better able to identify any additional homes that may be impacted by contaminated ground water.

EPA (and the State) will not be responsible for the operation and maintenance of the water supply system once it is operational. Control of the new water lines will be transferred to the Honey Brook Borough Water Authority as soon as construction is complete. Therefore, construction details must meet the requirements of Honey Brook Borough and Honeybrook Township, as well as local fire codes.

Additional activities include the construction of a six-foot high fence topped with either barbed wire or razor ribbon around the perimeter of the landfill. It will be necessary to locate property boundaries and the lateral extent of the landfilled material prior to constructing the fence. The fence is designed to restrict access to the site and prevent use of the property for continued or future waste disposal. In addition, deeds for properties underlying, or in the vicinity of the landfill would be modified to indicate the landfill presence, restrict future use and property development, and restrict the use of ground water by preventing the installation of wells on the property.

This alternative could be implemented relatively quickly; it is expected to take approximately one year to design and construct the water line extension. Coordination with the Honey Brook Borough, Honey Brook Borough Water Authority, Honeybrook Township, and the Chester County Health Department will be required for the construction of the water supply system expansion.

The techniques involved in connecting the residences to a public water system are well established and use common engineering and construction practices. Generally, public water systems are very reliable and require only limited maintenance. The water quality of the proposed system will be regulated by the National Primary Drinking Water Regulations and the Pennsylvania Water Quality Standards, in conjunction with the requirements of the Chester County Health Department and the Honey Brook Borough Water Authority. This action will be in compliance with the ARARs for the Walsh Landfill Site.

This alternative will require the approval of the Honey Brook Borough Water Authority. The Authority is currently planning to expand their system's capacity. Through preliminary discussions with EPA and the State, the Authority has indicated that this proposed extension to service the approximately 50 homes will fit within the scope of their system's design. The Authority has expressed concern with the well abandonment issue, and may pursue making abandonment mandatory for those households being hooked up to the water line extension.

Remedial Action Alternative No. 3 - Institutional Actions

Alternative three consists of four actions: bottled water supply; ground water monitoring; fencing; and property deed modifications. This alternative is similar to RAA No. 2, with the primary difference being the use of bottled water rather than the expansion of a water supply system. Based on the supply schedule currently in place, it is estimated that approximately 44 to 50 households would require delivery of three cases of bottled water every two weeks to be used as their drinking water source.

These residents will continue to use their well water for washing and bathing activities, which may expose the residents to volatile organics detected in ground water via the inhalation exposure pathway. This alternative therefore is not protective of human health, but it is included based on input received from the community. Several residents expressed a desire to continue receiving bottled water as a permanent remedy for contaminated ground water exposure, regardless of any continued health risk.

As with RAA No. 2, ground water monitoring activities involving the sampling of site monitoring wells and residential wells on an annual and five-year review basis will be completed. This monitoring will serve to track contaminant movement, and to aid in the further definition of the migration and fate of site-related contaminants. This monitoring will assist in identifying any additional homes that may be impacted by contaminated ground water.

The fencing and property deed modification activities included in this alternative are identical to those described for RAA No. 2. The fencing will serve to restrict site access, but does not address threats posed by fugitive dust. Long-term management of this alternative will require periodic site inspections to assess changes in site conditions and usage of the site by local residents or the owner. Five-year reviews, including sampling of wells, an assessment of risks posed by the site, and an inspection of the integrity of the fence will be required.

Remedial Action Alternative No. 4 - Institutional and Containment Actions

Alternative number four includes both institutional and containment actions to address risks posed by contaminated ground water and onsite contaminated materials. This alternative consists of six activities: expansion of an existing water supply system; ground water monitoring; fencing; property deed modifications; resource recovery; and capping. The first four activities were described previously for RAA No. 2.

The resource recovery activities may include, but will not be limited to, salvaging the items found on, or near the surface of the landfill such as cars, buses, appliances, storage tanks,

dumpsters, batteries, and tires. These items will be decontaminated, if necessary, and removed from the site by qualified salvaging subcontractors. The decontamination of the bulky items would be completed in a designated and specially constructed area on or near the site. Any water generated during the decontamination would be contained and sampled for analysis prior to properly disposing of it. The resource recovery activities include demolition of onsite buildings and the excavation and removal of underground storage tanks that may be present at the site. The purpose of the resource recovery action is to remove recoverable or salvageable materials from the site in a cost effective manner so that the landfill volume may be reduced, and the landfill surface may be graded and prepared for capping.

This alternative includes capping the landfill to reduce infiltration from precipitation and to prevent potential exposure to onsite contaminated materials. At a minimum, a multi-media landfill cap that meets the requirements of the Pennsylvania Municipal Solid Waste Regulations will be constructed at the site. In general, the municipal or multi-media cap consists of a soil cover having a topsoil component underlain by a thick soil layer, a drainage layer with a permeability greater than 1×10^{-3} cm/second, a high density polyethylene (HDPE) geomembrane, and a base soil layer over the landfill. The overall thickness of the municipal or multi-media cap is approximately four feet.

Prior to the design and construction of the landfill cap, it will be necessary to collect additional information to ensure that the cap is properly constructed for the site conditions. Upon completing these pre-design or investigatory activities, the information will be reviewed, and incorporated in the design documents for the landfill cap. Pre-design activities will include, at a minimum, the following:

- Survey property lines, landfill extent, surface topography of landfill and surrounding areas, power lines, easements and rights-of-way;
- Determine the contents of the landfill and landfill geotechnical parameters (i.e., moisture content, compactibility);
- Characterize site soils;

- Locate and characterize borrow soil properties; and

- Determine the potential for the landfill to generate methane or other gases, and measure VOC and methane levels in the landfill gas to determine the need for venting.

The information generated during the pre-design activities will be evaluated and incorporated into design documents for use during implementation of the remedy. If available, data to be generated during the focused ground water study for the site will also be considered in designing the landfill cap and surface water runoff control measures.

The landfill cap will be designed to cover an approximate surface area of 5.2 acres. The exact size of the surface area to be capped may be subject to change once the resource recovery action is completed, and the landfill area has been surveyed. The top slopes of the cap will be approximately three percent, minimum, and unbenched side slopes of a maximum of fifteen percent. When the side slopes are greater than 15 percent, a bench may be used for every 25-foot rise in elevation. Both top and side slopes will be vegetated, and gas vents may be installed pending a review of the information collected during the pre-design activities. In addition, surface water control measures will be implemented as part of the landfill cap. A fence will be constructed around the perimeter of the capped area to restrict site access.

This combination of institutional and containment actions is expected to provide both short- and long-term protection of human health and the environment. Long-term management of this alternative includes continued ground water monitoring and periodic inspections of site conditions. Five-year reviews, including an assessment of risks posed by the site, an inspection of the landfill cap's integrity, and an inspection of the integrity of the fence will be required. Limited repair and maintenance activities may be required on the cap and fence.

RAA No. 4 will address the principal threats posed by the site, and provides a permanent solution to the drinking water and landfill problems, as well as the nuisance issues associated with the continued junkyard operation. The extension of an existing water supply to service approximately 49 residential structures impacted by contaminated ground water employs well established

construction techniques and engineering practices. The water line extension is easily implementable, and should be completed within one year, thus providing rapid relief to those individuals who may be exposed to contaminants when bathing or washing with well water. The design and construction of the landfill cap also employs well established engineering and construction techniques, and is easily implementable, with an approximate completion time of 18 to 24 months. The total completion time for this alternative is approximately two years, with a phased approach planned in order to expedite the provision of safe drinking water. This alternative is likely to be consistent with the final, or ground water remedial action for this site.

Remedial Action Alternative No. 5 - Institutional and Containment Actions

This alternative is identical to RAA No. 4, except that bottled water will be provided as a source of potable water rather than extending an existing water supply system. As with alternative number four, the following activities will also be completed: ground water monitoring; fencing; property deed modifications; resource recovery; and capping. These activities are described in greater detail under RAA No. 2 and RAA No. 4.

Alternative number five is somewhat protective of human health; the threats to public health posed by the ingestion of contaminated ground water are addressed. However, the threats posed by the inhalation exposure pathway are not addressed. This alternative is not protective of human health, but was retained due to the community's expression of preference for this method of receiving safe drinking water.

This method of providing safe drinking water to the impacted residences is not preferred by EPA. The bottled water will be an effective remedy only as long as it is implemented. Providing bottled water also is not protective of human health due to the concerns with inhalation of volatile organic contaminants during bathing. Under this alternative, the State would be responsible for delivering bottled water to approximately 44 to 50 residential structures or households for an estimated period of at least 25 years. For this reason, it is not anticipated that the State would concur with this remedy.

Long-term management of this alternative includes continued monitoring of ground water in site and residential wells,

periodic inspections of site conditions, and possible repairs to the fence and landfill cap. Five-year reviews, including an assessment of risks posed by the site will also be required. The total implementation time for this alternative is approximately 18 to 24 months.

IX. COMPARATIVE ANALYSIS OF ALTERNATIVES

The five remedial action alternatives described above were evaluated under the nine evaluation criteria as set forth in the NCP 40 C.F.R. Part 300.430(e)(9) and as described in the "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA, October 1988), EPA Directive 9355.3-02 "Guidance on Preparing Superfund Decision Documents: The Proposed Plan, The Record of Decision, Explanation of Significant Differences, and the Record of Decision Amendment" (EPA/540/G-89/007), July 1989 Interim Final. These nine criteria are organized according to the groups below and can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria.

THRESHOLD CRITERIA

Overall protection of human health and the environment
Compliance with applicable or relevant and appropriate requirements (ARARs)

PRIMARY BALANCING CRITERIA

Reduction of toxicity, mobility, or volume through treatment
Implementability
Short-term effectiveness
Long-term effectiveness
Cost

MODIFYING CRITERIA

Community acceptance
State acceptance

These evaluation criteria relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. Section 9621, which determine the overall feasibility and acceptability of the remedy.

Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between remedies. State and community acceptance are modifying criteria formally taken into account after public comment is received on the Proposed Plan. The evaluations are as follows:

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

A primary requirement of CERCLA is that the selected remedial action be protective of human health and the environment. A remedy is protective if it reduces current and potential risks to acceptable levels under the established risk range posed by each exposure pathway at the site.

Alternative No. 1, No Action, provides no protection for human health or the environment. Alternatives 2 and 3 provide some level of protection for human health and the environment. Alternatives 2 and 3 provide some level of protection for human health by reducing or eliminating potential ingestion of contaminated ground water. Alternative 2 is somewhat more protective than Alternative 3 in this respect because it also eliminates the inhalation exposure pathway through the use of an alternate water supply system as opposed to the use of bottled water for drinking purposes. Both of these alternatives provide a similar level of protection against exposure to onsite contaminated materials with the erection of a fence to limit access.

Alternatives 4 and 5 provide increased protection from on-site contaminated materials by the placement of a cap over the landfill in addition to a fence erected to limit access. Alternative 4 provides the highest level of protection by eliminating the risks posed by all exposure pathways identified for the site.

2) **Compliance with Applicable or Relevant and Appropriate Requirements**

Under Section 121(d) of CERCLA, 42, U.S.C. Section 9621(d), and EPA guidance, remedial actions at CERCLA sites must attain legally applicable or relevant and appropriate Federal and State environmental standards, requirements, criteria, and limitations ("ARARs"). Applicable requirements are those substantive

environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address hazardous material found at the site, the remedial action to be implemented, the location of the site, or other special circumstances. Relevant and appropriate requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law which, while not applicable to the hazardous materials at the site, the remedial action, site location, or other circumstances, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well suited to that site.

The remedy for the first operable unit will comply with all of the ARARs of other Federal and State environmental laws.

3) **Reduction of Toxicity Mobility or Volume**

This evaluation criterion addresses the degree to which a technology or remedial alternative reduces toxicity, mobility, or volume of hazardous substance. Section 121(b) of CERCLA, 42 U.S.C. Section 9621(b), establishes a preference for remedial actions that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances over remedial actions which will not result in such reduction.

Alternatives 1,2, and 3 do not reduce contaminant toxicity, mobility, or volume through treatment. Alternatives 4 and 5 reduce the volume of materials through the implementation of resource recovery activities to remove the bulky items present on the landfill surface. Resource recovery is considered to be physical treatment, and will address debris (appliances, vehicles, tanks, drums) present onsite. Alternatives 4 and 5 will also serve to reduce the mobility of contaminants, not through treatment, but through placing a cap over the landfill. The cap will reduce infiltration through the landfill and will thus reduce the quantity of contaminants that will leach to ground water. Alternatives 4 and 5 will not reduce the toxicity of contaminants that are present in the landfill.

4) **Implementability**

All remedial action alternatives are both technically and administratively feasible. The activities included in each alternative generally use standard construction techniques and are of relatively high reliability.

Alternatives 2 and 4 will require some coordination between state and federal agencies, the Honey Brook Borough Water Authority, Honeybrook Township, and the Chester County Health Department. Administrative issues associated with these alternatives include: cessation of on-site operations, issuance of property deed modifications and restrictions, and abandonment of the residential wells prior to connection to the water supply system.

5) **Short-term Effectiveness**

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

Alternatives 1,2 and 3 will not create additional short-term risks to the community or workers above those identified in the risk section of the ROD. Alternatives 4 and 5 will likely create some acute risks, primarily to onsite workers, which may be controlled by the use of personnel protective equipment.

6) **Long-term Effectiveness and Permanence**

Long-term effectiveness and permanence addresses the long-term protection of human health and the environment once remedial action cleanup goals have been achieved, and focuses on residual risks that will remain after completion of the remedial action. This section will address the long-term effectiveness of the limited scope of action for this ROD: landfill cap, alternate water supply, and institutional controls.

Alternatives 2 and 4 address current risks to human health posed by contaminated ground water. These alternatives provide for an alternate water supply to eliminate both ingestion and

inhalation exposure pathways for contaminated ground water. In contrast, alternatives 3 and 5 do not address the inhalation exposure pathway.

Alternatives 4 and 5 include provision for the construction of a landfill cap, and address current risks associated with exposure to onsite contaminated materials. The containment options (4 and 5) afford a higher degree of permanence than the institutional controls (2 and 3) due to the physical barriers to exposure provided by the cap. Alternatives 2 and 3 include fencing to restrict site access, but these actions will not necessarily provide long-term protection from exposure to on-site contaminated materials.

Long-term management for all remedial alternatives includes continued ground water monitoring with five-year reviews as well as periodic site inspections. Alternatives 2 through 5 will require periodic inspection and repair of the fence. Alternatives 4 and 5 will also require periodic inspection and repair of the landfill cap.

7) Cost

CERCLA requires selection of a cost-effective remedy that protects human health and the environment and meets the other requirements of the Statute. Project costs include all construction and operation and maintenance costs incurred over the life of the project. An analysis of the present worth value of these costs has been completed for each alternative described in this ROD and is summarized in Table ES-1. Capital costs include those expenditures necessary to implement a remedial action.

The costs of the five alternatives range from $1,258,000 to $3,601,000. The degree of protection provided by the alternatives also varies. Comparison of different levels of costs for different levels of protectiveness and permanence of treatment is a primary decision criterion in the cost-effectiveness evaluation.

Alternatives 2 and 4 are the highest in cost, yet offer a higher level of protection by providing a permanent source of safe drinking water to the affected residents. Alternative 4 is

the most costly, and is also the most protective of human health and the environment by providing permanent relief from exposure to contaminated soils and ground water. A detailed breakdown of the costs associated with Alternative 4 is provided in Table H.

The costs for the remedial alternatives are also subject to change based on several influences. All of the alternatives were sensitive to the cost of borrowed capital. Alternatives 1 and 3 were sensitive to the variation in O&M costs. The present values of alternatives 2 and 4 varied significantly with changes in the capital costs associated with the expansion of the existing water supply system. Alternatives 4 and 5 are sensitive to variations in the capital costs associated with capping.

8). Community Acceptance

A public meeting on the Proposed Plan was held on March 27, 1990 in Honey Brook, Pennsylvania. Comments received from the public at that meeting and during the comment period are discussed in the Responsiveness Summary attached to this ROD.

9). State Acceptance

The Commonwealth of Pennsylvania has concurred with this selected Remedial Action.

X. SELECTED REMEDY

Alternative 4: Institutional and Containment Actions- Extend Municipal Water Line, Landfill Cap, Access Controls.

Based on the findings in the RI/FS and the nine criteria listed above, the USEPA has selected Alternative 4. In the judgement of EPA, Alternative 4 represents the best balance among the evaluation criteria and satisfies the statutory requirements of protectiveness, compliance with ARARs, cost effectiveness, and the utilization of permanent solutions and treatment to the maximum extent possible. Alternative 4 is selected as the most appropriate remedy for meeting the goals of the initial operable unit at the Walsh Landfill Site.

This alternative is an operable unit measure to prevent human exposure (i.e., ingestion, inhalation, dermal contact) to

TABLE H

WELSH ROAD/BARKMAN LANDFILL SITE
COST SUMMARY FOR THE SELECTED REMEDY

Cost Component	Cost Estimate
Direct Capital Costs	
1. Groundwater Monitoring	$227,850
2. Expansion of Existing Water Supply System	787,310
3. Fencing	30,750
4. Resource Recovery	13,525
5. Municipal Cap	1,125,600
Total Direct Costs	**$2,185,035**
Indirect Capital Costs	
1. Engineering and Design (7% of Direct Cost)	152,952
2. Contingency Allowance (20% of Direct Cost)	437,007
Total Indirect Costs	**$589,959**
TOTAL CAPITAL COSTS	**$2,774,994**
Operation and Maintenance Costs	
1. Landfill Maintenance and Groundwater Monitoring Around Unit (Years 5, 10, 15, 20 and 25)	$63,090
2. Landfill Maintenance and Groundwater Monitoring Around Unit (Years 2 through 4, 6 through 9, 11 through 14, 16 through 19, and 21 through 24)	108,950
TOTAL COSTS (Net Present Value calculated using a 5% discount value)	**$3,768,000**

contaminated water and soils having concentrations of TCE, chloroform, ethylbenzene, arsenic, lead, mercury, and other constituents in excess of Federal, State, and local health-based ARARs. This alternative will remove the primary risks posed by the site, and will also be consistent with a final remedial action for this site. A summary of each of the major components of this selected remedy is described below:

- The extension of the Honey Brook Borough water supply system will be designed to include the following components. Specific parameters may be subject to change pending completion of design and coordination with local and State agencies.

- Construction of an approximate one mile extension of an eight-inch-diameter mainline along PA State Route 10 to a storage tank located near the top of Welsh Mountain. From the storage tank, 2-inch and 4-inch mainlines will be placed to distribute water by gravity flow to an estimated 50 households. The 50 households include those previously sampled and those presently receiving bottled water. The number and location of residences which will receive public water will be verified during the design of this remedial action.

- Approximately 6500 feet of 8-inch water main, 7500 feet of 4-inch and 3000 feet of 2-inch distribution lines will be installed along PA State Route 10 and Welsh Road. Service lines will be installed for each of the approximately 50 households.

- The current water supply system will be upgraded to provide sufficient capacity to service the impacted residents. This upgrade involves the installation of one water supply well and connection of this well to the current system. A booster pump and 120,000 gallon water storage tank are also included in the required system upgrade.

- Control of the new water lines and services will be transferred to the Honey Brook Borough Water Authority as soon as construction is completed.

- Ground water monitoring data will be collected to monitor the current contaminant levels and possible migration. Wells will be sampled as part of the focused ground water study to be completed for the second operable unit at the site, which is planned to occur in tandem with the water line design. A five year review will also include ground water monitoring of site wells, with analysis for the full list of CLP target parameters.

- At a mininum, a multi-media landfill cap that meets the requirements of the Pennsylvania Municipal Solid Waste Regulations will be designed to contain the contaminated soils and waste materials present at the site. The initial activities include resource recovery, or salvaging of bulky items (cars, appliances, dumpsters, tires) presently placed on top of the landfill, demolition of onsite buildings, and excavation and removal of underground petroleum storage tanks currently used to fuel vehicles used in the junkyard operation. Additional information will be collected in order to properly design the landfill cap, including : survey landfill extent, power lines, easements, and rights-of-way; characterization of the contents of the landfill, its potential to generate methane and other gases, and landfill geotechnical parameters; characterizing site soils; and locating borrow soils with appropriate characteristics. Results and findings from the focused ground water study will also be considered in designing the landfill cap, if available.

- A six-foot high fence topped with either barbed wire or razor ribbon will be constructed around the perimeter of the landfill in order to restrict unauthorized site access and the use of the property for continued or future waste disposal.

- Property deeds for the landfill area will be modified, where appropriate, to indicate the landfill presence, restrict future use and property development, and to restrict use of ground water by placing limitations on the installation of ground water wells.

Cost

The estimated capital and annual operation and maintenance costs for this alternative are summarized below. The present-worth cost estimate is $ 3,768,000 which includes construction of a multi-media landfill cap that at a minimum, meets the requirements of the Pennsylvania municipal solid waste management regulations.

Capital Cost ($ 1,000s)	O&M Cost ($1000s)	Present Worth Cost
2,775	63 (annual) 109 (5-years)	3,768

A more detailed breakdown of costs is presented in Table H.

XI. STATUTORY DETERMINATIONS

The selected remedy which was outlined in Section X satisfies, in part, the remedy selection requirements of CERCLA and the NCP. The remedy provides protection of human health and the environment, achieves compliance with ARARs, utilizes permanent solutions to the maximum extent practicable, and is cost effective. The statutory preference for using treatment as a principal element is not applicable to this operable unit. This requirement will be addressed in the second operable unit which will consider ground water remediation alternatives.

Of the five balancing criteria used in selecting the remedy for the site, the long-term effectivess and permanence factor were found to be the most important during the screening process. Due to the history and continuing status of site operations, and the apparent lack of environmentally sound practices, selection of a permanent source control and alternate water supply remedy was made to ensure protection of human health and the environment.

The selected remedy for the first operable unit will be protective of human health and the environment by reducing the

principal threats posed by the current site situation. By extending the Honey Brook Borough municipal water supply, the affected residents will be offered a permanent source of safe drinking water. The landfill cap and site access controls will prevent contact with contaminants present in site soils and sediments. The cap will also reduce the mobility of contaminants which may flow into site ground water. This action therefore reduces and controls the risks posed by the air pathway (fugitive dust, shower inhalation), the soil pathway (dermal contact and ingestion), and the ground water pathway (ingestion, dermal contact, and inhalation).

The selected remedy provides the highest level of protection utilizing permanent solutions for the position of the site which poses the principal threats to human health and the environment. This remedy is likely to be consistent with the selection of a final, or ground water remedy for the site, and is cost-effective. The resource recovery activities will reduce the volume of contaminated materials and allow for preparation of the landfill surface for capping. The remaining alternatives were quite costly in proportion to their ability to provide protection of public health with regard to the site conditions.

Implementation of the selected remedy should not pose any short-term risks to local residents. The remedy will be designed to include air monitoring around the site perimeter or work area, and measures to limit the generation of dust during the use of heavy equipment. A health and safety plan will be developed to protect onsite workers or visitors from exposure to hazardous substances during implementation of the remedy.

The selected remedy for this operable unit does not satisfy the statutory preference for including treatment that reduces toxicity, mobility, or volume as a principal element. The Feasibility Study evaluated incineration as a remedial alternative for the landfill materials in the initial screening. While incineration is a viable process option, the conditions under which the landfill contents were disposed of (mixed municipal, industrial and construction wastes) may pose severe difficulties to the implementation of incineration as a cleanup alternative. Sorting and separation of the landfill contents prior to incineration of any hazardous substances would pose

extreme safety and health hazards to the onsite workers. In addition, potential health risks may be posed to the local community from generation of fugitive dusts during implementation of incineration activities. For these reasons, as well as consideration of the cost effectiveness of incineration, EPA did not select this treatment option for the landfill wastes. EPA will consider treatment technologies for the contaminated ground water as the second operable unit for the site.

Compliance with ARARs

Applicable or relevant and appropriate requirements (ARARs) pertaining to this remedy will be attained. The selection of this alternative has generated a limited number of ARARs, due to common and accepted engineering and construction practices associated with the installation of water mains and water service connections. These requirements consist of State/local plumbing and fire codes which are to be considered for the installation of water mains, service connections, and fire hydrants. Also, the residences targeted herein, are to be connected to the public water system which must be in compliance with the National Drinking Water Regulations, the Pennsylvania Water Quality Standards, and the requirements of the Chester County Health Department and Honey Brook Borough Water Authority.

The ARARs and other nonpromulgated advisories and guidances issued by Federal, State and local governments (TBCs, or "to-be-considered" items) for the remedial action are discussed below. It should be noted that due to the limited nature of this operable unit, ARARs that apply to ground water cleanup will be addressed in the final ROD for this site.

SDWA Maximum Contaminant Levels (40 CFR Part 141, Subpart B, Sections 141.11(b), 141.12, and 141.61(a))

The substances arsenic, benzene, cadmium, lead, total mercury, trichloroethylene, tetrachloroethylene, and total trihalomethanes have Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs). These substances correspond to the arsenic, benzene, cadmium, lead, mercury, trichloroethylene, tetrachloroethylene, and chloroform detected in samples collected at the site. These MCLs typically apply to public water systems having at least 15 service connections or serving an average of

at least 25-year-round residents as well as to non-transient, non-public water systems regularly serving at least 25 of the same persons over six months per year. Because ground water affected by the site is extracted by the wells of residents and not a community system, the SDWA MCLs are not applicable. However, they are relevant and appropriate requirement as in-situ cleanup levels for ground water that is used for drinking water. The alternatives that include provision of alternate water will comply with the SDWA MCLs. Alternatives 2 and 4 will include the provision of a municipal water supply line, which undergoes routine testing to ensure compliance with MCLs.

Acceptable Intakes Chronic (AICs) and Potency Factors (PFs)

These are TBCs (to-be-considered) requirements that were identified in the Public Health Evaluation Report as providing the best available health standards for indicator chemicals detected at the site. These criteria are detailed in Table D for the contaminants of concern at the site. These standards are the best available to ensure protectiveness of the remedy and compliance with ARARs. Of specific concern at the site is the inhalation pathway for potential exposure to contaminants. Limiting access to the site, as provided in alternatives 2 and 3, will potentially comply with inhalation TBC criteria by reducing the potential for exposure to fugitive dust generation. These alternatives would leave the onsite soils, sediments and solid waste unaddressed, and thus they would remain as a source of fugitive dust generated by the wind.

Alternatives 4 and 5 fully comply with this TBC though capping the contaminant bearing media. These alternatives also comply with the TBC criteria for the dermal contact and incidental ingestion exposure routes, because the landfill cap will prevent contact with the contaminants.

Municipal Waste Management\Landfill Regulations for Pennsylvania
(25 PA Code Chapter 75)

These regulations pertain to the operating and applications requirements for persons and municipalities that operate municipal waste landfills in Pennsylvania. Chapter 75, Sections 75.21 through 75.38 of the Pa. Code of regulations establishes

provisions for the management of municipal and residual waste. These regulations are relevant and appropriate for the site conditions, and may be considered applicable once additional field work has been completed. While Mr. Barkman never received a permit from the State for the operation of a municipal landfill, upon completion of the field tasks required to properly design a landfill cap, we may find that only municipal and construction wastes were disposed of at the site. If so, these requirements will be ARARs, and the landfill cap will be designed to comply with the State's requirements. Based on our knowledge of past site operations, it is assumed that we will find mostly municipal and construction debris within the landfill, and thus this ROD calls for a landfill cap that meets the requirements of the municipal waste management regulations.

Resource Conservation and Recovery Act - (40 CFR Part 264.310(a), 264.117(c), 264.310(b))

The RCRA regulations pertaining to capping and closure with waste in place are considered to be relevant and appropriate for the site conditions. These requirements are applicable if a RCRA hazardous waste was placed at the site after November 8, 1986; or if placement of a hazardous waste occurred in another unit when the waste is being covered for the purpose of leaving it behind after a remedy is completed. The Walsh Landfill operated from 1963 through 1976, and according to the site owner, strictly junkyard activities occurred at the site from approximately 1976 to the present. State and EPA records do not indicate any official closure date for the landfill, and it is assumed that during the history of site operations, a mixture of solid and listed hazardous waste was disposed of on the site. Since the RI/FS did not include sampling of the landfill materials, we presently have no documentation of the presence of RCRA hazardous wastes within the landfill. During the design work required for the landfill cap, sampling of the landfill will be completed. The results of this work will be used to properly design a landfill cap that is appropriate for the site conditions, and the nature of the waste materials found therein. The land disposal restrictions ("land ban") will not be an issue since placement of wastes will not occur with this remedy.

In addition, associated requirements for operation and maintenance (40 CFR 264.310) and Surface Water Control (40 CFR 264 .301(c)(d)) will be relevant and appropriate for the landfill capping action at the site. These requirements may be considered ARARs based on the findings of field investigation work required to properly design the landfill cap.

Underground Storage Tanks: Final Rule (40 CFR Parts 280 and 281, Subpart E, Section 280.52(b), Subpart F, Sections 280.62(a), 280.63(a), and 280.64

The Underground Storage Tank program pertains to the regulation of petroleum and hazardous substance storage tanks, and includes appropriate measures for leak detection, leak prevention, corrective action, and sampling and closure requirements. These requirements will be ARARs for the sampling and removal of the underground petroleum tank present onsite. Due to the presence of a gasoline pump adjacent to the onsite garage, we have assumed that at least one underground petroleum storage tank is present. The pre-design activities associated with the implementation of the selected remedy will include confirming the tank's presence, and sampling the tank contents. All activities associated with the onsite underground petroleum storage tank will be completed in compliance with the UST regulations.

Schedule

The anticipated schedule is for the design to begin in the late summer of 1990. Once the design is completed, a construction period of three to four months will be required for the extension of the water supply lines and service connections to the individual homes. Construction of the landfill cap and the associated resource recovery activities are expected to last from 18 to 24 months.

TABLE ES-1

WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY OF DETAILED EVALUATION OF THE REMEDIAL ACTION ALTERNATIVES

Evaluation Criteria	RAA No. 1	RAA No. 2	RAA No. 3	RAA No. 4	RAA No. 5
Overall Protectiveness of Human Health and the Environment					
Ingestion of Groundwater by Residents	No risk reduction	Protects against existing risk by providing alternate water supply	Partial protection against existing risk by providing bottled water	Protects against existing risk by providing alternate water supply	Partial protection against existing risk by providing bottled water
Ingestion of Groundwater by Future Users	No risk reduction	No protection for future users unless water supply system is expanded	No protection for future users unless bottled water distribution is expanded	Cap will reduce leachate generation; providing some protection to future users	Cap will reduce leachate generation; providing some protection to future users
Protection from Dermal Contact/Inhalation Risks from Groundwater for Residents	No risk reduction	Alternate water supply system protects against existing and potential future risks	Bottled water protects against current risks posed by groundwater ingestion; does not provide protection against inhalation exposure pathway	Alternate water supply system protects against existing and potential future risks	Bottled water protects against current risks posed by groundwater ingestion; does not provide protection against inhalation exposure pathway
Protection from Dermal Contact/Inhalation Risks from Groundwater for Future Residents	No risk reduction	No protection for future users unless water supply system is expanded	No protection for future users	Cap will reduce leachate generation providing some protection. Water supply system expansion will provide additional protection	Cap will reduce leachate generation providing some protection
Protection from Dermal Contact/Ingestion of On-Site Contaminated Materials	No risk reduction	Fence will provide protection only as long as it is maintained	Fence will provide protection only as long as it is maintained	Cap will be protective of human health	Cap will be protective of human health
Protection from Inhalation of On-Site Contaminated Materials	No risk reduction	Fence will restrict vehicle access and reduce dust generation	Fence will restrict vehicle access and reduce dust generation	Cap will be protective of human health by eliminating dust generation	Cap will be protective of human health by eliminating dust generation
Environmental Protection	Allows continued contamination of the groundwater	Allows continued contamination of the groundwater	Allows continued contamination of the groundwater	Reduces leachate generation although continued contaminant migration is allowed	Reduces leachate generation although continued contaminant migration is allowed

TABLE ES-1
(Continued)
WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY OF DETAILED EVALUATION OF THE REMEDIAL ACTION ALTERNATIVES

Evaluation Criteria	RAA No. 1	RAA No. 2	RAA No. 3	RAA No. 4	RAA No. 5
Compliance with ARARs					
Chemical-Specific ARARs	None complied with	Groundwater ARARs regarding human health met; ones regarding groundwater clean-up are not	Groundwater ARARs regarding human health partially met; ones regarding groundwater clean-up are not	Groundwater ARARs regarding human health met; ones regarding groundwater clean-up are partially addressed	Groundwater ARARs regarding human health partially met; ones regarding groundwater clean-up are partially addressed
Location-Specific ARARs	No location-specific ARARs identified	No location-specific ARARs identified	No location-specific ARARs identified	No location-specific ARARs identified	No location-specific ARARs identified
Action-Specific ARARs	No action-specific ARARs identified	No action-specific ARARs identified	No action-specific ARARs identified	State ARARs concerning capping complied with; RCRA ARARs will be complied with pending completion of design	RCRA ARARs concerning capping complied with
TBC Criteria	None complied with	TBCs involving ingestion of contaminants met; those involving inhalation are partially addressed	TBCs involving ingestion of contaminants met; those involving inhalation are partially addressed	TBCs concerning ingestion and inhalation of contaminants are complied with	TBCs involving ingestion of contaminants met; those involving inhalation are partially addressed
Long-Term Effectiveness and Permanence					
Magnitude of Residual Risks Posed by Groundwater	Existing risk will remain	Current risk reduced or eliminated - potential future risk possible	Current risk due to ingestion is reduced; risks due to inhalation are not reduced - potential future risk due to dermal contact or inhalation is possible	Current risk is reduced or eliminated. Cap reduces potential future risk	Current risk due to ingestion is reduced; risks due to inhalation are not reduced. Cap reduces potential future risk although future risk due to dermal contact or inhalation is possible
Magnitude of Residual Risk Posed by On-Site Material	Existing risk will remain	Current risk is reduced, potential future risk is controlled only if fence is maintained	Current risk is reduced, potential future risk is controlled only if fence is maintained	Current risk is eliminated. Future risk is reduced if cap is maintained, although waste will remain on site	Current risk is eliminated. Future risk is reduced if cap is maintained, although waste will remain on site

TABLE ES-1
(Continued)
WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY OF DETAILED EVALUATION OF THE REMEDIAL ACTION ALTERNATIVES

Evaluation Criteria	RAA No. 1	RAA No. 2	RAA No. 3	RAA No. 4	RAA No. 5
Adequacy and Reliability of Controls	No controls considered	Alternate water supply is effective in controlling risk from groundwater; fence is of limited effectiveness	Bottled water is effective in reducing risk from groundwater ingestion, but not inhalation; fence is of limited effectiveness	Alternate water supply is effective in controlling risk from groundwater. Cap is effective in controlling risk from on-site material	Bottled water supply is effective in reducing risk from groundwater ingestion, but not inhalation. Cap is effective in controlling risk from on-site material
Five Year Reviews	Five year reviews are required	Five year reviews are required	Five year reviews are required	Five year reviews are required	Five year reviews are required
Reduction of Toxicity, Mobility, or Volume Through Treatment					
Treatment	None used	None used	None used	None used	None used
Residuals from Treatment	None	None	None	None	None
Statutory Preference for Treatment	Not satisfied	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Short-Term Effectiveness					
Community Protection	Risks remain unchanged	Community protected from contaminated groundwater; on-site materials remain undisturbed	Community protected from contaminated groundwater ingestion, although potential threats posed by groundwater due to inhalation are still present; on-site materials remain undisturbed	Community protected from contaminated groundwater; on-site materials remain undisturbed	Community protected from contaminated groundwater ingestion, although potential threats posed by groundwater due to inhalation are still present; on-site materials remain undisturbed
Worker Protection	No significant risk to workers	No significant risk to workers	No significant risk to workers	Worker protection required during cap construction	Worker protection required during cap construction

TABLE ES-1
(Continued)
WELSH ROAD/BARKMAN LANDFILL SITE
SUMMARY OF DETAILED EVALUATION OF THE REMEDIAL ACTION ALTERNATIVES

Evaluation Criteria	RAA No. 1	RAA No. 2	RAA No. 3	RAA No. 4	RAA No. 5
Implementability					
Ability to Construct and Operate	No construction or operation	Conventional construction and operation	Conventional construction and operation	Conventional construction and operation	Conventional construction and operation
Ability to Monitor Effectiveness	Groundwater will be monitored	Monitoring will provide indication of an increase in groundwater contamination	Monitoring will provide indication of an increase in groundwater contamination	Monitoring will provide indication of an increase in groundwater contamination	Monitoring will provide indication of an increase in groundwater contamination
Approvals, Permits, Coordination	None necessary	Coordination with Honey Brook Borough Water Authority and Chester County Health Department likely to be necessary	None necessary	Coordination with Honey Brook Borough Water Authority and Chester County Health Department likely to be necessary	None necessary
State Acceptance	State acceptance to be addressed in the ROD	State acceptance to be addressed in the ROD	State acceptance to be addressed in the ROD	State acceptance to be addressed in the ROD	State acceptance to be addressed in the ROD
Community Acceptance	Community acceptance to be addressed in the ROD	Community acceptance to be addressed in the ROD	Community acceptance to be addressed in the ROD	Community acceptance to be addressed in the ROD	Community acceptance to be addressed in the ROD
Estimated Time for Implementation of Design and Construction Phases	--	1 year	0.5 years	2 to 2.5 years	1.5 to 2 years
Cost ($)*					
Capital Cost	289,000	1,328,000	328,000	2,775,000	2,312,000
Annual Operation and Maintenance Cost	32,000	57,000	50,000	63,000	55,000
Operation and Maintenance Cost During Five-Year Reviews	228,000	103,000	245,000	109,000	251,000
Present Worth Cost	1,258,000	2,242,000	1,538,000	3,768,000	3,601,000
Worst-Case Present Value	1,886,000	3,026,000	2,208,000	4,970,000	4,623,000
Best-Case Present Value	825,000	1,865,000	992,000	3,180,000	3,002,000

* All costs are rounded to the nearest $1,000.00.

APPENDIX B
EPA Risk Tables
for the Welsh Road Site

TABLE 1

WELSH ROAD LANDFILL

RESIDENITAL WELL INORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

CONTAMINANT	BARKMAN	BANNON	HOFFMAN	MANSER	SAMUELS	SHANKS	SHORES	STAGGS
ARSENIC	6.16E-05	1.01E-04	6.16E-05	6.58E-05	7.40E-05	4.73E-05	7.81E-05	9.45E-05
BERYLLIUM	6.56E-05	N/A	N/A	N/A	N/A	6.06E-05	N\A	N\A
TOTAL CARCINOGENIC RISK	1.27E-04	1.01E-04	6.16E-05	6.58E-05	7.40E-05	1.08E-04	7.81E-05	9.45E-05

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	BARKMAN	BANNON	HOFFMAN	MANSER	SAMUELS	SHANKS	SHORES	STAGGS
ARSENIC	2.88E-05	4.70E-05	2.88E-05	3.07E-05	3.45E-05	2.21E-05	3.64E-05	4.41E-05
BERYLLIUM	3.06E-05	N/A	N/A	N/A	N/A	2.83E-05	N\A	N\A
TOTAL CARCINOGENIC RISK	5.94E-05	4.70E-05	2.88E-05	3.07E-05	3.45E-05	5.04E-05	3.64E-05	4.41E-05

TABLE 2

WELSH ROAD LANDFILL

RESIDENITAL WELL INORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

CONTAMINANT	BANNON	BARKMAN	BLOSENSKI	BROWN	GRUBB	HAYES	HOFFMAN	MANSER	SAMUELS	SHANKS	SHORES	STAGGS	STOLTZFUS, L.
ANTIMONY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.74E+00	N/A	N/A	N/A	N/A
ARSENIC	4.47E-01	2.74E-01	N/A	N/A	N/A	N/A	2.74E-01	2.92E-01	3.29E-01	2.10E-01	3.47E-01	4.20E-01	N/A
BERYLLIUM	N/A	7.12E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.58E-03	N\A	N\A	N/A
COBALT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.34E-03
COPPER	1.41E+00	1.85E-01	N/A	N/A	N/A	N/A	N/A	3.46E-01	N/A	N/A	N/A	N/A	N/A
MANGANESE	4.18E-01	1.69E+00	7.29E-01	1.77E-01	1.53E+00	N/A	6.19E+00	5.94E-01	1.06E+00	1.63E+00	N/A	N/A	1.80E+00
MERCURY	N/A	N/A	N/A	N/A	N/A	2.10E-01	N/A	N/A	N/A	2.37E-01	N/A	N/A	1.28E-01
TOTAL HAZARD INDEX	2.16E+00	2.28E+00	7.29E-01	1.77E-01	1.53E+00	2.10E-01	6.46E+00	1.23E+00	5.13E+00	2.08E+00	3.47E-01	4.20E-01	1.93E+00

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	BANNON	BARKMAN	BLOSENSKI	BROWN	GRUBB	HAYES	HOFFMAN	MANSER	SAMUELS	SHANKS	SHORES	STAGGS	STOLTZFUS, L.
ANTIMONY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.73E+00	N/A	N/A	N/A	N/A
ARSENIC	1.04E+00	6.39E-01	N/A	N/A	N/A	N/A	6.39E-01	6.28E-01	7.67E-01	4.90E-01	8.10E-01	9.80E-01	N/A
BERYLLIUM	N/A	1.66E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.53E-02	N\A	N\A	N/A
COBALT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.38E-03
COPPER	3.29E+00	4.32E-01	N/A	N/A	N/A	N/A	N/A	8.08E-01	N/A	N/A	N/A	N/A	N/A
MANGANESE	9.76E-01	3.95E+00	1.70E+00	4.13E-01	3.57E+00	N/A	1.44E+01	1.39E+00	2.48E+00	3.80E+00	N/A	N/A	4.21E+00
MERCURY	N/A	N/A	N/A	N/A	N/A	4.90E-01	N/A	N/A	N/A	5.54E-01	N/A	N/A	2.98E-01
TOTAL HAZARD INDEX	5.04E+00	5.31E+00	1.70E+00	4.13E-01	3.57E+00	4.90E-01	1.50E+01	2.83E+00	1.20E+01	4.86E+00	8.10E-01	9.80E-01	4.52E+00

TABLE 3

WELSH ROAD LANDFILL

RESIDENITAL WELL ORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	3.41E-07	6.81E-07	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	1.31E-05	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	4.23E-06	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	6.90E-06	N/A
HEXACHLOROBUTADIENE	N/A	1.83E-07	N/A	N/A	N/A	1.83E-07
TETRACHLOROETHYLENE	1.83E-06	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	8.92E-05	N/A	N/A
CARCINOGENIC RISK	1.83E-06	1.83E-07	3.41E-07	8.99E-05	2.42E-05	1.83E-07

INHALATION DURING SHOWERING

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	5.23E-07	1.05E-06	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	7.08E-05	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	1.79E-07	N/A	N/A	N/A	1.79E-07
TETRACHLOROETHYLENE	8.45E-08	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	2.39E-05	N/A	N/A
CARCINOGENIC RISK	8.45E-08	1.79E-07	5.23E-07	2.50E-05	7.08E-05	1.79E-07
TOTAL COMBINED CARCINOGENIC RISK	1.91E-06	3.62E-07	8.64E-07	1.15E-04	9.50E-05	3.62E-07

TABLE 4

WELSH ROAD LANDFILL

RESIDENITAL WELL ORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	1.59E-07	3.18E-07	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	1.31E-05	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	4.23E-06	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	6.90E-06	N/A
HEXACHLOROBUTADIENE	N/A	8.55E-08	N/A	N/A	N/A	8.55E-08
TETRACHLOROETHYLENE	8.55E-07	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	4.16E-05	N/A	N/A
CARCINOGENIC RISK	8.55E-07	8.55E-08	1.59E-07	4.19E-05	2.42E-05	8.55E-08

DERMAL CONTACT

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	3.78E-08	7.55E-08	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	7.08E-05	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	2.44E-08	N/A	N/A	N/A	2.44E-08
TETRACHLOROETHYLENE	8.12E-07	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	7.22E-07	N/A	N/A
CARCINOGENIC RISK	8.12E-07	2.44E-08	3.78E-08	7.98E-07	7.08E-05	2.44E-08
TOTAL COMBINED CARCINOGENIC RISK	1.67E-06	1.10E-07	1.97E-07	4.27E-05	9.50E-05	1.10E-07

TABLE 5

WELSH ROAD LANDFILL

RESIDENITAL WELL ORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	N/A	N/A	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	2.47E-02	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	2.45E-04
CHLOROFORM	N/A	N/A	N/A	N/A	1.62E-01	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	9.56E-03	N/A
HEXACHLOROBUTADIENE	N/A	2.74E-03	N/A	N/A	N/A	2.74E-03
TETRACHLOROETHYLENE	8.22E-03	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	N/A	N/A	N/A
HAZARD INDEX	8.22E-03	2.74E-03	0.00E+00	0.00E+00	1.96E-01	2.99E-03

INHALATION DURING SHOWERING

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	2.93E-01	5.87E-01	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	N/A	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	N/A	N/A	N/A	N/A	N/A
TETRACHLOROETHYLENE	1.82E-02	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	N/A	N/A	N/A
HAZARD INDEX	1.82E-02	0.00E+00	2.93E-01	5.87E-01	0.00E+00	0.00E+00
TOTAL COMBINED HAZARD INDEX	2.64E-02	2.74E-03	2.93E-01	5.87E-01	1.96E-01	2.99E-03

TABLE 6

WELSH ROAD LANDFILL

RESIDENITAL WELL ORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - CURRENT AND FUTURE USE

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	N/A	N/A	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	5.75E-02	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	5.71E-04
CHLOROFORM	N/A	N/A	N/A	N/A	3.77E-01	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	2.24E-02	N/A
HEXACHLOROBUTADIENE	N/A	6.39E-03	N/A	N/A	N/A	6.39E-03
TETRACHLOROETHYLENE	1.92E-02	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	N/A	N/A	N/A
HAZARD INDEX	1.92E-02	6.39E-03	0.00E+00	0.00E+00	4.57E-01	6.96E-03

DERMAL CONTACT

CONTAMINANT	BEACHY	GRUBB	HOFFMAN	SAMUELS	STAGGS	STOLTZFUS,D.
BENZENE	N/A	N/A	N/A	N/A	N/A	N/A
BROMODICHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
CHLOROFORM	N/A	N/A	N/A	N/A	8.96E-02	N/A
DIBROMOCHLOROMETHANE	N/A	N/A	N/A	N/A	N/A	N/A
HEXACHLOROBUTADIENE	N/A	1.82E-03	N/A	N/A	N/A	1.82E-03
TETRACHLOROETHYLENE	1.82E-02	N/A	N/A	N/A	N/A	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A	N/A	N/A	N/A
VINYL CHLORIDE	N/A	N/A	N/A	N/A	N/A	N/A
HAZARD INDEX	1.82E-02	1.82E-03	0.00E+00	0.00E+00	8.96E-02	1.82E-03
TOTAL COMBINED HAZARD INDEX	3.74E-02	8.21E-03	0.00E+00	0.00E+00	5.47E-01	8.78E-03

TABLE 7

WELSH ROAD LANDFILL

MONITORING WELL INORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - LOG NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	RISK
ARSENIC	5.81E-03	6.82E-05	1.19E-04
BARIUM	6.54E-01	7.68E-03	N/A
CADMIUM	2.63E-03	3.09E-05	N/A
COBALT	1.13E-01	1.32E-03	N/A
MANGANESE	2.26E+01	2.65E-01	N/A
MERCURY	7.20E-04	8.45E-06	N/A
CARCINOGENIC RISK			1.19E-04

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	RISK
ARSENIC	5.81E-03	3.18E-05	5.57E-05
BARIUM	6.54E-01	3.58E-03	N/A
CADMIUM	2.63E-03	1.44E-05	N/A
COBALT	1.13E-01	6.19E-04	N/A
MANGANESE	2.26E+01	1.24E-01	N/A
MERCURY	7.20E-04	3.95E-06	N/A
CARCINOGENIC RISK			5.57E-05

TABLE 8

WELSH ROAD LANDFILL

MONITORING WELL INORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - LOG NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	HI
ARSENIC	5.81E-03	1.59E-04	5.31E-01
BARIUM	6.54E-01	1.79E-02	2.56E-01
CADMIUM	2.63E-03	7.21E-05	1.44E-01
COBALT	1.13E-01	3.09E-03	1.71E-02
MANGANESE	2.26E+01	6.19E-01	1.24E+02
MERCURY	7.20E-04	1.97E-05	6.58E-02
HAZARD INDEX			1.25E+02

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	HI
ARSENIC	5.81E-03	3.71E-04	1.24E+00
BARIUM	6.54E-01	4.18E-02	5.97E-01
CADMIUM	2.63E-03	1.68E-04	3.36E-01
COBALT	1.13E-01	7.22E-03	1.20E-01
MANGANESE	2.26E+01	1.44E+00	2.89E+02
MERCURY	7.20E-04	4.60E-05	1.53E-01
HAZARD INDEX			2.91E+02

TABLE 9

WELSH ROAD LANDFILL

MONITORING WELL ORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - LOG NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	RISK
BENZENE	7.56E-03	8.88E-05	2.57E-06
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	1.72E-04	2.41E-06
n-BUTYLBENZENE	8.00E-04	9.39E-06	N/A
sec-BUTYLBENZENE	4.00E-04	4.70E-06	N/A
tert-BUTYLBENZENE	2.00E-04	2.35E-06	N/A
CARBON DISULFIDE	2.10E-03	2.47E-05	N/A
CHLOROBENZENE	1.69E-03	1.98E-05	N/A
1,4-DICHLOROBENZENE	5.61E-03	6.59E-05	1.58E-06
DICHLORODIFLUOROMETHANE	1.26E-02	1.47E-04	N/A
1,1-DICHLOROETHYLENE	6.80E-04	7.98E-06	4.79E-06
1,2-DICHLOROPROPANE	7.00E-04	8.22E-06	5.59E-07
ETHYLBENZENE	2.91E-02	3.42E-04	N/A
BETA- HCCH	4.00E-05	4.70E-07	8.45E-07
GAMMA-HCCH	5.00E-05	5.87E-07	7.63E-07
HEXACHLOROBUTADIENE	8.96E-03	1.05E-04	8.21E-06
p-ISOPROPYLTOLUENE	3.10E-03	3.64E-05	N/A
2-METHYLNAPHTHALENE	1.00E-03	1.17E-05	N/A
4-METHYL-2-PENTANONE	3.62E-03	4.25E-05	N/A
NITORBENZENE	6.00E-04	7.05E-06	N/A
n-PROPYLBENZENE	2.97E-03	3.49E-05	N/A
TETRACHLOROETHYLENE	1.60E-03	1.88E-05	9.77E-07
TOLUENE	5.25E-03	6.16E-05	N/A
1,2,3-TRICHLOROBENZENE	2.90E-03	3.41E-05	N/A
1,2,4-TRICHLOROBENZENE	2.00E-03	2.35E-05	N/A
TRICHLOROFLUOROMETHANE	3.44E-03	4.04E-05	N/A
1,2,4-TRIMETHYLBENZENE	6.37E-03	7.48E-05	N/A
1,3,5-TRIMETHYLBENZENE	4.00E-03	4.70E-05	N/A
m,p-XYLENES	5.04E-02	5.91E-04	N/A
CARCINOGENIC RISK			2.27E-05

INHALATION DURING SHOWERING

CONTAMINANT	CONC. (mg/m3)	ADI (mg/kg/d)	RISK
BENZENE	1.39E-01	1.36E-04	3.95E-06
BIS(2-ETHYLHEYL)PHTHALATE	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A
sec-BUTYLBENZENE	N/A	N/A	N/A
tert-BUTYLBENZENE	N/A	N/A	N/A
CARBON DISULFIDE	3.96E-02	3.87E-05	N/A
CHLOROBENZENE	2.66E-02	2.61E-05	N/A
1,4-DICHLOROBENZENE	7.87E-02	7.70E-05	N/A
DICHLORODIFLUOROMETHANE	N/A	N/A	N/A
1,1-DICHLOROETHYLENE	1.18E-02	1.16E-05	2.03E-06
1,2-DICHLOROPROPANE	1.07E-02	1.05E-05	N/A
ETHYLBENZENE	4.80E-01	4.70E-04	N/A
BETA- HCCH	9.60E-07	9.39E-10	1.69E-09
GAMMA-HCCH	2.04E-05	1.99E-08	N/A
HEXACHLOROBUTADIENE	1.07E-01	1.04E-04	8.03E-06
p-ISOPROPYLTOLUENE	N/A	N/A	N/A
2-METHYLNAPHTHALENE	N/A	N/A	N/A
4-METHYL-2-PENTANONE	N/A	N/A	N/A
NITORBENZENE	N/A	N/A	N/A
PROPYLBENZENE	N/A	N/A	N/A

TETRACHLOROETHYLENE	2.27E-02	2.22E-05	4.50E-08
TOLUENE	9.11E-02	8.92E-05	N/A
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A
1,2,4-TRICHLOROBENZENE	2.54E-02	2.49E-05	N/A
TRICHLOROFLUOROMETHANE	N/A	N/A	N/A
1,2,4-TRIMETHYLBENZENE	N/A	N/A	N/A
1,3,5-TRIMETHYLBENZENE	N/A	N/A	N/A
m,p-XYLENES	8.32E-01	8.14E-04	N/A

CARCINOGENIC RISK	1.41E-05
TOTAL COMBINED CARCINOGENIC RISK	3.68E-05

TABLE 10

WELSH ROAD LANDFILL

MONITORING WELL ORGANICS - CARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	RISK
BENZENE	7.56E-03	4.14E-05	1.20E-06
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	8.04E-05	1.13E-06
n-BUTYLBENZENE	8.00E-04	4.38E-06	N/A
sec-BUTYLBENZENE	4.00E-04	2.19E-06	N/A
tert-BUTYLBENZENE	2.00E-04	1.10E-06	N/A
CARBON DISULFIDE	2.10E-03	1.15E-05	N/A
CHLOROBENZENE	1.69E-03	9.26E-06	N/A
1,4-DICHLOROBENZENE	5.61E-03	3.07E-05	7.38E-07
DICHLORODIFLUOROMETHANE	1.26E-02	6.88E-05	N/A
1,1-DICHLOROETHYLENE	6.80E-04	3.73E-06	2.24E-06
1,2-DICHLOROPROPANE	7.00E-04	3.84E-06	2.61E-07
ETHYLBENZENE	2.91E-02	1.60E-04	N/A
BETA- HCCH	4.00E-05	2.19E-07	3.95E-07
GAMMA-HCCH	5.00E-05	2.74E-07	3.56E-07
HEXACHLOROBUTADIENE	8.96E-03	4.91E-05	3.83E-06
p-ISOPROPYLTOLUENE	3.10E-03	1.70E-05	N/A
2-METHYLNAPHTHALENE	1.00E-03	5.48E-06	N/A
4-METHYL-2-PENTANONE	3.62E-03	1.98E-05	N/A
NITORBENZENE	6.00E-04	3.29E-06	N/A
n-PROPYLBENZENE	2.97E-03	1.63E-05	N/A
TETRACHLOROETHYLENE	1.60E-03	8.77E-06	4.56E-07
TOLUENE	5.25E-03	2.88E-05	N/A
1,2,3-TRICHLOROBENZENE	2.90E-03	1.59E-05	N/A
1,2,4-TRICHLOROBENZENE	2.00E-03	1.10E-05	N/A
TRICHLOROFLUOROMETHANE	3.44E-03	1.88E-05	N/A
1,2,4-TRIMETHYLBENZENE	6.37E-03	3.49E-05	N/A
1,3,5-TRIMETHYLBENZENE	4.00E-03	2.19E-05	N/A
m,p-XYLENES	5.04E-02	2.76E-04	N/A
CARCINOGENIC RISK			1.06E-05

DERMAL CONTACT

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	RISK
BENZENE	7.56E-03	9.84E-06	2.85E-07
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	N/A	N/A
n-BUTYLBENZENE	8.00E-04	N/A	N/A
sec-BUTYLBENZENE	4.00E-04	N/A	N/A
tert-BUTYLBENZENE	2.00E-04	N/A	N/A
CARBON DISULFIDE	2.10E-03	1.37E-05	N/A
CHLOROBENZENE	1.69E-03	9.02E-07	N/A
1,4-DICHLOROBENZENE	5.61E-03	4.53E-06	1.09E-07
DICHLORODIFLUOROMETHANE	1.26E-02	1.96E-06	N/A
1,1-DICHLOROETHYLENE	6.80E-04	1.42E-07	8.50E-08
1,2-DICHLOROPROPANE	7.00E-04	9.11E-08	6.20E-09
ETHYLBENZENE	2.91E-02	3.79E-04	N/A
BETA- HCCH	4.00E-05	7.29E-09	1.31E-08
GAMMA-HCCH	5.00E-05	9.11E-09	1.18E-08
HEXACHLOROBUTADIENE	8.96E-03	1.40E-05	1.09E-06
p-ISOPROPYLTOLUENE	3.10E-03	N/A	N/A
2-METHYLNAPHTHALENE	1.00E-03	N/A	N/A
4-METHYL-2-PENTANONE	3.62E-03	1.56E-07	N/A
NITORBENZENE	6.00E-04	N/A	N/A
-PROPYLBENZENE	2.97E-03	N/A	N/A

TETRACHLOROETHYLENE	1.60E-03	8.33E-06	4.33E-07
TOLUENE	5.25E-03	6.84E-05	N/A
1,2,3-TRICHLOROBENZENE	2.90E-03	N/A	N/A
1,2,4-TRICHLOROBENZENE	2.00E-03	2.60E-06	N/A
TRICHLOROFLUOROMETHANE	3.44E-03	7.61E-07	N/A
1,2,4-TRIMETHYLBENZENE	6.37E-03	N/A	N/A
1,3,5-TRIMETHYLBENZENE	4.00E-03	N/A	N/A
m,p-XYLENES	5.04E-02	5.24E-05	N/A

CARCINOGENIC RISK	2.03E-06
TOTAL COMBINED CARCINOGENIC RISK	1.26E-05

TABLE 11

WELSH ROAD LANDFILL

MONITORING WELL ORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

ADULT RESIDENTIAL USE

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - LOG NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	HI
BENZENE	7.56E-03	2.07E-04	N/A
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	4.02E-04	2.01E-02
n-BUTYLBENZENE	8.00E-04	2.19E-05	9.78E-04
sec-BUTYLBENZENE	4.00E-04	1.10E-05	1.10E-03
tert-BUTYLBENZENE	2.00E-04	5.48E-06	5.48E-04
CARBON DISULFIDE	2.10E-03	5.75E-05	5.75E-04
CHLOROBENZENE	1.69E-03	4.63E-05	2.32E-03
1,4-DICHLOROBENZENE	5.61E-03	1.54E-04	N/A
DICHLORODIFLUOROMETHANE	1.26E-02	3.44E-04	1.72E-03
1,1-DICHLOROETHYLENE	6.80E-04	1.86E-05	2.07E-03
1,2-DICHLOROPROPANE	7.00E-04	1.92E-05	N/A
ETHYLBENZENE	2.91E-02	7.98E-04	7.98E-03
BETA- HCCH	4.00E-05	1.10E-06	N/A
GAMMA-HCCH	5.00E-05	1.37E-06	4.57E-03
HEXACHLOROBUTADIENE	8.96E-03	2.45E-04	1.23E-01
p-ISOPROPYLTOLUENE	3.10E-03	8.49E-05	2.12E-03
2-METHYLNAPHTHALENE	1.00E-03	2.74E-05	6.85E-04
4-METHYL-2-PENTANONE	3.62E-03	9.92E-05	2.48E-03
NITORBENZENE	6.00E-04	1.64E-05	3.29E-02
n-PROPYLBENZENE	2.97E-03	8.14E-05	1.35E-03
TETRACHLOROETHYLENE	1.60E-03	4.38E-05	4.38E-03
TOLUENE	5.25E-03	1.44E-04	7.19E-04
1,2,3-TRICHLOROBENZENE	2.90E-03	7.95E-05	1.04E-02
1,2,4-TRICHLOROBENZENE	2.00E-03	5.48E-05	5.48E-03
TRICHLOROFLUOROMETHANE	3.44E-03	9.42E-05	3.14E-04
1,2,4-TRIMETHYLBENZENE	6.37E-03	1.75E-04	3.49E-01
1,3,5-TRIMETHYLBENZENE	4.00E-03	1.10E-04	2.74E-01
m,p-XYLENES	5.04E-02	1.38E-03	6.90E-04
HAZARD INDEX			8.49E-01

INHALATION DURING SHOWERING

CONTAMINANT	CONC. (mg/m3)	ADI (mg/kg/d)	HI
BENZENE	1.39E-01	3.17E-04	2.22E+00
BIS(2-ETHYLHEYL)PHTHALATE	N/A	N/A	N/A
n-BUTYLBENZENE	N/A	N/A	N/A
sec-BUTYLBENZENE	N/A	N/A	N/A
tert-BUTYLBENZENE	N/A	N/A	N/A
CARBON DISULFIDE	3.96E-02	9.03E-05	3.16E-02
CHLOROBENZENE	2.66E-02	6.08E-05	1.07E-02
1,4-DICHLOROBENZENE	7.87E-02	1.80E-04	7.85E-04
DICHLORODIFLUOROMETHANE	N/A	N/A	N/A
1,1-DICHLOROETHYLENE	1.18E-02	2.70E-05	N/A
1,2-DICHLOROPROPANE	1.07E-02	2.45E-05	2.15E-02
ETHYLBENZENE	4.80E-01	1.10E-03	3.83E-03
BETA- HCCH	9.60E-07	2.19E-09	N/A
GAMMA-HCCH	2.04E-05	4.65E-08	N/A
HEXACHLOROBUTADIENE	1.07E-01	2.43E-04	N/A
p-ISOPROPYLTOLUENE	N/A	N/A	N/A
2-METHYLNAPHTHALENE	N/A	N/A	N/A
4-METHYL-2-PENTANONE	N/A	N/A	N/A
NITORBENZENE	N/A	N/A	N/A
n-PROPYLBENZENE	N/A	N/A	N/A

TETRACHLOROETHYLENE	2.27E-02	5.18E-05	N/A
TOLUENE	9.11E-02	2.08E-04	1.83E-03
1,2,3-TRICHLOROBENZENE	N/A	N/A	N/A
1,2,4-TRICHLOROBENZENE	2.54E-02	5.80E-05	2.26E-02
TRICHLOROFLUOROMETHANE	N/A	N/A	N/A
1,2,4-TRIMETHYLBENZENE	N/A	N/A	N/A
1,3,5-TRIMETHYLBENZENE	N/A	N/A	N/A
m,p-XYLENES	8.32E-01	1.90E-03	2.22E-02

HAZARD INDEX	2.34E+00
TOTAL COMBINED HAZARD INDEX	3.18E+00

TABLE 12

WELSH ROAD LANDFILL

MONITORING WELL ORGANICS - NONCARCINOGENIC RISK

RESIDENTIAL USE SCENARIO - FUTURE USE

RESIDENTIAL USE BY CHILDREN

INGESTION OF GROUNDWATER

ALL MONITORING WELLS - LOG NORMAL DISTRIBUTION

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	HI
BENZENE	7.56E-03	4.83E-04	N/A
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	9.38E-04	4.69E-02
n-BUTYLBENZENE	8.00E-04	5.11E-05	2.28E-03
sec-BUTYLBENZENE	4.00E-04	2.56E-05	2.56E-03
tert-BUTYLBENZENE	2.00E-04	1.28E-05	1.28E-03
CARBON DISULFIDE	2.10E-03	1.34E-04	1.34E-03
CHLOROBENZENE	1.69E-03	1.08E-04	5.40E-03
1,4-DICHLOROBENZENE	5.61E-03	3.59E-04	N/A
DICHLORODIFLUOROMETHANE	1.26E-02	8.03E-04	4.01E-03
1,1-DICHLOROETHYLENE	6.80E-04	4.35E-05	4.83E-03
1,2-DICHLOROPROPANE	7.00E-04	4.47E-05	N/A
ETHYLBENZENE	2.91E-02	1.86E-03	1.86E-02
BETA- HCCH	4.00E-05	2.56E-06	N/A
GAMMA-HCCH	5.00E-05	3.20E-06	1.07E-02
HEXACHLOROBUTADIENE	8.96E-03	5.73E-04	2.86E-01
p-ISOPROPYLTOLUENE	3.10E-03	1.98E-04	4.95E-03
2-METHYLNAPHTHALENE	1.00E-03	6.39E-05	1.60E-03
4-METHYL-2-PENTANONE	3.62E-03	2.31E-04	5.79E-03
NITORBENZENE	6.00E-04	3.84E-05	7.67E-02
n-PROPYLBENZENE	2.97E-03	1.90E-04	3.14E-03
TETRACHLOROETHYLENE	1.60E-03	1.02E-04	1.02E-02
TOLUENE	5.25E-03	3.36E-04	1.68E-03
1,2,3-TRICHLOROBENZENE	2.90E-03	1.85E-04	2.44E-02
1,2,4-TRICHLOROBENZENE	2.00E-03	1.28E-04	1.28E-02
TRICHLOROFLUOROMETHANE	3.44E-03	2.20E-04	7.33E-04
1,2,4-TRIMETHYLBENZENE	6.37E-03	4.07E-04	8.14E-01
1,3,5-TRIMETHYLBENZENE	4.00E-03	2.56E-04	6.39E-01
m,p-XYLENES	5.04E-02	3.22E-03	1.61E-03
HAZARD INDEX			1.98E+00

DERMAL CONTACT

CONTAMINANT	CONC. (mg/L)	ADI (mg/kg/d)	HI
BENZENE	7.56E-03	1.15E-04	N/A
BIS(2-ETHYLHEYL)PHTHALATE	1.47E-02	N/A	N/A
n-BUTYLBENZENE	8.00E-04	N/A	N/A
sec-BUTYLBENZENE	4.00E-04	N/A	N/A
tert-BUTYLBENZENE	2.00E-04	N/A	N/A
CARBON DISULFIDE	2.10E-03	1.59E-04	1.59E-03
CHLOROBENZENE	1.69E-03	1.05E-05	5.26E-04
1,4-DICHLOROBENZENE	5.61E-03	5.28E-05	N/A
DICHLORODIFLUOROMETHANE	1.26E-02	2.29E-05	1.14E-04
1,1-DICHLOROETHYLENE	6.80E-04	1.65E-06	1.84E-04
1,2-DICHLOROPROPANE	7.00E-04	1.06E-06	N/A
ETHYLBENZENE	2.91E-02	4.42E-03	4.42E-02
BETA- HCCH	4.00E-05	8.51E-08	N/A
GAMMA-HCCH	5.00E-05	1.06E-07	3.54E-04
HEXACHLOROBUTADIENE	8.96E-03	1.63E-04	8.17E-02
p-ISOPROPYLTOLUENE	3.10E-03	N/A	N/A
2-METHYLNAPHTHALENE	1.00E-03	N/A	N/A
4-METHYL-2-PENTANONE	3.62E-03	1.81E-06	4.54E-05
NITORBENZENE	6.00E-04	N/A	N/A
n-PROPYLBENZENE	2.97E-03	N/A	N/A

TETRACHLOROETHYLENE	1.60E-03	9.72E-05	9.72E-03
TOLUENE	5.25E-03	7.97E-04	3.99E-03
1,2,3-TRICHLOROBENZENE	2.90E-03	N/A	N/A
1,2,4-TRICHLOROBENZENE	2.00E-03	3.04E-05	3.04E-03
TRICHLOROFLUOROMETHANE	3.44E-03	8.88E-06	2.96E-05
1,2,4-TRIMETHYLBENZENE	6.37E-03	N/A	N/A
1,3,5-TRIMETHYLBENZENE	4.00E-03	N/A	N/A
m,p-XYLENES	5.04E-02	6.12E-04	3.06E-04
HAZARD INDEX			1.46E-01
TOTAL COMBINED HAZARD INDEX			2.13E+00

APPENDIX C
Summary of Sampling Data from the Remedial Investigation
for the Welsh Road Site

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-1	RES-GW-4	RES-GW-5	RES-GW-6	RES-GW-7	RES-GW-8	RES-GW-9	RES-GW-11	RES-GW-13	RES-GW-14	RES-GW-16	RES-GW-17
Date Sampled	12/7/87	12/11/87	12/8/87	12/9/87	12/11/87	12/8/87	12/11/87	12/8/87	12/17/87	12/10/87	12/11/87	12/11/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB1	FB4	TB2,FB2	FB3	FB4	TB2,FB2	FB4	TB2,FB2	NONE	FB3	FB4	FB4
VOLATILE ORGANICS (ppb)												
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	1 J	3 JB	5 U	2 J	1 JB	5 U	2 JB	5 U	5 U	5 U	10	2 JB
ACETONE	10 U	10 U	10 U	5 JB	10 U	36	10 U	64 B	10 U	10 U	57 B	5 J
CARBON DISULFIDE	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	18	10 U
1,1,1-TRICHLOROETHANE	5 U	1 J	5 U	5 U	5 U	5 U	2 J	5 U	5 U	5 U	3 J	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	1 J	5 U	4 J	2 J	5 U	5 U	5 U	5 U	5	5	1 J	31
ETHYLBENZENE	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J
TOTAL XYLENES	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)												
DI-N-BUTYPHTHALATE	20 U	96	20 U	20 U	30	20 U	140	20 U	20 U	250	90	28
FLOURANTHENE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
PESTICIDES/PCB'S (ppb)												
NONE DETECTED												
METALS (ppb)												
ALUMINUM	194 J	132 J	72 J	73 J	2190	58 J	83 J	106 J	204	200 U	46 J	78 J
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U
ARSENIC	10 U	10 U	8.3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BARIUM	41 J	38 J	22 J	71 J	214	5.7 J	23 J	20 J	26.2 J	14 J	65 J	59 J
BERYLLIUM	5 U	2.8 J	5 U	5 U	5 U	1.8 J	5 U	5 U	5 U	5 U	5 U	5 U
CADMIUM	5 U	22 B	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	15 B
CALCIUM	11400	9400	9730	16500	9460	253 J	754 J	2960 J	5066	1160 J	63 J	7530
CHROMIUM	20	19	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COBALT	50 U	24 J	50 U	50 U	4.8 J	50 U	50 U	50 U	50 U	50 U	3.6 J	50 U
COPPER	14 J	30	25 U	37	136	24 J	88	91	23.2 J	19 J	39	12 J
IRON	5470	1960	1230	302	2120	410	87 J	107	815	3510	465	83230
LEAD	27.7	5 U	5 U	5 U	7.5	5 U	5.2	5.1	5 U	5 U	11.5	5 U
MAGNESIUM	5830	3590 J	4040 J	3370 J	3200 J	154 J	536 J	1860 J	1966 J	305 J	564 J	3640 J
MANGANESE	306	29	7.3 J	34	58	5.6 J	8.8 J	7.6 J	33.2	21	56	320
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	5.3	0.2 U
NICKEL	40 U	22 J	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
POTASSIUM	4610 J	3780 J	4220 J	4520 J	3830 J	362 J	1560 J	2420 J	3162 J	114 J	1970 J	1690 J
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
SILVER	10 U	6.7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SODIUM	7020	4840 J	5620	4660 J	11450	24200	2450 J	4490 J	2975 J	1950 J	4640 J	11480
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
VANADIUM	50 U	23 J	6.9 J	7.8 J	4.8 J	7.5 J	50 U	8.5 J	11.3 J	50 U	50 U	50 U
ZINC	16 J	114	25	8.2 J	50	12 J	25	48	13.9 J	33	14 J	11 J
CYANIDE	10 U	10 U	10 U	10 U	10 U		10 U	10 U	10 U	10 U	10 U	10 U
PHENOL	5 U	5 U	24	13	5 U		5 U	15	5 U	5 U	5 U	5 U

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RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-1	RES-GW-4	RES-GW-5	RES-GW-6	RES-GW-7	RES-GW-8	RES-GW-9	RES-GW-11	RES-GW-13	RES-GW-14	RES-GW-16	RES-GW-17
Date Sampled	12/7/87	12/11/87	12/8/87	12/9/87	12/11/87	12/8/87	12/11/87	12/8/87	12/17/87	12/10/87	12/11/87	12/11/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB1	FB4	TB2,FB2	FB3	FB4	TB2,FB2	FB4	TB2,FB2	NONE	FB3	FB4	FB4
TENTATIVELY IDENTIFIED COMPOUNDS												
Volatiles (ppb)												
DICHLOROFLUOROMETHANE	23	U	24	U	U	U	U	U	U	U	U	15
TRICHLOROFLUOROMETHANE	17	U	U	U	U	U	U	U	U	U	U	U
TRIMETHYL SILANOL	U	U	U	U	U	U	U	U	U	U	U	U
1,2-DICHLORO-1,1,2,2-TETRAFLUORO	U	U	U	U	U	U	U	U	U	U	U	8
PENTANE	U	U	U	U	U	U	U	U	U	U	U	U
Base Neutral/Acid Extractables (ppb)												
DIOCTYLESTER-HEXENOIC ACID	U	U	U	U	U	U	U	U	U	U	U	U
3,3,5-TRIMETHYL-CYCLOHEXANONE	U	U	U	U	U	U	U	U	U	U	U	66
3,3,5-TRIMETHYL-CYCLOHEXANOL	U	U	U	U	U	U	U	U	U	U	U	U
3-NITRO-1,2-BENZENEDICARBOXYLIC ACID	U	U	U	U	U	32	U	15	11	U	U	U
CYCLOHEXANE	U	U	U	U	U	U	U	U	U	U	U	U
METHYL BENZENE	U	U	U	U	U	U	U	U	U	U	U	U
BROMO-CYCLOHEXANE	U	U	9	U	U	U	U	U	U	U	U	U
TETRAHYDROFURAN	U	U	U	U	U	9	U	U	U	U	U	U

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-18	RES-GW-19	RES-GW-21	RES-GW-22	RES-GW-23	RES-GW-24	RES-GW-25	RES-GW-26	RES-GW-27	RES-GW-28	RES-GW-29	RES-GW-30
Date Sampled	12/11/87	12/10/87	12/7/87	12/17/87	12/10/87	12/9/87	12/11/87	12/9/87	12/10/87	12/9/87	12/10/87	12/10/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB4	FB3	FB1	NONE	FB3	FB3	FB4	FB3	FB3	FB3	FB3	FB3
VOLATILE ORGANICS (ppb)												
CHLOROMETHANE	10 U	10 U	10 U	10 U	24	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	5 U	5 U	5 U	1 J	5	2 J	5 U	2 J	5 U	5 U	16	5 U
ACETONE	76 B	67 B	5 JB	10 U	12	10 U	27 B	6 JB	10 U	8 JB	36	10 U
CARBON DISULFIDE	5 U	5 U	23	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	9	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROFORM	14	5 U	5 U	5 U	87	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	11	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZENE	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	29	11	5 U	5 U	1 J	5 U	4 J	5 U	6	2 J	1 J	1 J
ETHYLBENZENE	18	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOTAL XYLENES	20	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)												
DI-N-BUTYPHTHALATE	26	24	20 U	20 U	42	20 U	240	20 U	150	20 U	68	22
FLOURANTHENE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
PESTICIDES/PCB'S (ppb)												
NONE DETECTED												
METALS (ppb)												
ALUMINUM	113 J	200 U	766	765	200 U	123 J	119 J	256	200 U	537	200 U	217
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BARIUM	276	118 J	213	197 J	31 J	63 J	150 J	181 J	104 J	310	21 J	218
BERYLLIUM	5 U	5 U	1.6 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CADMIUM	22 B	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CALCIUM	19940	1030 J	4790 J	4662	1160 J	1260 J	4880 J	4740	5000 U	4250	12270	3250 J
CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COBALT	51	5.7 J	50 U	3.5 J	3.1 J	50 U	4.6 J	3.7 J	6.1 J	3.4 J	3.4 J	9 J
COPPER	22 J	19 J	217	114	97	637	73	10 J	185	127	25 U	233
IRON	129200	485	455	418	3940	569	68 J	5990	418	87 J	902	162
LEAD	19.4	11	14.1	5 U	24.5	19.5	9.2	13.7	10.2	6.4	5 U	9.3
MAGNESIUM	11050	1810 J	5470	6846	1270 J	1950 J	2320 J	5970	1970 J	5080	2250 J	4530 J
MANGANESE	7340	71	139	242	56	39	275	61	39	90	70	303
MERCURY	0.2 U	0.2 U	0.2 U	3.9	0.2 U	0.2 U	0.2 U	1.6	3.2	2.8	0.2 U	2.7
NICKEL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
POTASSIUM	2430 J	5000 U	2480 J	3252	141 J	1330 J	735 J	2290	205 J	3410 J	1510 J	3030 J
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
SILVER	10 U	4.5	10 U	4.3 J	4.5 J	10 U	10 U	10 U	4.1 J	10 U	4.3 J	10 U
SODIUM	30540	6090	8980	10600	134600	3120 J	1720 J	30230	6530	33020	2200 J	29330
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
VANADIUM	50 U	50 U	5.9	11.8 J	50 U	8 J	50 U	6.5 J	50 U	6.8	50 U	50 U
ZINC	49	105	133	13.3 J	321	34	28	56	6.8 J	48	20 U	23
CYANIDE	10 U	10 U	10 U	10 U	10 U	[illegible]	10 U	10 U	10 U	10 U	10 U	10 U
PHENOL	5 U	5 U	5 U	5 U	5 U	[illegible]	5 U	19	5 U	5 U	5 U	5 U

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
KELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-18	RES-GW-19	RES-GW-21	RES-GW-22	RES-GW-23	RES-GW-24	RES-GW-25	RES-GW-26	RES-GW-27	RES-GW-28	RES-GW-29	RES-GW-30
Date Sampled	12/11/87	12/10/87	12/7/87	12/17/87	12/10/87	12/9/87	12/11/87	12/9/87	12/10/87	12/9/87	12/16/87	12/10/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB4	FB3	FB1	NONE	FB3	FB3	FB4	FB3	FB3	FB3	FB3	FB3
TENTATIVELY IDENTIFIED COMPOUNDS												
Volatiles (ppb)												
DICHLOROFLUOROMETHANE	16	U	U	U	U	U	U	U	U	U	U	U
TRICHLOROFLUOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U
TRIMETHYL SILANOL	U	U	U	U	U	U	U	U	U	U	U	U
1,2-DICHLORO-1,1,2,2-TETRAFLUO	11	U	U	U	U	U	U	U	U	U	U	U
PENTANE	U	U	U	U	U	U	U	U	U	U	U	U
Base Neutral/Acid Extractables (ppb)												
DIOCTYLESTER-HEXENOIC ACID	U	U	U	U	U	U	U	U	U	U	U	U
3,3,5-TRIMETHYL-CYCLOHEXANONE	U	U	U	U	U	U	U	U	U	U	U	U
3,3,5-TRIMETHYL-CYCLOHEXANOL	U	U	U	U	U	U	U	U	U	U	U	U
3-NITRO-1,2-BENZENEDICARBOXYLIC ACID	U	U	U	U	U	U	U	U	U	U	U	U
CYCLOHEXANE	U	U	U	U	U	U	U	U	U	U	U	U
METHYL BENZENE	U	U	U	U	U	U	U	U	U	U	U	U
BROMO-CYCLOHEXANE	U	U	U	U	U	U	U	U	U	U	U	U
TETRAHYDROFURAN	U	U	U	U	U	U	U	U	U	U	U	U

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-31	RES-GW-33	RES-GW-35	RES-GW-36	RES-DUP	RES-DUP	FIELD BLK(1)	FIELD BLK(2)	FIELD BLK(3)	FIELD BLK(4)	TRIP BLK(2)
Date Sampled	12/17/87	12/10/87	12/10/87	12/10/87	12/8/87	12/11/87	12/7/87	12/8/87	12/10/87	12/11/87	12/8/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	---	---	---	---	---
Associated Blank Number	NONE	FB3	FB3	FB3	TB2,FB2	FB4	---	---	---	---	---
VOLATILE ORGANICS (ppb)											
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	5 U	5 U	6	2 JB	5 U	3 JB	16	5 U	280 B	14	5 U
ACETONE	10 U	44 B	53 B	10 U	10 U	10 U	3 JB	24	10 U	18	10 U
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	9	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	10	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	5 U	5 U	3 J	5 U	5 U	5 U	5 U	5 U	1 J	5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U	6	2 J	2 J	5 U	10	5 U	5 U	2 J	3 J	5 U
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U	6	5 U	5 U	5 U	5 U	5 U
TOTAL XYLENES	5 U	5 U	5 U	5 U	5 U	19	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)											
DI-N-BUTYPHTHALATE	20 U	52	20 U	22	20 U	20 U	20 U	20 U	20 U	20 U	NOT
FLOURANTHENE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	210	ANALYZED
PESTICIDES/PCB'S (ppb)											
NONE DETECTED											
METALS (ppb)											
ALUMINUM	341	435	200 U	200 U	87 J	217	118 J	148 J	200 U	200 U	NOT
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	ANALYZED
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
BARIUM	122 J	311	42 J	13 J	68 J	301	200 U	200 U	200 U	200 U	
BERYLLIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
CADMIUM	5 U	5 U	5 U	5 U	5 U	24 B	5 U	4.4 J	5 U	5 U	
CALCIUM	9423	2200 J	5000 U	5000 U	646 J	17600	180 J	289 J	5000 U	5000 U	
CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	19	10 U	10 U	10 U	
COBALT	3.8 J	8 J	50 U	5.8 J	50 U	58	50 U	50 U	50 U	50 U	
COPPER	44.5	47	264	49	64	135	25 U	25 U	25 U	25 U	
IRON	125	271	246	849	226	140800	71 J	290	5 J	100 U	
LEAD	5 U	11.7	5 U	5 U	12	5 U	14.5	5 U	5 U	5 U	
MAGNESIUM	5557	5240	59 J	5000 U	829 J	11910	71 J	130	5000 U	5000 U	
MANGANESE	131	54	3.9 J	2.5 J	34	7980	2.3 J	7 J	50	15 U	
MERCURY	1.5	8.2	0.2 U	0.2 U	0.2 U	0.5	0.2 U	0.2 U	0.2 U	0.2 U	
NICKEL	40 U	40 U	40 U	40 U	9.7 J	40 U	40 U	40 U	40 U	40 U	
POTASSIUM	2729 J	2650 J	5000 U	5000 U	2320 J	2600 J	191 J	219 J	5000 U	5000 U	
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
SILVER	10 U	10 U	10 U	5.5 J	10 U	10 U	10 U	10 U	10 U	10 U	
SODIUM	25280	38490	6360	165 J	4820 J	33200	690 J	519 J	310 J	5000 U	
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
VANADIUM	12.1 J	50 U	50 U	50 U	3.9 J	50 U	4.5 J	5.5 J	50 U	50 U	
ZINC	12.8 J	15 J	14 J	12 J	45	34	6.5 J	20 U	2.7 J	20 U	
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
PHENOL	5 U	5 U	5 U	5 U	13	U	5 U	12	5 U	5 U	

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-31	RES-GW-33	RES-GW-35	RES-GW-36	RES-DUP	RES-DUP	FIELD BLK(1)	FIELD BLK(2)	FIELD BLK(3)	FIELD BLK(4)	TRIP BLK(2)
Date Sampled	12/17/87	12/10/87	12/10/87	12/10/87	12/8/87	12/11/87	12/7/87	12/8/87	12/10/87	12/11/87	12/8/87
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	---	---	---	---	---
Associated Blank Number	NONE	FB3	FB3	FB3	TB2,FB2	FB4	---	---	---	---	---
TENTATIVELY IDENTIFIED COMPOUNDS											
Volatiles (ppb)											
DICHLOROFLUOROMETHANE	U	U	U	U	43	U	U	U	U	U	U
TRICHLOROFLUOROMETHANE	U	U	U	U	U	U	U	U	U	U	U
TRIMETHYL SILANOL	U	U	10	U	U	U	U	U	U	U	U
1,2-DICHLORO-1,1,2,2-TETRAFLUORO	U	U	U	U	U	U	U	U	U	U	U
PENTANE	U	U	U	U	28	U	U	U	U	U	U
Base Neutral/Acid Extractables (ppb)											
DIOCTYLESTER-HEXENOIC ACID	U	U	U	U	U	U	U	U	U	U	NOT
3,3,5-TRIMETHYL-CYCLOHEXANONE	U	U	U	U	136	U	U	U	U	U	ANALYZED
3,3,5-TRIMETHYL-CYCLOHEXANOL	U	U	U	U	42	U	U	U	U	U	
3-NITRO-1,2-BENZENEDICARBOXYLI	51	U	U	U	U	U	7	U	U	U	
CYCLOHEXANE	U	U	U	U	U	U	76	U	U	U	
METHYL BENZENE	U	U	U	U	U	U	U	U	U	U	
BROMO-CYCLOHEXANE	U	U	U	U	U	8	U	U	U	U	
TETRAHYDROFURAN	U	U	U	U	U	U	U	U	U	U	

MONITORING WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	MW-1-GW	MW-2-GW	MW-3-GW	MW-4-GW	MW-5-GW	MW-6-GW	DER 01	DER 01-DUP	SMW-4-GW	SMW-6-GW	RIN-BA(3)	RIN-PU(4)	FIELD BLK(5)	TRIP BLK(3)
Date Sampled	2/16/88	2/16/88	2/17/88	2/18/88	2/18/88	2/15/88	2/17/88	2/17/88	2/18/88	2/15/88	2/19/88	2/19/88	2/19/88	2/15/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	—	—	—	—
Associated Blank Number	RIN384,FBS	RIN384,FBS	RIN384,FBS	RIN384,FBS	RIN384,FBS	ALL IN FILE	RIN384,FBS	RIN384,FBS	RIN384,FBS	783	—	—	—	—
VOLATILE ORGANICS (ppb)														
CHLOROETHANE	10 U	10 U	17	1 J	1000 U	10 U	10 U	10 U	5 J	10 U	500 U	10 U	10 U	10 U
METHYLENE CHLORIDE	1 JB	5 U	2 JB	17	1500	1 JB	1 JB	1 JB	5 U	1 JB	150 JB	2 JB	9 B	1 JB
ACETONE	14	10 U	30	110 B	6300 B	17 B	33 B	35 B	210 B	80 B	10000 B	14 B	8 JB	19 B
CARBON DISULFIDE	5 U	5 U	5 U	5 U	500 U	5 U	5 U	5 U	5 U	5 U	1000	5 U	1 J	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	1 J	500 U	5 U	5 U	5 U	5 U	5 U	250 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U	10 U	3 J	1000 U	10 U	10 U	10 U	10 U	10 U	250 U	5 U	5 U	10 U
TRICHLOROETHENE	6	4 J	20	11	500 U	6	4 J	4 J	2 J	1 J	250 U	4 J	5 U	5 U
BENZENE	5 U	5 U	5 J	1 J	500 U	5 U	5 U	5 U	2 J	5 U	250 U	5 U	5 U	5 U
2-HEXANONE	10 U	10 U	10 U	10 U	600 J	10 U	10 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	500 U	2 J	5 U	5 U	5 U	2 J	250 U	1 J	5 U	5 U
TOLUENE	5 U	2 J	6	5	100 J	2 J	2 J	2 J	5 U	5 U	850	1 J	2 J	5 U
ETHYLBENZENE	5 U	5 U	24	2 J	500 U	5 U	5 U	5 U	10	1 J	250 U	5 U	5 U	5 U
TOTAL XYLENES	5 U	5 U	35	6	500 U	5 U	5 U	5 U	7	5 U	250 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)														
ISOPHORONE	20 U	20 U	4 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	NOT
NAPHTHALENE	20 U	20 U	10 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	ANALYZED
DI-N-BUTYPHTHALATE	20 U	20 U	20 U	2 J	20 U	6 J	20 U	20 U	20 U	4 J	20 U	20 U	20 U	
PYRENE	20 U	20 U	20 U	4 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	
BIS(2-ETHYHEXYL) PHTHALATE	12 J	16 J	18 J	20	36	26	38	36	12 J	18 J	20	28	18 J	
PESTICIDES/PCB'S (ppb)														
NONE DETECTED														
METALS (ppb)														
ALUMINUM	1990 J	978 J	180 J	112 J	516	583	1690 J	1440 J	21500	69100	193 J	412	99.9 J	NOT
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	ANALYZED
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	29.4	34	10 U	10 U	10 U	
BARIUM	182 J	156 J	2020	418	308	88.7 J	208	197 J	394	703	200 U	4.4 J	200 U	
BERYLLIM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.5 J	5 U	5 U	5 U	
CADMIUM	5 U	5 U	4.5 J	5 U	19.9	5 U	5 U	5 U	20.2	3.2 J	5 U	5 U	5 U	
CALCIUM	3910	3560	79000	13700	14300	6920	34000	30200	26800	9700	132 J	139 J	5000 U	
CHROMIUM	10 U	10 U	10 U	4.7 J	4.3 J	4.3 J	10 U	10 U	48.7	20.8	10 U	10 U	10 U	
COBALT	7.4 J	8.2 J	140	23 J	35.7 J	50 U	12.7 J	12.6 J	36.3 J	36.4 J	50 U	50 U	50 U	
COPPER	13.9 J	15.6 J	85 U	25 U	25 U	12.2 J	26	20.9 J	25.3	31.1 J	862	383	25 U	
IRON	3300 J	459 J	136000 J	1270	161000	606	1660 J	811 J	141000	102000	126 B	460	67.1 JB	
LEAD	5 U	5 U	5 U	5 U	5.4	12.8 J	5	5 U	16	45.4 J	30.6 J	35.4 J	5 UJ	
MAGNESIUM	6330	2500 J	36900	5230	8570	2460 J	4470 J	4440 J	11800	11300	66.1 J	81.7 J	5000 U	
MANGANESE	186 J	202 J	2920 J	2910	1200	76.4 J	1090 J	1080 J	6140	1970 J	3.5 J	11.4 J	15 U	
MERCURY	2.1 J	0.2 UJ	0.8 J	0.2 U	0.2 U	0.2 U	1.1 J	0.6 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	
NICKEL	40 U	40 U	40 U	40 U	40 U	40 U	13.6 J	40 U	21 J	17.6 J	40 U	40 U	40 U	
POTASSIUM	9570	1300 JB	20400	112000	5360	6560	8880	9220	11400	30900	300 J	421 J	233 J	
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
SILVER	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	
SODIUM	15400	4060 J	96200	69400	38600	9300	9320	9010	29800	7450	496 JB	121 JB	68.6 JB	
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
VANADIUM	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	30.7 J	30.2 J	50 U	50 U	50 U	
ZINC	17.9 J	44.3 B	19.2 JB	14.1 JB	66.5 B	36.2 B	12	125	70.5 B	427	1570	357	4.3 JB	
	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ		10 UJ	10 U	10 UJ	10 U	10 U	10 U	
	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	

AR301837

MONITORING WELL SAMPLES - SAMPLING ROUND 1
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	MW-1-GW	MW-2-GW	MW-3-GW	MW-4-GW	MW-5-GW	MW-6-GW	DER 01	DER 01-DUP	GWW-4-GW	SGW-6-GW	RIN-6413)	RIN-RU(4)	FIELD BLK(5)	TRIP BLK(3)	
Date Sampled	2/16/88	2/16/88	2/17/88	2/18/88	2/16/88	2/15/88	2/17/88	2/17/88	2/18/88	2/15/88	2/19/88	2/19/88	2/19/88	2/15/88	
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	—	—	—	—	
Associated Blank Number	RIN384,FBS	RIN384,FBS	RIN384,FBS	RIN384,FBS	RIN384,FBS	ALL IN FILE	RIN384,FBS	RIN384,FBS	RIN384,FBS	763	—	—	—	—	
TENTATIVELY IDENTIFIED COMPOUNDS															
Volatiles (ppb)															
DICHLOROFLUOROMETHANE	U	U	U	88	U	U	U	U	241	U	U	U	U	NOT	
TRIMETHYL SILANOL	U	U	U	U	51	U	U	U	U	U	U	U	U	ANALYZED	
DIBROMOMETHANE	U	U	U	U	U	U	U	U	U	U	2443	U	U		
CARBON DIOXIDE	U	U	U	U	U	U	U	U	118	U	U	U	U		
Base neutral/Acid Extractables (ppb)															
DICHLOROMETHANE	U	U	U	U	U	14	U	U	374	U	U	U	U	NOT	
5-METHYL-2-HEXANONE	U	U	U	676	62	19	U	U	340	16	91	U	U	ANALYZED	
DIOCTYLESTERHEXANEDIOC ACID	U	U	U	U	U	U	U	U	U	U	U	9	U		
METHYL BENZENE	U	U	U	U	U	U	U	U	U	17	U	U	U		
FURAN	U	U	U	U	U	U	U	U	102	U	U	U	U		

AR301838

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RIFS INVESTIGATION

Sample Location	RES-GW-1	RES-GW-4	RES-GW-6	RES-GW-7	RES-GW-8	RES-GW-9	RES-GW-12	RES-GW-13	RES-GW-14	RES-GW-16	RES-GW-17	RES-GW-18	RES-GW-19
Date Sampled	2/24/88	2/26/88	2/23/88	2/24/88	2/24/88	2/24/88	2/24/88	2/24/88	2/19/88	2/19/88	2/19/88	2/19/88	2/19/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB6	TB5	TB4	FB6	FB6	FB6	FB6	FB6	FB5	FB5	FB5	FB5	FB5
VOLATILE ORGANICS (ppb)													
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4 J	10 U	10 U
METHYLENE CHLORIDE	5 U	3 JB	5 U	3 JB	5 U	5 U	5 U	5 U	2 JB	2 J	2 JB	2 JB	2 JB
ACETONE	10 U	10 JB	10 U	10 U	10 U	10 U	10 U	10 U	29 B	10 U	5 JB	17 B	12 B
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	4 J	1 J	5 U
TRANS-1,2-DICHLOROETHENE	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J	1 J	5 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	8	5 U	5 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4 J	10 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J	5 U	5 U	5 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 J	1 J	5 U
TETRACHLOROETHENE	5 U	3 J	5 U	5 U	5 U	5 U	5 U	5 U	1 J	2 J	5 U	1 J	1 J
TOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J	2 J	4 J	38	2 J
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10	2 J	5 U
TOTAL XYLENES	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20	5	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)													
DIETHYLPHTHALATE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	2 J	20 U
DI-N-BUTYLPHTHALATE	20 U	2 J	20 U	2 J	2 J	20 U	2 J	2 J	2 J	2 J	20 U	2 J	20 U
BIS(2-ETHYHEXYL)PHTHALATE	4 J	16 J	82	100	74	2 J	50	26	30	150	170	38	24
PESTICIDES/PCB'S (ppb)													
NONE DETECTED													
METALS (ppb)													
ALUMINUM	200 U	200 U	200 U	144 J	200 U	200 U	200 U	200 U	200 U	200 U	126 J	95.2 J	307
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BARIUM	73.4 J	18.4 J	56.8 J	201	3.9 U	17.6 J	16.3 J	20.7 J	17.3 J	73.4 J	303 J	62.6 J	129 J
BERYLLIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.1 J	5 U	5 U
CADMIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CALCIUM	13400	9320	12300	10200	54 U	1070 J	2970 J	4620 J	2270 J	574 J	7860	2290 J	3090 J
CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COBALT	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	55.5	50 U	3.6 J
COPPER	71.4	21.9 J	148	97.5	15.8 J	81.4	78.3	23 J	25 U	58.1	25 U	25 U	10.6 J
IRON	57.9 JB	1900	197 B	259	322	124 B	96.4 JB	331	3260	380	137000	71400	255
LEAD	5 U	5 U	5 U	33.2 J	5 U	5 U	5 U	5 U	5 UJ	12.5	13.2	5 UJ	7.8 J
MAGNESIUM	5180	3450 J	2540 J	3480 J	38 U	609 J	1710 J	1750 J	939 J	797 J	11600	4030 J	4300 J
MANGANESE	2.6 J	9.8 J	20.3 J	44.3 J	7.3 J	8.8 J	5.1 J	29.9 J	17.5 J	53.8 J	7710 J	180 J	68.5 J
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
POTASSIUM	8410 J	3720 J	3700 J	3640 J	467 JB	1580 JB	8230 J	2600 J	1860 J	2850 J	3610	8220 J	2400 J
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
SILVER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SODIUM	6560	5060	4780 J	12700	40500	2000 J	4150 J	2770 J	2490 J	5070	32400	11800	9360
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U
VANADIUM	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
ZINC	43.4	185	754	87.2	47.9	51.4	132	91.4	7.8 J	23.4	15.8	34.6	312
CYANIDE	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 U
PHENOL	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
ORGANIC ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	RES-GW-1	RES-GW-4	RES-GW-6	RES-GW-7	RES-GW-8	RES-GW-9	RES-GW-12	RES-GW-13	RES-GW-14	RES-GW-16	RES-GW-17	RES-GW-18	RES-GW-19
Date Sampled	2/24/88	2/26/88	2/23/88	2/24/88	2/24/88	2/24/88	2/24/88	2/24/88	2/19/88	2/17/88	2/19/88	2/17/88	2/19/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER
Associated Blank Number	FB6	TB5	TB4	FB6	FB6	FB6	FB6	FB6	FB5	FB5	FB5	FB5	FB5
TENTATIVELY IDENTIFIED COMPOUNDS													
Volatiles (ppb)													
1,2-DICHLORO-1,1,2,3-TETRAFLUOROETHANE	U	U	U	U	U	U	U	U	U	U	U	U	97
2-METHYLPROPANE	U	U	U	U	U	U	U	U	U	U	U	U	38
TRICHLOROFLUOROMETHANE	U	127	U	U	U	U	U	U	U	13	U	U	U
DICHLOROFLUOROMETHANE	U	97	U	U	U	U	U	U	U	U	24	U	U
PENTANE	U	U	U	U	U	U	U	U	U	U	49	U	U
DIMETHOXYMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U
Base neutral/Acid Extractables (ppb)													
5-METHYL-2-HEXANONE	U	U	789	107	120	U	113	U	U	80	158	U	U
2-HEPTANONE	U	U	U	U	U	U	U	U	U	U	37	U	U
BIS(2-ETHYLHEXYL)ESTERHEXANEDIOIC ACID	U	U	U	U	U	U	U	U	U	U	96	U	U
DIOCTYLESTERHEXANEDIOICACID	U	U	U	U	U	U	U	U	U	U	U	U	U
1,3,5-CYCLOHEPTATRIENE	U	U	U	U	U	U	U	U	U	U	U	247	U
1,3 DIOXEPIN-4,7-DIHYDRO	U	U	U	U	U	U	U	U	U	U	U	U	U
1-PROPENE	U	U	U	U	U	U	U	U	U	U	U	U	U
TRICHLOROETHENE	1467	U	U	U	U	U	U	U	U	U	U	U	U
CYCLOHEXENE	U	U	U	U	U	U	U	1208	U	U	U	U	U
4-PENTEN-2-OL	U	U	U	U	U	U	U	369	U	U	U	U	U
2-PENTEN-2-OL	U	U	U	U	U	U	U	U	U	U	U	U	U
2-PROPENYLESTER ACETIC ACID	U	U	U	U	U	U	U	U	U	U	U	U	U

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RIVFS INVESTIGATION

Sample Location	RES-GW-21	RES-GW-22	RES-GW-23	RES-GW-24	RES-GW-26	RES-GW-27	RES-GW-28	RES-GW-30	RES-GW-36	RES-GW-37	RES-GW-39	RES-GW-40	TRIP BLK(4)
Date Sampled	2/24/88	2/23/88	2/22/88	2/23/88	2/24/88	2/22/88	2/26/88	2/26/88	2/22/88	2/22/88	2/26/88	2/24/88	2/23/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	---
Associated Blank Number	FB6	TB4	FB5	TB5	FB6	FB5	TB5	TB5	FB5	FB5	TB5	FB6	---
VOLATILE ORGANICS (ppb)													
CHLOROMETHANE	10 U	10 U	5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	5 U	5 U	2 J	5 U	5 U	5 U	3 JB	3 JB	2 JB	5 U	5 U	5 U	5 U
ACETONE	10 U	10 U	10 U	10 U	10 U	10 U	7 JB	9 JB	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROFORM	5 U	5 U	36	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	5 U	5 U	2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZENE	5 U	5 U	2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	1 J	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOTAL XYLENES	5 U	5 U	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)													
DIETHYLPHTHALATE	20 U	2 J	4 J	20 U	20 U	20 U	2 J	20 U	20 U	20 U	20 U	20 U	NOT
DI-N-BUTYLPHTHALATE	20 U	6 J	2 J	4 J	20 U	20 U	2 J	10 J	20 U	20 U	2 J	20 U	ANALYZED
BIS(2-ETHYHEXYL)PHTHALATE	4 J	96	38	92	94	62	12 J	14 J	190	120	68	6 J	
PESTICIDES/PCB'S (ppb)													
NONE DETECTED													
METALS (ppb)													
ALUMINUM	787	571	150 J	45.3 J	79.3 J	154 J	549	311	47.1 J	2700	160 J	1180	NOT
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	ANALYZED
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
BARIUM	77 B	190 B	251	97.9 B	158 B	126 B	282	206	17.2 B	114 B	158 B	142 B	
BERYLLIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.6 J	5 U	5 U	
CADMIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
CALCIUM	5400	4660 B	16400	2160 B	4550 B	1400	5040	4460 B	2230 B	1390 B	1270	7280	
CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
COBALT	4.7 B	50 U	3.9 J	50 U	50 U	5.2 J	4.5 J	6.5 J	50 U	7.9 J	50 U	7.8 J	
COPPER	100	17.4 B	8.5 U	780	8.5 U	172	160	1380	63.2	71.8	59	315	
IRON	830	660	112000	557	11700	110	94 B	139 B	930	18.2 B	268	85.2 B	
LEAD	5 U	5 U	5 U	5 U	5 U	5 U	7 J	6.8 J	14.3	5 U	5 U	5.8 J	
MAGNESIUM	5800	6420	8690	3120 B	6470	4280 B	5080	5020	822 B	936 B	2560	5140	
MANGANESE	141 J	232 J	1515 J	82.7 J	83 J	52.9 J	126 J	271 J	17.4 J	275 J	31.6 JB	264 J	
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	2.8	0.5	0.8	0.2 U	0.2 U	0.2 U	0.2 U	
NICKEL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	
POTASSIUM	2220 B	3120 B	3810 B	1290 B	1880 B	2450 B	3300 B	3180 B	2560 B	1440 B	3220 B	1210 B	
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
SILVER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
SODIUM	11300	11300	57200	5820	30400	9590	27700	25800	3530 B	1520 B	72903	6450	
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
VANADIUM	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	
ZINC	160	56.4	2720	188	150	82.9	31.1	86.3 U	52.7	152	127	109	
CYANIDE	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	
PHENOL	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RIVFS INVESTIGATION

Sample Location	RES-GW-21	RES-GW-22	RES-GW-23	RES-GW-24	RES-GW-25	RES-GW-27	RES-GW-28	RES-GW-30	RES-GW-36	RES-GW-37	RES-GW-39	RES-GW-40	TRIP BLANK(a)
Date Sampled	2/24/88	2/23/88	2/22/88	2/23/88	2/24/88	2/22/88	2/26/88	2/26/88	2/22/88	2/22/88	2/26/88	2/24/88	2/23/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	---
Associated Blank Number	FB6	TB4	FB5	TB5	FB6	FB5	TB5	TB5	FB5	FB5	TB5	FB6	---
TENTATIVELY IDENTIFIED COMPOUNDS													
Volatiles (ppb)													
1,2-DICHLORO-1,1,2,3-TETRAFLUOROETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U
2-METHYLPROPANE	U	U	U	U	U	U	U	U	U	U	U	U	U
TRICHLOROFLUOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U
DICHLOROFLUOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U
PENTANE	U	U	U	U	U	U	U	U	U	U	U	U	U
DIBROMOMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U
Base neutral/Acid Extractables (ppb)													
5-METHYL-2-HEXANONE	U	1157	U	620	941	9	U	U	57	U	U	U	NOT
2-HEPTANONE	U	U	U	U	U	U	U	U	U	U	U	U	ANALYZED
BIS(2-ETHYLHEXYL)ESTER,HEXANEDIOIC ACID	U	U	U	U	U	45	U	U	123	100	U	U	
BIOCTYLESTER,HEXANEDIOICACID	U	U	U	U	U	U	U	U	U	U	U	U	
1,3,5-CYCLOHEPTATRIENE	U	1055	U	U	U	U	U	U	U	U	U	U	
1,3 BIOXAPIN-4,7-DIHYDRO	U	85	U	U	U	U	U	U	U	U	U	U	
1-PROPENE	U	172	U	U	U	U	U	U	U	U	U	U	
TRICHLOROETHENE	U	U	U	U	U	U	U	U	U	U	U	U	
CYCLOHEXENE	808	U	U	U	U	U	U	U	U	U	U	U	
4-PENTEN-2-OL	U	U	U	U	U	U	U	U	U	U	U	U	
2-PENTEN-2-OL	U	U	U	U	U	U	U	U	U	U	U	155	
2-PROPENYLESTER ACETIC ACID	U	U	U	U	U	U	53	U	U	U	U	U	

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RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI\FS INVESTIGATION

Sample Location	TRIP BLK(5)	FIELD BLK(6)
Date Sampled	2/26/88	2/24/88
Sample Matrix	---	---
Associated Blank Number	---	---
VOLATILE ORGANICS (ppb)		
CHLOROMETHANE	10 U	10 U
CHLOROETHANE	10 U	10 U
METHYLENE CHLORIDE	2 JB	5 U
ACETONE	9 JB	10 U
CARBON DISULFIDE	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U
CHLOROFORM	5 U	5 U
2-BUTANONE	10 U	10 U
BROMODICHLOROMETHANE	5 U	5 U
TRICHLOROETHENE	5 U	5 U
BENZENE	5 U	5 U
TETRACHLOROETHENE	5 U	5 U
TOLUENE	5 U	2 J
ETHYLBENZENE	5 U	5 U
TOTAL XYLENES	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)		
DIETHYLPHTHALATE	NOT ANALYZED	NOT ANALYZED
DI-N-BUTYLPHTHALATE		
BIS(2-ETHYHEXYL)PHTHALATE		
PESTICIDES/PCB'S (ppb)		
NONE DETECTED		
METALS (ppb)		
ALUMINUM	NOT ANALYZED	NOT ANALYZED
ANTIMONY		
ARSENIC		
BARIUM		
BERYLLIUM		
CADMIUM		
CALCIUM		
CHROMIUM		
COBALT		
COPPER		
IRON		
LEAD		
MAGNESIUM		
MANGANESE		
MERCURY		
NICKEL		
POTASSIUM		
SELENIUM		
SILVER		
SODIUM		
THALLIUM		
VANADIUM		
ZINC		
CYANIDE		
PHENOL		

RESIDENTIAL WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	TRIP BLK(5)	FIELD BLK(6)
Date Sampled	2/26/88	2/24/88
Sample Matrix	---	---
Associated Blank Number	---	---
TENTATIVELY IDENTIFIED COMPOUNDS		
Volatiles (ppb)		
1,2-DICHLORO-1,1,2,3-TETRAFLUOROETHANE	U	U
2-METHYLPROPANE	U	U
TRICHLOROFLUOROMETHANE	U	U
DICHLOROFLUOROETHANE	U	U
PENTANE	U	U
DIBROMOMETHANE	U	U
Base neutral/Acid Extractables (ppb)		
5-METHYL-2-HEXANONE	NOT ANALYZED	NOT ANALYZED
2-HEPTANONE		
BIS(2-ETHYLHEXYL)ESTERHEXANEDIOC ACID		
DIOCTYLESTERHEXANEDIOICACID		
1,3,5-CYCLOHEPTATRIENE		
1,3 DIOXAPIN-4,7-DIHYDRO		
1-PROPENE		
TRICHLOROETHENE		
CYCLOHEXENE		
4-PENTEN-2-OL		
2-PENTEN-2-OL		
2-PROPENYLESTER ACETIC ACID		

MONITORING WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	MW-2-GW	MW-2-DUP	MW-3-GW	MW-4-GW	MW-5-GW	MW-6-GW	DER #1	SMW-4	SMW-6	RINSATE(5)	FIELD BLK(7)	TRIP BLK(7)	TRIP BLK(8)	TRIP BLK(9)
Date Sampled	4/11/88	4/11/88	4/22/88	4/13/88	4/14/88	4/12/88	4/13/88	4/13/88	4/13/88	4/13/88	4/22/88	4/11/88	4/13/88	4/14/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	—	—	—	—	—
Associated Blank Number	TB7	TB7	FB7	RIN5, TB8	TB9	RIN5, TB8	RIN5, TB8	RIN5, TB8	RIN5, TB8	—	—	—	—	—
VOLATILE ORGANICS (ppb)														
CHLOROETHANE	10 U	10 U	10 U	10 U	11	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	2 JB	1 JB	6	5 U	1 J	3 JB	5 U	3 U	5 U	5 U	7	5 B	3 J	4 J
ACETONE	10 U	10 U	12	20 B	4 JB	10 U	25	15 B	45 B	10 U	25	10 U	10 U	14 B
1,1-DICHLOROETHANE	5 U	5 U	5 U	5	3 J	5 U	5 U	4 J	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	1 J	5 U	3 J	3 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-TRICHLOROETHANE	3 J	5 U	5 U	5 U	5 U	3 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	3 J	4 J	5 U	6	2 J	3 J	3 J	2 J	2 J	5 U	5 U	5 U	5 U	5 U
BENZENE	5 U	5 U	4 J	1 J	2 J	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U
TETRACHLOROETHENE	5 U	2 J	5 U	2 J	5 U	2 J	5 U	1 J	3 J	1 J	5 U	5 U	1 J	5 U
TOLUENE	1 J	5 U	4 J	1 J	1 J	1 J	5 U	5 U	5 U	5 U	2 J	5 U	1 J	5 U
ETHYLBENZENE	5 U	5 U	5 U	5	5 U	5 U	5 U	5	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE	5 U	5 U	14	14	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)														
DIETHYLPHTHALATE	20 U	20 U	20 U	2 J	6 J	20 U	20 U	20 U	20 U	20 U	20 U	NOT	NOT	NOT
BIS(2-ETHYHEXYL)PHTHALATE	36	60	46	68	54	46	72	36	62	34	20 U	ANALYZED	ANALYZED	ANALYZED
PESTICIDES/PCB'S (ppb)														
NONE DETECTED														
METALS (ppb)														
ALUMINUM	9820	1220	40.5 J	188 J	200 U	819	2400	1530	3380	200 U	200 U	NOT	NOT	NOT
ANTIMONY	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	ANALYZED	ANALYZED	ANALYZED
ARSENIC	10.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U			
BARIUM	162 J	56.1 J	1350	437	182 J	41.6 J	171 J	314	242	200 U	200 U			
BERYLLIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U			
CADMIUM	5 U	5 U	6.1 J	8.9 J	11.8 J	5 U	2.4 J	10.1 J	2.3 J	5 U	5 U			
CALCIUM	5800	11500	50900	12900	11100	10600	27700	13700	8540	5000 U	1080 J			
CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	28.7	10 U	10 U	10 U			
COBALT	6.5 J	50 U	110 J	79.3	50 U	50 U	11.9 J	29.4 J	11.8 J	50 U	50 U			
COPPER	25 U	27	25 U	25 U	25 U	18.9 J	15.3 J	25 U	25 U	25 U	25 U			
IRON	3400	1860	45500	102000	130000	1390	1390	121000	6770	97.6 J	55.9 J			
LEAD	10.2	12	5 U	15.9 J	5 U	7.2	5.4 J	17.4 J	5 UJ	5 UJ	5 U			
MAGNESIUM	3950 J	3990 J	23200	11500	6480	3710 J	3210 J	11300	7350	5000 U	394 J			
MANGANESE	259 J	71.3 J	2160	10100 J	889	53.1 J	693 J	8930 J	449 J	8.4 J	3.3 J			
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.8	0.2 U	0.2 U			
NICKEL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U			
POTASSIUM	1780 J	4790 J	86400	31100	5000 U	4290 J	2980 J	9020	7810	5000 U	5000 U			
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U			
SILVER	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U			
SODIUM	7340	8470	86800	42700	28200	7390	3530 J	27900	6330	72.4 J	268 J			
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U			
VANADIUM	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U			
ZINC	87.5 J	63.5 J	54.5 J	42.2	15.1 J	43.2 J	183	62.1	80.4	20 U	20 U			
CYANIDE	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U			
PHENOL	5 U	5 U	5 U	5 U	5 UJ	5 U	[illegible]	5 U	5 U	5 U	5 U			

AR301845

MONITORING WELL SAMPLES - SAMPLING ROUND 2
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	MW-2-6M	MW-2-6MD	MW-3-6M	MW-4-6M	MW-5-6M	MW-6-6M	DER #1	SPW-4	SPW-6	RINSATE(5)	FIELD BLK(7)	TRIP BLK(7)	TRIP BLK(6)	TRIP BLK(5)
Date Sampled	4/11/88	4/11/88	4/22/88	4/13/88	4/14/88	4/12/88	4/13/88	4/13/88	4/13/88	4/13/88	4/22/88	4/11/88	4/13/88	4/14/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	GROUNDWATER	---	---	---	---	---
Associated Blank Number	TB7	TB7	FB7	RINS, TB8	TB9	RINS, TB8	RINS, TB8	RINS, TB8	RINS, TB8	---	---	---	---	---
TENTATIVELY IDENTIFIED COMPOUNDS														
Volatiles (ppb)														
2-METHYLPROPANE	U	U	U	U	U	U	U	U	U	U	U	U	26	U
DICHLOROFLUOROMETHANE	U	U	U	U	U	9	U	U	U	U	U	U	U	U
DICHLORODIFLUOROMETHANE	U	U	U	U	21	U	U	12	7	U	U	U	U	U
3,3,5-TRIMETHYLCYCLOHEXANONE	U	U	33	U	U	U	U	U	U	U	U	U	U	U
PENTANE	U	U	U	U	U	U	U	19	U	U	U	U	U	U
Base neutral/Acid Extractables (ppb)														
5-METHYL-2-HEXANONE	U	26	U	U	U	U	U	35	U	9	U	NOT	NOT	NOT
NONO-2-ETHYLHEXYLESTER-HEXANEDIOIC ACID	U	50	32	U	20	U	16	U	U	14	U	ANALYZED	ANALYZED	ANALYZED
BROMOCYCLOHEXANE	U	U	U	U	13	U	U	U	U	U	U			
DIHYDRO-3-METHYLENE-2,5-FURANDIONE	U	U	U	U	U	U	U	14	U	U	U			
3,3,5-TRIMETHYL-CYCLOHEXANONE	U	U	U	U	U	U	U	73	U	U	U			
NONO2-(ETHOXYL)ESTER HEXANEDIOC ACID	U	U	U	U	U	U	U	14	23	U	U			

AR301846

MISCELLANEOUS SAMPLES
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	PT-1	PT-2	PT-3	MPDW	JEFDW	TRIP BLK(3)	TRIP BLK(6)
Date Sampled	3/29/88	3/30/88	3/31/88	1/14/88	2/15/88	2/15/88	3/29/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	DRILL-WATER	DRILL-WATER	—	—
Associated Blank Number	TB6	TB6	TB6	NONE	TB3		
VOLATILE ORGANICS (ppb)							
METHYLENE CHLORIDE	14	9	5	5 U	5 U	1 JB	13
ACETONE	10 U	10 U	35 B	10 U	10 U	19 B	40 B
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)							
DI-N-BUTYPHTHALATE	20 U	2 J	20 U	48	20 U	NOT	NOT
BIS(2-ETHYHEXYL)PHTHALATE	8 J	8 J	10 J	140	32	ANALYZED	ANALYZED
PESTICIDES/PCB'S (ppb)							
NONE DETECTED							
METALS (ppb)							
ALUMINUM	200 U	200 U	200 U	40 J	200 U	NOT	NOT
ANTIMONY	60 U	60 U	60 U	60 U	60 U	ANALYZED	ANALYZED
ARSENIC	10 U	10 U	10 U	10 U	10 U		
BARIUM	582 J	508 J	483 J	334	32.6 J		
BERYLLIUM	5 U	5 U	5 U	5 U	5 U		
CADMIUM	5 U	5 U	5 U	4 J	5 U		
CALCIUM	6020	5750	5960	63000	38800		
CHROMIUM	10 U	10 U	10 U	10 U	10 U		
COBALT	97.6	84.4	83.9	50 U	50 U		
COPPER	25 U	25 U	25 U	10.1 J	25 U		
IRON	44200	44900	45600	2436	992		
LEAD	5 U	5 U	5 U	5 U	12.8		
MAGNESIUM	6150	6140	6330	9148	10300		
MANGANESE	6100	5350	5300	38.3	16.3		
MERCURY	0.7	0.7	0.5	0.2 U	0.2 U		
NICKEL	40 U	40 U	40 U	40 U	40 U		
POTASSIUM	5000 U	5000 U	5000 U	1083	2270		
SELENIUM	5 U	5 U	5 U	5 U	5 U		
SILVER	10 U	10 U	10 U	10 U	10 U		
SODIUM	18000	18100	18400	11660	8850		
THALLIUM	10 U	10 U	10 U	10 U	10 U		
VANADIUM	50 U	50 U	50 U	50 U	50 U		
ZINC	23.9	33.2	22	304	35.2 B		
CYANIDE	10 UJ	10 UJ	10 UJ	10 U	10 UJ		
PHENOL	5 UJ	5 UJ	5 UJ	5 U	5 UJ		

SPLIT SPOON SAMPLES
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	SMW-4-SS	SMW-6-SS	SMW-6-OVA
Date Sampled	1/12/88	12/22/87	12/21/87
Sample Matrix	SOIL	SOIL	SOIL
VOLATILE ORGANICS (ppb)			
CHLOROETHANE	11 U	12 U	13 U
METHYLENE CHLORIDE	1 J	9	8
ACETONE	11 U	25	13 U
TRICHLROETHENE	6 U	6 U	6 U
BENZENE	6 U	6 U	6 U
TETRACHLOROETHENE	6 U	6 U	6 U
ETHYLBENZENE	6 U	6 U	6 U
TOTAL XYLENES	6 U	6 U	6 U
BASE NEUTRAL/ACID EXTRACTABLES (ppb)			
DI-N-BUTYPHTHALATE	260 J	160 J	130 J
BIS(2-ETHYHEXYL)PHTHALATE	1300	330 J	420 J
PESTICIDES/PCB'S (ppb)			
NONE DETECTED			
METALS (ppm)			
ALUMINUM	2984	44900	24153
ANTIMONY	60 U	60 U	60 U
ARSENIC	10 U	10 U	10 U
BARIUM	54.6 J	238	110 J
BERYLLIN	0.8 J	2.5 J	1.2 J
CADMIUM	3.3	11.6 B	10.9 B
CALCIUM	166 JB	4398	4485
CHROMIUM	9.7 J	11.9	45.7
COBALT	4.1 J	9.1 J	7.7 J
COPPER	13.4	41.6	21.6
IRON	1779	48420	48069
LEAD	5 U	3.8 J	21.9
MAGNESIUM	109 J	2816	6053
MANGANESE	16.7 J	512	255
MERCURY	0.1 U	0.1 U	0.1 U
NICKEL	5.5 J	9.9 J	16 J
POTASSIUM	2945	7389	10115
SELENIUM	5 U	3.1 J	5 U
SILVER	10 U	10 U	10 U
SODIUM	128 JB	108 J	95.3 J
THALLIUM	10 U	10 U	10 U
VANADIUM	6 J	28.6	36.1
ZINC	8.1 JB	127	121
CYANIDE	10 U	10 U	10 U
PHENOL	5 U	5 U	5 U

SPLIT SPOON SAMPLES
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	SMW-4-SS	SMW-6-SS	SMW-6-OVA
Date Sampled	1/12/88	12/22/87	12/21/87
Sample Matrix	SOIL	SOIL	SOIL
TENTATIVELY IDENTIFIED COMPOUNDS			
Volatiles (ppb)			
NONE IDENTIFIED			
Base Neutral/Acid Extractables (ppb)			
1,3,5-CYCLOHEPTATRIENE	2391	U	U
4-METHYL-OCTANE	5806	U	U
3-HEXENE-2,5-DIONE	U	469	U

MISCELLANEOUS SAMPLES
CHEMICAL ANALYTICAL RESULTS
WELSH ROAD LANDFILL RI/FS INVESTIGATION

Sample Location	PT-1	PT-2	PT-3	MPDW	JEFDW	TRIP BLK(3)	TRIP BLK(6)
Date Sampled	3/29/88	3/30/88	3/31/88	1/14/88	2/15/88	2/15/88	3/29/88
Sample Matrix	GROUNDWATER	GROUNDWATER	GROUNDWATER	DRILL-WATER	DRILL-WATER	—	—
Associated Blank Number	TB6	TB6	TB6	NONE	TB3		
TENTATIVELY IDENTIFIED COMPOUNDS							
Volatiles (ppb)							
DICHLOROFLUOROMETHANE	17	17	24	U	U	U	U
PENTANE	7	10	U	U	U	U	U
Base Neutral/Acid Extractables (ppb)							
N,N-DIMETHYLFORMAMIDE	47	45	U	U	U	NOT	NOT
5-METHYL-2-HEXANONE	U	U	U	U	19	ANALYZED	ANALYZED
BIS(2-ETHYLHEXYL)ESTER HEXANEDIOIC ACID	U	U	U	U	133		

APPENDIX D
Summary of Sampling Data from the Focused Groundwater Study
for the Welsh Road Site

^INORGANIC CONTAMINANT DATA SUMMARY TABLE

	ANTIMONY					ANTIMONY transformed					ANTIMONY (FILTERED)					ANTIMONY (FILTERED) transformed					ARSENIC					ARSENIC transformed				
BARKMAN	21.2 B	UG/L																			3 K	UG/L								
SHANKS	10.5 ND	UG/L																			2.3 K	UG/L								
STAGGS	10.5 ND	UG/L																			4.6 K	UG/L								
HOFFMAN	10.5 ND	UG/L																			3 K	UG/L								
SLOSENSKI	10.5 ND	UG/L																			1.1 ND	UG/L								
BANNON, HW 1	23.5 ND	UG/L									23.5 ND	UG/L									4.9 K	UG/L								
SHORES, HW 2	23.5 ND	UG/L									23.5 ND	UG/L									3.6 K	UG/L								
MANSER, HW 3	23.5 ND	UG/L									23.5 ND	UG/L									3.2 K	UG/L								
DEGEZELLE, HW 4	23.5 ND	UG/L									23.5 ND	UG/L									1.1 ND	UG/L								
FUNK, HW 5	23.5 ND	UG/L									23.5 ND	UG/L									2.3 B	UG/L								
SAMUELS, HW 7	54.6	UG/L									23.5 ND	UG/L									3.6 K	UG/L								
BEACHY, HW 8	23.5 ND	UG/L									23.5 ND	UG/L									1.0 UL	UG/L								
BROWN, HW 40	1.0 ND	UG/L																			1 ND	UG/L								
RAMSEY, HW 10																					1 ND	UG/L								
HAYES, HW 43																					1 ND	UG/L								
GRUBB, HW 49																					1 ND	UG/L								
L. STOLTZFUS, HW 30																					1 ND	UG/L								
D. STOLTZFUS, HW 41																					1 ND	UG/L								
MWEPA-1A																					1 ND	UG/L	17.660022			0	1.0			
MWEPA-6A																					1 ND	UG/L	17.660022			0	1.0			
MW-6	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UL	UG/L	17.660022			0	1.0			
MW-4	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UL	UG/L	17.660022			0	1.0			
PIEZ-1	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UL	UG/L	17.660022			0	1.0			
SHALLOW MW-4	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				2.2 L	UG/L	9.0265941			0.7	0.0			
SHALLOW MW-6	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UL	UG/L	17.660022			0	1.0			
MW-3	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				6.6 L	UG/L	1.9456693			1.8	0.7			
MW-5	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				8.2 L	UG/L	8.9714512			2.1	1.1			
MWDER-2	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				9.9 L	UG/L	22.045260			2.2	1.8			
MWBH-WELL	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UL	UG/L	17.660022			0	1.0			
MWEPA-3	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				3.7 J	UG/L	2.2643083			1.3	0.0			
MWEPA-4A	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UJ	UG/L	17.660022			0	1.0			
MWEPA-5	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				1 UJ	UG/L	17.660022			0	1.0			
MWEPA-5A	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				2.4 J	UG/L	7.6666693			0.8	0.0			
MWEPA-6	19.4	UG/L	256.3			2.96	3.76				2.5 ND	UG/L	0			0.9	0				1 UJ	UG/L	17.660022			0	1.0			
MW-2	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				16.4 J	UG/L	103.94267			2.7	2.9			
MW-2D	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				12.7 J	UG/L	56.178594			2.5	2.3			
MWEPA-1	2.5 UL	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				6.4	UG/L	1.4265941			1.8	0.7			
MWEPA-2	2.5 ND	UG/L	0.791			0.91	0.01				2.5 ND	UG/L	0			0.9	0				27.1 J	UG/L	479.40145			3.2	5.2			
MWEPA-2A	2.5 ND	UG/L	0.791	1.7		0.91	0.01	1.8			2.5 ND	UG/L	0	1.7		0.9	0	0			4.7 J	UG/L	0.2547645	1.72		1.5	0.2	2.5		
	64.4		270.5	3.3	4.091	19.4	3.97	1.0	3.840		47.5		0	2.5	2.5	17.	0	0.9	2.5		100.3		870.12052	5.20	7.667645	21.	25.	1.0	9.648	
	19		18	3.8		19	18	0.4			19		18	0		19	18	0			21		20	6.59		21	20	1.1		
===BACKGROUND WELLS===																														
W-5	5 ND	UG/L																			2.9	UG/L								
W-2	5 ND	UG/L																			1 ND	UG/L								
W-7	5 ND	UG/L																			1 ND	UG/L								
FIELD BLK	5 ND	UG/L																			1 ND	UG/L								
SW 1-JL STOLTZFUS	2.5 R	UG/L																			1 ND	UG/L								
SW 2-D STOLTZFUS	2.5 R	UG/L																			1 ND	UG/L								

^INORGANIC CO[illegible]NANT DATA SUMMARY TABLE

	LEAD								LEAD *transformed*								LEAD (FILTERED)								LEAD (FILTERED) *transformed*							
BARKMAN	2.3 B	UG/L																														
SHANKS	6.9	UG/L																														
STAGGS	0.55 ND	UG/L																														
HOFFMAN	0.55 ND	UG/L																														
BLOSENSKI	3.5 B	UG/L																														
HW 1--BANNON	12.2 B	UG/L															8.6 B	UG/L														
HW 2--SHORES	3.3 B	UG/L															1 UL	UG/L														
HW 3--MANSER	3.3 B	UG/L															3.3 B	UG/L														
HW 4--DEGEZIELLE	1 ND	UG/L															1 ND	UG/L														
HW 5--FUNK	2.6 B	UG/L															1 ND	UG/L														
HW 7--SAMUELS	6.3 B	UG/L															1 ND	UG/L														
HW 8--BEACHY	1 ND	UG/L															1 ND	UG/L														
HW 40--BROWN	6.7	UG/L																														
HW 16--RAMSEY	2.6 B	UG/L															8	UG/L														
HW 43--HAYES	1 ND	UG/L															1 ND	UG/L														
HW 46--GRUBB	1 ND	UG/L															1 ND	UG/L														
HW48D	1 ND	UG/L															1 ND	UG/L														
HW30--STOLTZFUS	2.1 B	UG/L															2.3	UG/L														
HW41D STOLTZFUS	1 ND	UG/L															1 ND	UG/L														
MW EPA--1A	4.6	UG/L	166.6						1.52	0.34							1 ND	UG/L	0.0				0	0.0								
MW EPA--6A	23.4	UG/L	26.79						3.15	1.06							1 ND	UG/L	0.0				0	0.0								
MW--8	5.5 J	UG/L	161.8						1.70	0.16							1 ND	UG/L	0.0				0	0.0								
MW--4	5.6 J	UG/L	154.3						1.76	0.12							1 ND	UG/L	0.0				0	0.0								
PIEZ--1	3.6 J	UG/L	208.0						1.33	0.60							1 ND	UG/L	0.0				0	0.0								
SHALLOW MW--4	14.2 J	UG/L	16.19						2.65	0.29							1 ND	UG/L	0.0				0	0.0								
SHALLOW MW--6	26.7 J	UG/L	109.7						3.35	1.56							1 ND	UG/L	0.0				0	0.0								
MW--3	2.3 J	UG/L	253.5						0.83	1.63							1 ND	UG/L	0.0				0	0.0								
MW--5	16.4 J	UG/L	3.326						2.79	0.47							1 ND	UG/L	0.0				0	0.0								
MW DER--2	1 UJ	UG/L	296.6						0	4.45							6.3	UG/L	24.				1.6	2.9								
MW BH--WELL	4.6 J	UG/L	165.6						1.52	0.34							1 ND	UG/L	0.0				0	0.0								
MW EPA--3	3.6	UG/L	213.8						1.26	0.66							1 ND	UG/L	0.0				0	0.0								
MW EPA--4A	2.3	UG/L	253.5						0.83	1.63							1 ND	UG/L	0.0				0	0.0								
MW EPA--5	12.3	UG/L	35.09						2.50	0.15							1 ND	UG/L	0.0				0	0.0								
MW EPA--5A	8.3	UG/L	98.48						2.11	0.00							1 ND	UG/L	0.0				0	0.0								
MW EPA--6	2.1	UG/L	259.9						0.74	1.87							1 ND	UG/L	0.0				0	0.0								
MW--2	114	UG/L	9173.						4.73	6.89							1 ND	UG/L	0.0				0	0.0								
MW--2D	99.3	UG/L	6573.						4.59	6.19							1 ND	UG/L	0.0				0	0.0								
MW EPA--1	14	UG/L	17.84						2.63	0.28							2.3 B	UG/L	0.9				0.8	0.4								
MW EPA--2	7.4	UG/L	117.1						2.00	0.01							1 ND	UG/L	0.0				0	0.0								
MW EPA--2A	9.1	UG/L	83.24	1.7					2.20	0.00	2.9						1 ND	UG/L	0.0	1.7			0	0.0	1.9							
	582.		16427	18.	28.64				44.3	28.8	2.1	37.12					27.6		27.	1.5	1.767		2.6	3.7	0.1	1.466						
	21		20	30.					21	20	1.2						21		20	1.1			21	20	0.4							
===BACKGROUND WELLS===																																
W--6	1 ND	UG/L																														
W--2	6.7 L	UG/L																														
W--7	1 ND	UG/L																														
FIELD BLK	1 ND	UG/L																														
SW 1--JL STOLTZFUS PD	1 ND	UG/L																														
SW 2--D STOLTZFUS	1 ND	UG/L																														

	MANGANESE								MANGANESE *transformed*							
	309	UG/L														
	297	UG/L														
	1 ND	UG/L														
	1130	UG/L														
	133	UG/L														
	76.3 B	UG/L														
	12.7 B	UG/L														
	66.7 B	UG/L														
	4.3 B	UG/L														
	66.4 B	UG/L														
	194	UG/L														
	11 B	UG/L														
	88.8	UG/L														
	7.6 J	UG/L														
	0.5 UJ	UG/L														
	279 J	UG/L														
	275 J	UG/L														
	329 J	UG/L														
	5.6 J	UG/L														
MW EPA--1A	160 J	UG/L	8252022.2						5.1	2.6						
MW EPA--6A	3270 J	UG/L	47248.267						8.0	1.6						
MW--8	14.3	UG/L	9231469.4						2.6	17.						
MW--4	4590	UG/L	2363496.2						6.4	2.5						
PIEZ--1	2660	UG/L	154160.93						7.8	1.1						
SHALLOW MW--4	6950	UG/L	15189466.						6.8	4.0						
SHALLOW MW--6	1110	UG/L	3773634.2						7.0	0.0						
MW--3	1560	UG/L	2227954.2						7.3	0.2						
MW--5	1270	UG/L	3177781.6						7.1	0.1						
MW DER--2	696	UG/L	5553720.6						6.5	0.0						
MW BH--WELL	219	UG/L	8029477.8						5.3	2.0						
MW EPA--3	1560	UG/L	2166646.9						7.3	0.2						
MW EPA--4A	9710	UG/L	44320530.						9.1	5.5						
MW EPA--5	40.90	UG/L	9070537.6						3.7	9.6						
MW EPA--5A	24600	UG/L	464269010						10.	10.						
MW EPA--6	70.1	UG/L	8695505.0						4.2	6.6						
MW--2	1600	UG/L	1566080.2						7.4	0.4						
MW--2D	1610	UG/L	2081160.9						7.3	0.3						
MW EPA--1	690	UG/L	5582036.2						6.5	0.0						
MW EPA--2	1210	UG/L	3365297.6						7.0	0.0						
MW EPA--2A	276	UG/L	7715246.9	1.72					5.6	1.4	3.7					
	64106		807067717	3052	5126.644				143	67.	6.8	22750				
	21		20	5509					21	20	1.6					
W--6	14.1	UG/L														
W--2	14.6	UG/L														
W--7	3.5 ND	UG/L														
FIELD BLK	3.5 ND	UG/L														
SW 1--JL STOLTZFUS PD	4.7 J	UG/L														
SW 2--D STOLTZFUS	99.7 J	UG/L														

^ INORGANIC CONTAMINANT DATA SUMMARY TABLE

	ARSENIC (FILTERED)					ARSENIC (FILTERED) transformed				BARIUM					BARIUM transformed				BARIUM (FILTERED)					BARIUM (FILTERED) transformed			
BARKMAN										173	UG/L															
SHANKS										145	UG/L															
STAGGS										9.5 ND	UG/L															
HOFFMAN										103	UG/L															
BLOSENSKI										160	UG/L															
SANNON, HW 1	2.2 B	UG/L								99.6	UG/L								76.2 B	UG/L						
SHORES, HW 2	1.0 ND	UG/L								13 B	UG/L								15.7 B	UG/L						
MANSER, HW 3	1.0 ND	UG/L								73.5 B	UG/L								79.9 B	UG/L						
DEGEZELLE, HW 4	1.0 ND	UG/L								20.9	UG/L								16.2 B	UG/L						
FUNK, HW 5	1.0 ND	UG/L								106 B	UG/L								113 B	UG/L						
SAMUELS, HW 7	2.4 B	UG/L								165 B	UG/L								165 B	UG/L						
BEACHY, HW 8	1.0 UL	UG/L								21.6 B	UG/L								25.4 B	UG/L						
BROWN, HW 49										64.4	UG/L															
RAMSEY, HW 10	1 ND	UG/L								21.2	UG/L								22.1	UG/L						
HAYES, HW 43	1 ND	UG/L								5.0 ND	UG/L								5.0 ND	UG/L						
GRUBB, HW 48	1 ND	UG/L								150	UG/L								147	UG/L						
L STOLTZFUS, HW 30	1 ND	UG/L								150	UG/L								167	UG/L						
D. STOLTZFUS, HW 41	1 ND	UG/L								60	UG/L								78	UG/L						
MW EPA-1A	1 ND	UG/L	6.5877			0	0.3			142	UG/L	112915.			4.9	0.6			112	UG/L	40932.9			4.7	0.1	
MW EPA-6A	1 ND	UG/L	6.5877			0	0.3			364	UG/L	13002.5			5.8	0.0			114	UG/L	40127.7			4.7	0.1	
MW-6	1 ND	UG/L	6.5877			0	0.3			43.5	UG/L	188615.			3.7	3.8			41.5	UG/L	74430.2			3.7	2.0	
MW-4	1 ND	UG/L	6.5877			0	0.3			650	UG/L	29574.1			6.4	0.8			616	UG/L	91011.3			6.4	1.6	
PIEZ-1	1 ND	UG/L	6.5877			0	0.3			462	UG/L	256.918			6.1	0.1			466	UG/L	23617.8			6.1	1.0	
SHALLOW MW-4	2.5	UG/L	1.1377			0.9	0.1			473	UG/L	26.2666			6.1	0.1			367	UG/L	2775.26			5.9	0.5	
SHALLOW MW-6	1 ND	UG/L	6.5877			0	0.3			457	UG/L	442.200			6.1	0.1			145	UG/L	26668.9			4.9	0.0	
MW-3	6.8	UG/L	10.454			1.9	1.7			942	UG/L	215269.			6.8	1.2			891	UG/L	332560.			6.7	2.7	
MW-5	5.8	UG/L	4.9877			1.7	1.3			326	UG/L	22506.5			5.7	0.0			329	UG/L	215.530			5.7	0.4	
MW DER-2	15.0	UG/L	144.80			2.7	4.7			369	UG/L	7926.06			5.9	0.0			461	UG/L	21515.3			6.1	0.9	
MW BH-WELL	1 ND	UG/L	6.5877			0	0.3			67.4	UG/L	166615.			4.2	2.3			69.5	UG/L	59936.3			4.2	0.8	
MW EPA-3	1 ND	UG/L	6.5877			0	0.3			116	UG/L	131789.			4.7	0.9			104	UG/L	44234.1			4.6	0.2	
MW EPA-4A	1 ND	UG/L	6.5877			0	0.3			1490	UG/L	1024066			7.3	2.4			1460	UG/L	1312564			7.2	4.6	
MW EPA-5	1 ND	UG/L	6.5877			0	0.3			77.7	UG/L	160262.			4.3	1.9			53.5	UG/L	68026.5			3.9	1.3	
MW EPA-5A	1 ND	UG/L	6.5877			0	0.3			1070	UG/L	360430.			6.9	1.5			836	UG/L	274241.			6.7	2.5	
MW EPA-6	1 ND	UG/L	6.5877			0	0.3			124	UG/L	125336.			4.8	0.8			119	UG/L	36149.5			4.7	0.1	
MW-2	1 ND	UG/L	6.5877			0	0.3			1160	UG/L	465065.			7.0	1.7			27	UG/L	82552.2			3.2	3.4	
MW-2D	1 ND	UG/L	6.5877			0	0.3			962	UG/L	234228.			6.8	1.2			26.6	UG/L	81635.3			3.3	3.1	
MW EPA-1	1 ND	UG/L	6.5877			0	0.3			441	UG/L	1371.11			6.0	0.1			123	UG/L	36602.9			4.8	0.1	
MW EPA-2	24.1	UG/L	421.61			3.1	6.7			136	UG/L	116963.			4.9	0.6			96.6	UG/L	47401.5			4.5	0.3	
MW EPA-2A	5.1	UG/L	2.3511	1.72		1.6	1.1	2.5		145	UG/L	110906.	1.7		4.9	0.5	2.5		137	UG/L	31442.0	1.7		4.9	0.0	2.5
	74.9		884.16	5.56	5.788502	12.	20.	0.5	5.404	10038		5479632	476	856.044	120	21.	5.7	952.40	3600		2732660	314	459.4	107	26.	5.1	841.6
	21		20	5.64		21	20	1.0		21		20	417		21	20	1.0		21		20	369		21	20	1.1	
===BACKGROUND WELLS===																										
W-5										33.8	UG/L															
W-2										33.8	UG/L															
W-7										27.9	UG/L															
FIELD BLK										1 ND	UG/L															
SW 1-JL STOLTZFUS										22.6	UG/L															
SW 2-D STOLTZFUS										51.6	UG/L															

^INORGANIC C[redacted]ANT DATA SUMMARY TABLE

	MANGANESE (FILTERED)					MANGANESE (FILTERED) transformed					MERCURY					MERCURY transformed					MERCURY (FILTERED)					MERCURY (FILTERED) transformed				
BARKMAN											0.4	UG/L																	
SHANKS											2.6	UG/L																	
STAGGS											0.1 ND	UG/L																	
HOFFMAN											0.2	UG/L																	
BLOSENSKI											0.1 ND	UG/L																	
HW 1–BANNON	36.6 B	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW 2–SHORES	12.1 B	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW 3–MANSER	70.4 B	UG/L									6.8	UG/L								6.3	UG/L								
HW 4–DEGEZELLE	1 ND	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW 5–FUNK	67.6 B	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW 7–SAMUELS	175	UG/L									0.43	UG/L								0.78	UG/L								
HW 8–BEACHY	9.3 B	UG/L									0.31	UG/L								0.1 ND	UG/L								
HW 40–BROWN											0.1 ND	UG/L																	
HW 10–RAMSEY	8.3	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW 43–HAYES	1.9 B	UG/L									2.3	UG/L								1.2	UG/L								
HW 46–GRUBB	275	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW46D	272	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
HW30–STOLTZFUS	340	UG/L									1.4	UG/L								1.4	UG/L								
HW41D STOLTZFUS	5.1	UG/L									0.1 ND	UG/L								0.1 ND	UG/L								
MWEPA–1A	159	UG/L	7E+06			5.0	1.6				0.42	UG/L	0.49467			−0.	0.2			0.1 ND	UG/L	0.21423			−2.	0.2			
MWEPA–6A	2750	UG/L	869.68			7.9	2.5				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 ND	UG/L	0.21423			−2.	0.2			
MW–6	11.5	UG/L	7E+06			2.4	15.				0.1 UL	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MW–4	4410	UG/L	3E+06			8.3	4.2				1.0	UG/L	0.01521			0	1.7			0.52	UG/L	0.00183			−0.	1.3			
PIEZ–1	2640	UG/L	6481.7			7.8	2.3				1.5	UG/L	0.14187			0.4	2.9			0.1 UL	UG/L	0.21423			−2.	0.2			
SHALLOW MW–4	6970	UG/L	2E+07			8.8	6.3				0.1 UL	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
SHALLOW MW–6	165	UG/L	7E+06			5.1	1.8				12.2	UG/L	122.692			2.5	14.			7.5	UG/L	46.1239			2.0	14.			
MW–3	1480	UG/L	2E+06			7.2	0.9				0.2 L	UG/L	0.65254			−1.	0.0			0.3 L	UG/L	0.06909			−1.	0.3			
MW–5	1300	UG/L	2E+06			7.1	0.6				0.1 UL	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MWDER–2	759	UG/L	4E+06			6.6	0.0				0.1 UL	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MWSH–WELL	260	UG/L	6E+06			5.5	0.5				4.6	UG/L	12.0672			1.5	8.0			0.2 L	UG/L	0.13166			−1.	0.0			
MWEPA–3	1570	UG/L	1E+06			7.3	1.0				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 ND	UG/L	0.21423			−2.	0.2			
MWEPA–4A	9680	UG/L	5E+07			9.1	8.0				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MWEPA–5	4.6 B	UG/L	7E+06			1.5	23.				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 ND	UG/L	0.21423			−2.	0.2			
MWEPA–5A	22600	UG/L	4E+06			10.	13.				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 ND	UG/L	0.21423			−2.	0.2			
MWEPA–6	63.6	UG/L	7E+06			4.1	4.7				1.5	UG/L	0.14187			0.4	2.9			1.7 L	UG/L	1.29309			0.5	5.4			
MW–2	102	UG/L	7E+06			4.6	2.9				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MW–2D	112	UG/L	7E+06			4.7	2.6				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MWEPA–1	618	UG/L	4E+06			6.4	0.0				0.87 L	UG/L	0.06417			−0.	1.3			0.1 ND	UG/L	0.21423			−2.	0.2			
MWEPA–2	1210	UG/L	2E+06			7.0	0.5				0.1 ND	UG/L	1.04721			−2.	0.9			0.1 UL	UG/L	0.21423			−2.	0.2			
MWEPA–2A	266	UG/L	6E+06	1.72		5.5	0.5	4.1			0.1 UL	UG/L	1.04721	1.7		−2.	0.9	3.3		0.1 UL	UG/L	0.21423	1.7		−2.	0.2	2.8		
	57130		5E+06	2720	4877.588	133	93.	6.5	49976		23.59		150.103	1.1	2.18457	−27	44.	−1.	2.4662	11.6		53.0474	0.5	1.175	−37	25.	−1.	0.606	
	21		20	5196		21	20	2.1			21		20	2.7		21	20	1.4		21		20	1.6		21	20	1.1		
===BACKGROUND WELLS===																													
W–5											0.1 ND	UG/L																	
W–2											0.1 ND	UG/L																	
W–7											0.1 ND	UG/L																	
FIELD BLK											0.1 ND	UG/L																	
SW 1–JL STOLTZFUS PD											0.1 ND	UG/L																	
SW 2–D STOLTZFUS											0.1 ND	UG/L																	

^INORGANIC CONTAMINANT DATA SUMMARY TABLE

	BERYLLIUM					BERYLLIUM *transformed*				BERYLLIUM (FILTERED)				BERYLLIUM (FILTERED) *transformed*				CHROMIUM				CHROMIUM *transformed*			
BARKMAN	1.3	UG/L																8.0 ND	UG/L						
SHANKS	1.2	UG/L																3.0 ND	UG/L						
STAGGS	0.5 ND	UG/L																3.0 ND	UG/L						
HOFFMAN	0.5 ND	UG/L																3.0 ND	UG/L						
BLOSENSKI	0.5 ND	UG/L																3.0 ND	UG/L						
BANNON, HW 1	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
SHORES, HW 2	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
MANSER, HW 3	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
DEGEZELLE, HW 4	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
FUNK, HW 5	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
SAMUELS, HW 7	0.5 ND	UG/L								0.5 ND	UG/L							3.0 ND	UG/L						
BEACHY, HW 8	0.5 ND	UG/L								0.5 ND	UG/L							9.3	UG/L						
BROWN, HW 40	0.5 ND	UG/L																3.0 ND	UG/L						
RAMBEY, HW 10	0.5 ND	UG/L																4.0 ND	UG/L						
HAYES, HW 43	0.5 ND	UG/L								0.5 ND	UG/L							2.5 ND	UG/L						
GRUBB, HW 48	0.5 ND	UG/L								0.5 ND	UG/L							2.5 ND	UG/L						
L. STOLTZFUS, HW 30	0.5 ND	UG/L								0.5 ND	UG/L							2.5 ND	UG/L						
D. STOLTZFUS, HW 41	0.5 ND	UG/L								0.5 ND	UG/L							2.5 ND	UG/L						
MW EPA-1A	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			7.8	UG/L	13.9		2.0	0.21		
MW EPA-6A	1.1	UG/L	0.0262			0.095	0.2			0.5 ND	UG/L	0		-0.69	0			22.60	UG/L	122.		3.1	2.34		
MW-6	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
MW-4	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
PIEZ-1	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
SHALLOW MW-4	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			18.3	UG/L	45.7		2.9	1.73		
SHALLOW MW-6	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			5.20	UG/L	40.1		1.6	0.00		
MW-3	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			4.60	UG/L	46.1		1.5	0.00		
MW-5	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
MW DER-2	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
MW BH-WELL	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.0 ND	UG/L	90.9		0.6	0.80		
MW EPA-3	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND.	UG/L	81.6		0.9	0.45		
MW EPA-4A	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND	UG/L	81.6		0.9	0.45		
MW EPA-5	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND	UG/L	81.6		0.9	0.45		
MW EPA-5A	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND	UG/L	81.6		0.9	0.45		
MW EPA-6	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND	UG/L	81.6		0.9	0.45		
MW-2	8.9	UG/L	58.340			2.166	6.6			0.5 ND	UG/L	0		-0.69	0			35.9	UG/L	593.		3.5	3.97		
MW-2D	7.5	UG/L	38.913			2.014	5.7			0.5 ND	UG/L	0		-0.69	0			33.1	UG/L	464.		3.4	3.65		
MW EPA-1	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			85.3	UG/L	5440		4.4	8.16		
MW EPA-2	0.5 ND	UG/L	0.5804			-0.69	0.0			0.5 ND	UG/L	0		-0.69	0			2.5 ND	UG/L	81.6		0.9	0.45		
MW EPA-2A	0.5 ND	UG/L	0.5804	1.7		-0.69	0.0	2.90		0.5 ND	UG/L	0	1.7	-0.69	0	0		2.5 ND	UG/L	81.6	1.7	0.9	0.45	2.5	
	26.5		107.72	1.2	2.156	-5.18	14.	-0.3	1.466	10.		0	0.5	-14.5	0	-0.69	0.5	242.		7867	11.	19.01	33.	28.0	1.5	16.47
	21		20	2.3		21	20	0.84		21		20	0	21	20	0		21		20	19.		21	20	1.1	
BACKGROUND WELLS																									
W-5	0.5 ND	UG/L																2.5 ND	UG/L						
W-2	0.5 ND	UG/L																2.5 ND	UG/L						
W-7	0.5 ND	UG/L																2.5 ND	UG/L						
FIELD BLK	0.5 ND	UG/L																2.5 ND	UG/L						
SW 1-JL STOLTZFUS	0.5 ND	UG/L																2.5 ND	UG/L						
SW 2-D STOLTZFUS	0.5 ND	UG/L																2.5 ND	UG/L						

^INORGANIC C[illegible]NANT DATA SUMMARY TABLE

	NICKEL					NICKEL *transformed*				NICKEL (FILTERED)				NICKEL (FILTERED) *transformed*				THALLIUM				THALLIUM *transformed*			
BARKMAN	13.5 ND	UG/L																1.1 ND	UG/L						
SHANKS	13.5 ND	UG/L																1.1 ND	UG/L						
STAGGS	13.5 ND	UG/L																1.1 UL	UG/L						
HOFFMAN	13.5 ND	UG/L																1.1 ND	UG/L						
BLOSENSKI	13.5 ND	UG/L																1.1 ND	UG/L						
HW 1-BANNON	13.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 2-SHORES	13.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 3-MANSER	13.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 4-DEGEZELLE	13.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 5-FUNK	4.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 7-SAMUELS	13.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 8-BEACHY	4.5 ND	UG/L								4.5 ND	UG/L							2 UL	UG/L						
HW 40-BROWN	10 ND	UG/L																2 UL	UG/L						
HW 10-RAMSEY	3.5 ND	UG/L								3.5 ND	UG/L							1 ND	UG/L						
HW 43-HAYES	3.5 ND	UG/L								3.5 ND	UG/L							1.5 ND	UG/L						
HW 48-GRUBB	3.5 ND	UG/L								3.5 ND	UG/L							1.5 ND	UG/L						
HW40D	3.5 ND	UG/L								3.5 ND	UG/L							1.5 ND	UG/L						
HW30-STOLTZFUS	3.5 ND	UG/L								3.5 ND	UG/L							1.5 ND	UG/L						
HW41D STOLTZFUS	3.5 ND	UG/L								3.5 ND	UG/L							1.5 ND	UG/L						
MW EPA-1A	12.6	UG/L	36.714			2.533	0.2			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 ND	UG/L	6.23		0.4	0.27		
MW EPA-6A	22.7	UG/L	17.006			3.122	1.1			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW-6	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW-4	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
PIEZ-1	8.8	UG/L	95.573			2.174	0.0			3.5 ND	UG/L	2.0956		1.252	0.0			4.9 L	UG/L	0.26		1.5	0.44		
SHALLOW MW-4	16.2	UG/L	0.1415			2.901	0.7			10.	UG/L	26.647		2.332	0.7			1.5 UL	UG/L	6.23		0.4	0.27		
SHALLOW MW-6	10.5	UG/L	65.224			2.351	0.0			3.5 ND	UG/L	2.0956		1.252	0.0			15 UL	UG/L	112.		2.7	3.17		
MW-3	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			15 UL	UG/L	112.		2.7	3.17		
MW-5	3.5 ND	UG/L	227.29			1.252	0.6			4 ND	UG/L	2.0956		1.252	0.0			15 UL	UG/L	112.		2.7	3.17		
MW DER-2	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW BH--WELL	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-3	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-4A	8.2 B	UG/L	107.66			2.104	0.0			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-5	3.5 ND	UG/L	227.29			1.252	0.6			7.0 B	UG/L	4.2122		1.945	0.2			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-5A	3.5 ND	UG/L	227.29			1.252	0.6			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-6	7.3 B	UG/L	127.15			1.967	0.0			13. B	UG/L	66.101		2.580	1.1			1.5 UL	UG/L	6.23		0.4	0.27		
MW-2	136	UG/L	13786.			4.912	8.1			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW-2D	112	UG/L	8726.0			4.718	7.0			3.5 ND	UG/L	2.0956		1.252	0.0			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-1	15.3	UG/L	10.733			2.727	0.4			3.5 ND	UG/L	2.0956		1.252	0.0			15 UL	UG/L	112.		2.7	3.17		
MW EPA-2	3.5 ND	UG/L	227.29			1.252	0.6			7.7 B	UG/L	7.5756		2.041	0.3			1.5 UL	UG/L	6.23		0.4	0.27		
MW EPA-2A	3.5 ND	UG/L	227.29	1.7		1.252	0.6	2.56		9.7 B	UG/L	22.585	1.7	2.272	0.8	1.906					1.7				2.4
	300.		25475.	18.	52.01	43.31	24.	2.06	27.68	103		164.65	4.9	31.21	3.9	1.456	5.889	67.4		575.	4.3	0.496	18.	17.2	0.9	6.745
	21		20	36.		21	20	1.11		21		20	2.8	21	20	0.442		20		19	6.5		20	19	0.9	
---BACKGROUND WELLS---																									
W-5	2.5 ND	UG/L																1 UL	UG/L						
W-2	2.5 ND	UG/L																1 UL	UG/L						
W-7	2.5 ND	UG/L																1 UL	UG/L						
FIELD BLK	2.5 ND	UG/L																1 ND	UG/L						
SW 1-JL STOLTZFUS PD	3.5 ND	UG/L																							
SW 2-D STOLTZFUS	3.5 ND	UG/L																1.5 ND	UG/L						
																		1.5 ND	UG/L						

^INORGANIC CONTAMINANT DATA SUMMARY TABLE

	CHROMIUM (FILTERED)					CHROMIUM (FILTERED) transformed					COBALT					COBALT transformed					COBALT (FILTERED)					COBALT (FILTERED) transformed				
BARKMAN											4 ND	UG/L																	
SHANKS											4 ND	UG/L																	
STAGGS											4 ND	UG/L																	
HOFFMAN											4 ND	UG/L																	
BLOSENSKI											4 ND	UG/L																	
BANNON, HW 1	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
SHORES, HW 2	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
MANSER, HW 3	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
DEGEZELLE, HW 4	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
FUNK, HW 5	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
SAMUELS, HW 7	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
BEACHY, HW 8	3 ND	UG/L									4 ND	UG/L									4 ND	UG/L							
BROWN, HW 40											5 ND	UG/L																	
RAMSEY, HW 10	2.5 ND	UG/L									2.5 ND	UG/L									2.5 ND	UG/L							
HAYES, HW 43	2.5 ND	UG/L									2.5 ND	UG/L									2.5 ND	UG/L							
GRUBB, HW 46	2.5 ND	UG/L									2.5 ND	UG/L									2.5 ND	UG/L							
L STOLTZFUS, HW 30	2.5 ND	UG/L									6.8	UG/L									11.	UG/L							
D. STOLTZFUS, HW 41	2.5 ND	UG/L									2.5 ND	UG/L									2.5 ND	UG/L							
MW EPA-1A	2.5 ND	UG/L	0.03			0.9	0.0				2.5 ND	UG/L	1056.2			0.9	2.9				2.5 ND	UG/L	639.60			0.9	1.6		
MW EPA-6A	2.5 ND	UG/L	0.03			0.9	0.0				56.	UG/L	479.61			4.0	1.9				37.	UG/L	96.226			3.6	2.0		
MW-6	2 ND	UG/L	0.46			0.6	0.0				2 ND	UG/L	1069			0.6	3.7				2 ND	UG/L	665.14			0.6	2.2		
MW-4	2 ND	UG/L	0.46			0.6	0.0				62.	UG/L	2227.8			4.4	3.1				77.	UG/L	2510.9			4.3	4.7		
PIEZ-1	2 ND	UG/L	0.46			0.6	0.0				53.	UG/L	334.89			3.9	1.7				50.	UG/L	506.67			3.9	3.0		
SHALLOW MW-4	2 ND	UG/L	0.46			0.6	0.0				29.	UG/L	30.25			3.3	0.5				26.	UG/L	3.9619			3.2	1.1		
SHALLOW MW-6	2 ND	UG/L	0.46			0.6	0.0				12.	UG/L	506.25			2.5	0.0				2.0 ND	UG/L	665.14			0.6	2.2		
MW-3	2 ND	UG/L	0.46			0.6	0.0				32.	UG/L	6.25			3.4	0.7				29.	UG/L	2.9224			3.3	1.4		
MW-5	2 ND	UG/L	0.46			0.6	0.0				40.	UG/L	27.04			3.6	1.1				41.	UG/L	193.47			3.7	2.3		
MW DER-2	10.	UG/L	58.0			2.3	2.0				5.50	UG/L	870.25			1.7	0.8				5.0	UG/L	519.40			1.6	0.3		
MW BH-WELL	2 ND	UG/L	0.46			0.6	0.0				2 ND	UG/L	1069			0.6	3.7				2 ND	UG/L	665.14			0.6	2.2		
MW EPA-3	2.5 ND	UG/L	0.03			0.9	0.0				12.4	UG/L	510.76			2.5	0.0				14.	UG/L	166.75			2.6	0.2		
MW EPA-4A	2.5 ND	UG/L	0.03			0.9	0.0				138	UG/L	10609			4.9	5.2				136	UG/L	12146.			4.9	7.5		
MW EPA-5	2.5 ND	UG/L	0.03			0.9	0.0				2.5 ND	UG/L	1056.2			0.9	2.9				2.5 ND	UG/L	639.60			0.9	1.6		
MW EPA-5A	2.5 ND	UG/L	0.03			0.9	0.0				151	UG/L	13456			5.0	5.6				137	UG/L	11926.			4.9	7.4		
MW EPA-6	2.5 ND	UG/L	0.03			0.9	0.0				2.5 ND	UG/L	1056.2			0.9	2.9				2.5 ND	UG/L	639.60			0.9	1.6		
MW-2	2.5 ND	UG/L	0.03			0.9	0.0				52.	UG/L	320.41			3.9	1.7				2.5 ND	UG/L	639.60			0.9	1.6		
MW-2D	2.5 ND	UG/L	0.03			0.9	0.0				44.	UG/L	90.25			3.7	1.3				2.5 ND	UG/L	639.60			0.9	1.6		
MW EPA-1	2.5 ND	UG/L	0.03			0.9	0.0				7.1	UG/L	778.41			1.9	0.4				2.5 ND	UG/L	639.60			0.9	1.6		
MW EPA-2	2.5 ND	UG/L	0.03			0.9	0.0				2.5 ND	UG/L	1056.2			0.9	2.9				2.5 ND	UG/L	639.60			0.9	1.6		
MW EPA-2A	2.5 ND	UG/L	0.03	1.7		0.9	0.0	1.6			2.5 ND	UG/L	1056.2	1.7		0.9	2.9	3.3			2.5 ND	UG/L	639.60	1.7		0.9	1.6	3.3	
	56.		62.1	2.6	3.944	16.	2.3	0.6	0.005		735		37706.	35	51.34	55.	47.	2.6	140.66		583		35187.	27.	45.67	45.	49.	2.1	99.403
	21		20	1.7		21	20	0.3			21		20	49.		21	20	1.5			21		20	41.		21	20	1.5	
---BACKGROUND WELLS---																													
W-5											2 ND	UG/L																	
W-2											2 ND	UG/L																	
W-7											2 ND	UG/L																	
FIELD BLK											2 ND	UG/L																	
SW 1--JL STOLTZFUS											2.5 ND	UG/L																	
SW 2--D STOLTZFUS											2.5 ND	UG/L																	

^INORGANIC CONTAMINANT DATA SUMMARY TABLE

	THALLIUM (FILTERED)					THALLIUM (FILTERED) transformed			
BARKMAN									
SHANKS									
STAGGS									
HOFFMAN									
BLOSENSKI									
HW 1–BANNON	2 ND	UG/L							
HW 2–SHORES	2 UL	UG/L							
HW 3–MANSER	2 UL	UG/L							
HW 4–DEGEZELLE	2 UL	UG/L							
HW 5–FUNK	2 ND	UG/L							
HW 7–SAMUELS	2 UL	UG/L							
HW 8–BEACHY	2 UL	UG/L							
HW 49–BROWN									
HW 10–RAMSEY	1.5 UL	UG/L							
HW 43–HAYES	1.5 UL	UG/L							
HW 46–GRUBB	1.5 UL	UG/L							
HW46D	10 UL	UG/L							
HW30–STOLTZFUS	1.5 UL	UG/L							
HW41D STOLTZFUS	1.5 UL	UG/L							
MW EPA–1A	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–9A	1.5 UL	UG/L	11.3			0.4	0.3		
MW–6	1.5 UL	UG/L	11.3			0.4	0.3		
MW–4	1.5 UL	UG/L	11.3			0.4	0.3		
PIEZ–1	15 UL	UG/L	102.			2.7	2.9		
SHALLOW MW–4	1.5 UL	UG/L	11.3			0.4	0.3		
SHALLOW MW–6	15 UL	UG/L	102.			2.7	2.9		
MW–3	15 UL	UG/L	102.			2.7	2.9		
MW–5	15 UL	UG/L	102.			2.7	2.9		
MW DER–2	1.5 UL	UG/L	11.3			0.4	0.3		
MW SH–WELL	15 UL	UG/L	102.			2.7	2.9		
MW EPA–3	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–4A	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–5	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–5A	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–6	1.5 UL	UG/L	11.3			0.4	0.3		
MW–2	1.5 UL	UG/L	11.3			0.4	0.3		
MW–2D	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–1	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–2	1.5 UL	UG/L	11.3			0.4	0.3		
MW EPA–2A				1.7				2.5	
	97.		663.	4.8	7.199	19.	19.	0.9	8.215
	20		19	5.9		20	19	1.0	
---BACKGROUND WELLS---									
W–6									
W–2									
W–7									
FIELD BLK									
SW 1–JL STOLTZFUS PD									
SW 2–D STOLTZFUS									

^INORGANIC CONTAMINANT DATA SUMMARY TABLE

	COPPER					COPPER transformed				COPPER (FILTERED)					COPPER (FILTERED) transformed				
BARKMAN	251	UG/L																	
SHANKS	139	UG/L																	
STAGGS	51.6 B	UG/L																	
HOFFMAN	25.1 B	UG/L																	
BLOSENSKI	67.6 B	UG/L																	
BANNON, HW 1	1910	UG/L								1350	UG/L								
SHORES, HW 2	121	UG/L								37.6 B	UG/L								
MANSER, HW 3	97.3 B	UG/L								61.5 B	UG/L								
DEGEZELLE, HW 4	115 B	UG/L								61.2 B	UG/L								
FUNK, HW 5	26.9 B	UG/L								18.4 B	UG/L								
SAMUELS, HW 7	16.9 B	UG/L								6.6 B	UG/L								
BEACHY, HW 8	2.5 ND	UG/L								2.5 ND	UG/L								
BROWN, HW 40	127	UG/L																	
RAMSEY, HW 10	101	UG/L								102	UG/L								
HAYES, HW 43	40.4	UG/L								37.9	UG/L								
GRUBB, HW 48	9.4	UG/L								8.9	UG/L								
L. STOLTZFUS, HW 30	107	UG/L								106	UG/L								
D. STOLTZFUS, HW 41	109	UG/L								150	UG/L								
MW EPA-1A	15.6	UG/L	0.18367			2.7	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-6A	32.6	UG/L	303.756			3.4	2.2			3.5 ND	UG/L	0.045918			1.2	0.0			
MW-6	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
MW-4	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
PIEZ-1	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
SHALLOW MW-4	13.9	UG/L	1.61653			2.6	0.4			3 ND	UG/L	0.081632			1.0	0.0			
SHALLOW MW-6	23.9	UG/L	76.1879			3.1	1.3			3 ND	UG/L	0.081632			1.0	0.0			
MW-3	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
MW-5	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
MW DER-2	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
MW BH-WELL	3 ND	UG/L	148.143			1.0	0.8			3 ND	UG/L	0.081632			1.0	0.0			
MW EPA-3	3.5 ND	UG/L	136.222			1.2	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-4A	3.5 ND	UG/L	136.222			1.2	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-5	7.3	UG/L	61.9593			1.9	0.0			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-5A	3.5 ND	UG/L	136.222			1.2	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-6	3.5 ND	UG/L	136.222			1.2	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW-2	62	UG/L	4466.05			4.4	5.8			3.5 ND	UG/L	0.045918			1.2	0.0			
MW-2D	73	UG/L	3344.14			4.2	5.2			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-1	24.1	UG/L	79.7193			3.1	1.4			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-2	3.5 ND	UG/L	136.222			1.2	0.5			3.5 ND	UG/L	0.045918			1.2	0.0			
MW EPA-2A	7.7 ND	UG/L	66.8222	1.7		2.0	0.0	2.5		3.5 ND	UG/L	0.045918	1.7		1.2	0.0	1.7		
	318.		10107.6	15.	28.6837	41.	25.	1.9	26.534	60		1.285714	3.2	3.361	24.	0.1	1.1	3.385388	
	21		20	22.		21	20	1.1		21		20	0.2		21	20	0.0		
===BACKGROUND WELLS===																			
W-5	1.5 ND	UG/L																	
W-2	1.5 ND	UG/L																	
W-7	1.5 ND	UG/L																	
FIELD BLK	1.5 ND	UG/L																	
SW 1-JL STOLTZFUS	3.5 ND	UG/L																	
SW 2-D STOLTZFUS	11.3	UG/L																	

^INORGANIC CU[redacted]NT DATA SUMMARY TABLE

BARKMAN
SHANKS
STAGGS
HOFFMAN
BLOSENSKI
HW 1-BANNON
HW 2-SHORES
HW 3-MANSER
HW 4-DEGEZELLE
HW 5-FUNK
HW 7-SAMUELS
HW 8-BEACHY
HW 49-BROWN
HW 10-RAMSEY
HW 43-HAYES
HW 48-GRUBB
HW48D
HW30-STOLTZFUS
HW41D STOLTZFUS
MW EPA-1A
MW EPA-6A
MW-6
MW-4
PIEZ-1
SHALLOW MW-4
SHALLOW MW-6
MW-3
MW-5
MW DER-2
MW SH-WELL
MW EPA-3
MW EPA-4A
MW EPA-5
MW EPA-5A
MW EPA-6
MW-2
MW-2D
MW EPA-1
MW EPA-2
MW EPA-2A

---BACKGROUND WELLS---

W-5
W-2
W-7
FIELD BLK

SW 1-JL STOLTZFUS PD
SW 2-D STOLTZFUS

AR301861

ORGANIC CONTAMINANT DATA SUMMARY TABLE

	1,2,4-TRICHLOROBENZENE					1,2,4-TRICHLOROBENZENE transformed					1,2,4-TRIMETHYLBENZENE					1,2,4-TRIMETHYLBENZENE transformed					1,2-DICHLOROPROPANE					1,2-DICHLOROPROPANE transformed					1,3,5-TRIMETHYLBENZENE					1,3,5-TRIMETHYLBENZENE transformed				
SHANK																					2.5 ND	UG/L																
STAGGS																					2.5 ND	UG/L																
HOFFMAN																					2.5 ND	UG/L																
BLOSENSKI																					2.5 ND	UG/L																
BARNMAN																					2.5 ND	UG/L																
BANNON, HW1																					2.5 ND	UG/L																
SAMUELS, HW7																					2.5 ND	UG/L																
DEGEZELLE, HW4																					2.5 ND	UG/L																
SHORES, HW2																					2.5 ND	UG/L																
MANSER, HW3																					2.5 ND	UG/L																
FUNK, HW5																					2.5 ND	UG/L																
SEACHY, HW6																					0.5 ND	UG/L																
BROWN																					0.5 ND	UG/L																
RAMSEY, HW-10	2.5 ND	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
L. STOLTZFUS, HW39	2.5 ND	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
D. STOLTZFUS, HW41	0.6 B	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
HAYES, HW-45	2.5 ND	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
GRUSS, HW-46	0.7 J	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
MW EPA-1A	2	UG/L	0.009			0.09	0.6				2.5 ND	UG/L	0.1			0.91	1.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW EPA-9A	2.5 ND	UG/L	0.220			0.91	0.2				2.5 ND	UG/L	0.1			0.91	1.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW-6	2.5 ND	UG/L	0.220			0.91	0.2				0.2 J	UG/L	0.0			-1.6	1.5				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
SHALLOW MW8	0.2 J	UG/L	0.048			-1.6	4.2				0.1 J	UG/L	0.0			-2.5	2.7				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
SHALLOW MW9	0.4 J	UG/L	2.048			-0.9	1.6				2.5 NG	UG/L	0.1			0.91	1.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW-4	2.5 ND	UG/L	0.220			0.91	0.2				0.2 J	UG/L	0.0			-1.6	1.5				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
PIEZOMETER 1	2.5 ND	UG/L	0.220			0.91	0.2				0.2 J	UG/L	0.0			-1.6	1.5				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW-5	2.5 ND	UG/L	0.220			0.91	0.2				0.5 J	UG/L	0.0			-1.3	0.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW DER-2	0.5 J	UG/L	2.002			-1.2	2.7				18.	UG/L	11.0			2.54	0.5				2.5	UG/L	2.5			0.91	2.2				4.00	UG/L	4.0			1.5	1.2		
MW SH-WELL	2.5 ND	UG/L	0.220			0.91	0.2				0.5 J	UG/L	0.0			-1.2	0.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW-8	2.5 ND	UG/L	0.220			0.91	0.2				0.2 J	UG/L	0.0			-1.0	1.5				0.5 J	UG/L	0.0			-0.5	0.0												
MW EPA-9	0.2 B	UG/L	0.048			-1.6	4.2				10.	UG/L	7.0			2.37	7.5				0.4 J	UG/L	0.0			-0.6	0.1				0.50	UG/L	2.2			1.2	0.9		
MW EPA-4A	2.5 ND	UG/L	0.220			0.91	0.2				0.5 J	UG/L	2.5			-0.6	0.1				0.5 ND	UG/L	0.0			-0.6	0.0				0.10 J	UG/L	2.5			-2.	0.6		
MW EPA-8	2.5 ND	UG/L	0.220			0.91	0.2				0.7 J	UG/L	1.0			-0.3	0.0				0.5 ND	UG/L	0.0			-0.6	0.0				0.2 J	UG/L	2.2			-1.	2.5		
MW EPA-8A	2.5 ND	UG/L	0.220			0.91	0.2				5.0	UG/L	1.0			1.36	2.6				0.5 ND	UG/L	0.0			-0.6	0.0				1.30	UG/L	0.6			0.1	0.0		
MW EPA-6	2.5 ND	UG/L	0.220			0.91	0.2				0.2 J	UG/L	0.5			-1.6	1.5				0.5 ND	UG/L	0.0			-0.6	0.0				0.1 J	UG/L	2.5			-2.	0.6		
MW EPA-2	2.5 ND	UG/L	0.220			0.91	0.2				0.4	UG/L	1.7			1.22	2.5				0.5 ND	UG/L	0.0			-0.6	0.0				1.1	UG/L	0.5			0.5	0.0		
MW EPA-8A	2.5 ND	UG/L	0.220			0.91	0.2				0.4 J	UG/L	2.0			-0.9	0.2				0.0 J	UG/L	0.0			-0.2	0.1				2.5 ND	UG/L	0.2			0.0	0.4		
MW-2	2.5 ND	UG/L	0.220			0.91	0.2				0.5 J	UG/L	0.2			-1.2	0.6				0.5 ND	UG/L	0.0			-0.6	0.0				2.5 ND	UG/L	0.2			0.0	0.4		
MW EPA-1	2.5 ND	UG/L	0.220	1.7		0.91	0.2	2.4			0.2 J	UG/L	0.0	1.7		-1.6	1.5	0.911			0.5 ND	UG/L	0.0	1.7		-0.6	0.0	1.0			0.20 J	UG/L	0.2	1.7		-1.	2.5	2.96	
	46.		10.66	2.0	2.661	0.09	10.	0.2	4.975		41.		237	2.0	0.499	-7.3	41.	-0.35	0.572		12.3		2.0	0.0	0.795	-11.	2.0	-0.	0.000		87.		24.	1.0	2.485	0.1	27.	0.27	0.0000000
	39		19	0.0		39	19	0.0			39		19	0.5		39	19	1.469			39		19	0.4		39	19	0.5			19		19	1.1		19	14	1.22	
---BACKGROUND WELLS---																																							
W-6																					2.5 ND	UG/L																
W-2																					2.5 ND	UG/L																
W-7																					2.5 UJ	UG/L																
FIELD BLANK																					2.5 UJ	UG/L																
TRIP BLANK																					2.5 UJ	UG/L																
SW 1-JL STOLTZFUS PD	2.5 ND	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							
SW 2-D STOLTZFUS SW2	0.2 B	UG/L									2.5 ND	UG/L									0.5 ND	UG/L									2.5 ND	UG/L							

ORGANIC CONTAMINANT DATA SUMMARY TABLE

	M&P-XYLENE ISOMERS	M&P-XYLENE ISOMERS *transformed*	P-ISOPROPYLTOLUENE	P-ISOPROPYLTOLUENE *transformed*
SHANK				
STAGGS				
HOFFMAN				
BLOSENSKI				
BARKMAN				
BANNON				
SAMUELS				
DEGEZELLE				
SHORES				
MANSER				
FUNK				
BEACHY				
BROWN				
RAMSEY, HW-10	2.5ND UG/L		2.5ND UG/L	
L. STOLTZFUS, HW80	2.5ND UG/L		2.5ND UG/L	
D. STOLTZFUS, HW41	2.5ND UG/L		2.5ND UG/L	
HAYES, HW-45	2.5ND UG/L		2.5ND UG/L	
GRUSS, HW-46	2.5ND UG/L		2.5ND UG/L	
MW EPA-1A	2.5ND UG/L 110.7	0.01 0.0		
MW EPA-6A	2.5ND UG/L 110.7	0.01 0.0	2.5ND UG/L 0.6	0.01 1.1
MW-6	2.5ND UG/L 110.7	0.01 0.0	2.5ND UG/L 0.6	0.01 1.1
SHALLOW MW-6	2.5ND UG/L 110.7	0.01 0.0	2.5ND UG/L 0.6	0.01 1.1
SHALLOW MW-4	2.5ND UG/L 110.7	0.01 0.0	0.2J UG/L 1.8	-1.6 2.1
MW-4	0.3J MG/L 161.9	-1.2 4.6	2.5ND UG/L 0.6	0.01 1.1
PIEZOMETER 1	2.5ND UG/L 110.7	0.01 0.0	0.0J UG/L 2.1	-2.4 5.1
MW-5	2.5ND UG/L 110.7	0.01 0.0	2.5ND UG/L 0.6	0.01 1.1
MW DER-2	141 UG/L 16377	4.94 16.	5.1 UG/L 2.3	1.13 1.6
MW BH-WELL	0.4B UG/L 158.3	-0.9 3.4	0.1J UG/L 2.1	-2.3 4.7
MW-3	0.6B UG/L 147.0	-0.1 1.0	0.7J UG/L 0.7	-0.3 0.6
MW EPA-3	40. UG/L 1330.	3.96 0.7	0.7J UG/L 0.7	-0.5 0.6
MW EPA-4A	1.1 UG/L 142.2	0.00 0.7	0.1J UG/L 2.1	-2.3 4.7
MW EPA-5	2.8 UG/L 104.5	1.02 0.6	2.5ND UG/L 0.6	0.01 1.1
MW EPA-5A	12. UG/L 0.669	2.49 2.4	0.2J UG/L 1.8	-1.6 2.1
MW EPA-6	0.4J UG/L 158.3	-0.9 3.4		
MW EPA-2	51. UG/L 5467	3.48 6.9	2.7 UG/L 1.2	0.09 1.2
MW EPA-2A	1.5 UG/L 157.4	0.26 0.4	0.4J UG/L 1.8	-0.9 0.6
MW-2	0.6J UG/L 147.0	-0.1 1.0	2.5ND UG/L 0.6	0.01 1.1
MW EPA-1	0.6J UG/L 154.8 1.7	-0.5 2.1 3.5	2.5ND UG/L 0.6 1.7	0.01 1.1 2.066
	360 20146 15. 26.01	18.8 50. 3.5 36.40	26. 23. 1.5 2.086	-2.4 51. -0.13 5.757
	20 19 32.	20 19 1.6	18 17 1.1	18 17 1.007
---BACKGROUND WELLS---				
W-5				
W-2				
W-7				
FIELD BLANK				
TRIP BLANK				
SW 1--JL STOLTZFUS PD	2.5ND UG/L		2.5ND UG/L	
SW 2--D STOLTZFUS	2.5ND UG/L		2.5ND UG/L	

	TOLUENE	TOLUENE *transformed*	TRICHLOROETHYLENE	TRICHLOROETHYLENE *transformed*
SHANK	2.5ND UG/L		2.5ND UG/L	
STAGGS	2.5ND UG/L		2.5ND UG/L	
HOFFMAN	2.5ND UG/L		2.5ND UG/L	
BLOSENSKI	2.5ND UG/L		2.5ND UG/L	
BARKMAN	2.5ND UG/L		2.5ND UG/L	
BANNON	2.5ND UG/L		2.5ND UG/L	
SAMUELS	2.5ND UG/L		1J UG/L	
DEGEZELLE	2.5ND UG/L		2.5ND UG/L	
SHORES	2.5ND UG/L		2.5ND UG/L	
MANSER	2.5ND UG/L		2.5ND UG/L	
FUNK	0.5ND UG/L		0.5ND UG/L	
BEACHY	0.5ND UG/L		1 UG/L	
BROWN	0.5ND UG/L		0.5ND UG/L	
RAMSEY, HW-10	0.5ND UG/L		0.5ND UG/L	
L. STOLTZFUS, HW80	0.5ND UG/L		0.5ND UG/L	
D. STOLTZFUS, HW41	0.5ND UG/L		0.5ND UG/L	
HAYES, HW-45	0.5ND UG/L		0.5ND UG/L	
GRUSS, HW-46	0.5ND UG/L		0.5ND UG/L	
MW EPA-1A	0.5ND UG/L 4.2	-0.6 0.8	0.5ND UG/L 0.0	-0. 0.0
MW EPA-6A	0.5ND UG/L 4.2	-0.6 0.6	0.5ND UG/L 0.0	-0. 0.0
MW-6	2.1 UG/L 0.2	0.74 0.2	1.5 UG/L 0.0	0.4 0.0
SHALLOW MW-6	0.20J UG/L 5.5	-1.6 3.3	0.5ND UG/L 0.0	-0. 0.0
SHALLOW MW-4	0.5ND UG/L 4.2	-0.6 0.9	0.6J UG/L 0.0	-0. 0.0
MW-4	3.3 UG/L 0.5	1.19 0.9	0.5J UG/L 0.0	-0. 0.0
PIEZOMETER 1	2.00 UG/L 0.9	0.60 0.2	0.5J UG/L 0.0	-0. 0.0
MW-5	1.40 UG/L 1.3	0.33 0.6	0.5ND UG/L 0.0	-0. 0.0
MW DER-2	12.80 UG/L 107	2.56 5.4	0.5ND UG/L 0.0	-0. 0.0
MW BH-WELL	0.70J UG/L 3.4	-0.3 0.8	0.5ND UG/L 0.0	-0. 0.0
MW-3	1.1 UG/L 2.1	0.00 0.6	0.5ND UG/L 0.0	-0. 0.0
MW EPA-3	0.5ND UG/L 4.2	-0.6 0.8	0.5ND UG/L 0.0	-0. 0.0
MW EPA-4A	0.7J UG/L 3.4	-0.3 0.3	0.5ND UG/L 0.0	-0. 0.0
MW EPA-5	6.5 UG/L 56.	2.14 8.6	1.7 UG/L 1.0	0.8 1.1
MW EPA-5A	1.80 UG/L 1.1	0.40 0.0	0.5J UG/L 0.0	-0. 0.0
MW EPA-6	0.5ND UG/L 4.2	-0.6 0.8	1.2 UG/L 0.2	0.1 0.4
MW EPA-2	10.70 UG/L 66.	2.87 4.6	0.5ND UG/L 0.0	-0. 0.0
MW EPA-2A	0.60J UG/L 4.2	-0.6 0.9	0.5ND UG/L 0.0	-0. 0.0
MW-2	2.40 UG/L 0.6	0.67 0.4	0.5ND UG/L 0.0	-0. 0.0
MW EPA-1	0.60J UG/L 3.6 1.7	-0.5 0.5 2.6	0.5ND UG/L 0.0 1.7	-0. 0.0 1.00
	81.1 205 2.5 0.878	4.41 25. 0.2 4.776	15. 2.5 0.6 0.766	-10 3.5 -0.5 0.7567676
	20 19 3.6	20 19 1.1	20 19 0.3	20 19 0.40
---BACKGROUND WELLS---				
W-5	2.5ND UG/L		2.5ND UG/L	
W-2	2.5ND UG/L		2.5ND UG/L	
W-7	2.5UL UG/L		2.5UL UG/L	
FIELD BLANK	2.5UL UG/L		2.5UL UG/L	
TRIP BLANK	2.5UJ UG/L		2.5UJ UG/L	
SW 1--JL STOLTZFUS PD	0.5ND UG/L		0.5ND UG/L	
SW 2--D STOLTZFUS	0.5ND UG/L		0.5ND UG/L	

AR301863

ORGANIC CONTAMINANT DATA SUMMARY TABLE

	1,4-DICHLOROBENZENE				1,4-DICHLOROBENZENE transformed				1,4-DICHLOROBENZENE (DUP)				1,4-DICHLOROBENZENE (DUP) transformed				BENZENE				BENZENE transformed				BIS(2-ETHYLHEXYL)PHTHALATE				BIS(2-ETHYLHEXYL)PHTHALATE transformed			
SHANK																	2.5 ND	UG/L													
STAGGS																	2.5 ND	UG/L													
HOFFMAN																	1 J	UG/L													
BLOSENSKI																	2.5 ND	UG/L													
BARNHART																	2.5 ND	UG/L													
BANNON, HW1	0.5 ND	UG/L															2.5 ND	UG/L													
SAMUELS, HW7	0.5 ND	UG/L															2	UG/L													
DEGEZELLE, HW4	0.5 ND	UG/L															2.5 ND	UG/L													
SHORES, HW2	0.5 ND	UG/L															2.5 ND	UG/L													
MANSER, HW8	0.5 ND	UG/L															2.5 ND	UG/L													
FUNK, HW9	0.5 ND	UG/L															0.5 ND	UG/L													
BEACHY, HW6	0.5 J	UG/L															0.5 ND	UG/L													
BROWN	0.5	UG/L															0.5 ND	UG/L													
RAMSEY, HW-10	2.5 ND	UG/L							2.5 ND	UG/L							0.5 ND	UG/L													
L. STOLTZFUS, HW20	2.50 ND	UG/L							0.07 J	UG/L							0.5 ND	UG/L								5 ND	UG/L				
D. STOLTZFUS, HW21	2.50 ND	UG/L							0.10 J	UG/L							0.5 ND	UG/L								5 ND	UG/L				
HAYES, HW-48	2.50 ND	UG/L							0.10 J	UG/L							0.5 ND	UG/L								5 ND	UG/L				
GRUBB, HW-49	2.5 ND	UG/L							2.5 ND	UG/L							0.5 ND	UG/L								5 ND	UG/L				
MW EPA-1A									2.5 ND	UG/L	0.1		0.91	0.1			0.5 J	UG/L	0.9		-0.0	1.4								
MW EPA-6A	2.00 J	UG/L	0.0		0.00	0.0			0	UG/L	0.0		1.00	0.2			2.5	UG/L	0.1		0.01	0.1				5 J	UG/L	0.1		1.7	0.0
MW-6	2.5 ND	UG/L	0.1		0.01	0.1			0.4 J	UG/L	0.2		-0.0	2.2			0.4 J	UG/L	0.4		-0.0	2.0				5 J	UG/L	0.1		1.7	0.0
SHALLOW MW8	2.50 ND	UG/L	0.1		0.01	0.1			2.2	UG/L	0.0		1.10	0.0			2.7	UG/L	0.0		0.00	0.2				5 J	UG/L	0.1		1.7	0.0
SHALLOW MW4	2.50 J	UG/L	0.0		0.00	0.0			0.4 J	UG/L	0.2		-0.0	2.2			0.5 J	UG/L	7.5		-1.3	4.0				5 J	UG/L	2.4		2.0	0.2
MW-4	0.50 J	UG/L	1.4		-0.1	0.4			1.2	UG/L	2.0		0.10	0.1			1.1	UG/L	0.3		0.00	0.1				5 J	UG/L	2.0		1.0	0.0
PIEZOMETER 1	0.70 J	UG/L	2.0		-0.0	0.0			1.2	UG/L	2.0		0.10	0.1			1.2	UG/L	0.0		0.10	0.1				5 J	UG/L	11.		1.0	0.1
MW-5	1.00 J	UG/L	1.2		0	0.0			2.2	UG/L	0.4		0.70	0.0			0	UG/L	0.0		1.00	0.0				7 J	UG/L	0.0		1.0	0.1
MW DSR-2	0.00 J	UG/L	94.		2.07	2.2			14.	UG/L	182		2.04	4.2			11.0	UG/L	78.		2.00	3.9				10.5	UG/L	82.		2.7	1.4
MW SH-WELL	1.50 J	UG/L	1.2		0	0.0			1.0	UG/L	2.5		0.00	0.1			2.2	UG/L	0.0		0.70	0.0				5 J	UG/L	11.		1.0	0.1
MW-9	0.00 J	UG/L	0.7		1.00	0.2			0.0	UG/L	0.4		1.75	1.0			0.1	UG/L	0.0		2.00	2.5				5 ND	UG/L	2.0		1.0	0.0
MW EPA-8	4.00 J	UG/L	0.0		1.00	0.0			0.7	UG/L	14.		1.00	1.7			0	UG/L	25.		2.07	2.4				2.5	UG/L	19.		0.0	0.7
MW EPA-4A	3.00 J	UG/L	0.7		1.00	0.2			4.0	UG/L	0.0		1.04	0.0			4.4	UG/L	2.1		1.40	0.0				2.5	UG/L	19.		0.0	0.7
MW EPA-5	0.4 J	UG/L	2.0		-0.0	2.2			0.0 J	UG/L	0.2		-0.5	1.2			0.0 J	UG/L	0.4		-0.5	1.0				5.5	UG/L	2.0		1.0	0.0
MW EPA-5A	1.00 J	UG/L	1.2		0	0.0			2	UG/L	0.0		0.00	0.0			0.2	UG/L	0.0		1.10	0.4				0.35	UG/L	37.		-1.	7.4
MW EPA-6	0.00 J	UG/L	1.4		-0.1	0.4			1.7	UG/L	1.4		0.50	0.0			1.7	UG/L	1.5		0.50	0.0				4.5	UG/L	0.0		1.5	0.0
MW EPA-2	2.00 J	UG/L	0.0		0.00	0.0			2.0	UG/L	0.0		0.05	0.1			4.0	UG/L	2.4		1.50	1.0				20.4	UG/L	402		0.5	3.2
MW EPA-2A	2.50 ND	UG/L	0.1		0.01	0.1			1.0	UG/L	2.5		0.20	0.1			2	UG/L	0.0		0.00	0.0				2.5	UG/L	19.		0.0	0.7
MW-2	2.5 ND	UG/L	0.1		0.01	0.1			2.5 ND	UG/L	0.1		0.01	0.1			0.2 J	UG/L	7.0		-1.0	4.4				10.0	UG/L	82.		2.7	1.4
MW EPA-1	2.50 ND	UG/L	0.1	1.7	0.01	0.1	2.1		0.2 J	UG/L	7.2	1.7	-1.0	4.0	2.5		0.5 J	UG/L	5.0	1.7	-0.0	1.4	2.5			5.5	UG/L	2.0	1.7	1.0	0.0	0.4
	42.		82.	2.1	10.0	0.1	0.5	0.000	98		187	2.0	4.147	11.0	20.	0.5	0.7705	98.5		183	2.0	4.140		10.0	27.	0.5	0.040	120.		702	0.4	0.010	20.	10.	1.5	12.07
	20		10	1.0	10	10	0.7		20		10	0.2		20	10	1.0		20		10	0.1			20	10	1.1		20		10	0.4		10	10	0.0	
---BACKGROUND WELLS---																																			
W-5																	2.5 ND	UG/L													
W-2																	2.5 ND	UG/L													
W-7																	2.5 UL	UG/L													
FIELD BLANK																	2.5 UL	UG/L													
TRIP BLANK																	2.5 UJ	UG/L													
SW 1-J STOLTZFUS FD	2.5 ND	UG/L							2.5 ND	UG/L							0.5 ND	UG/L								5 ND	UG/L				
SW 2-D STOLTZFUS SW2	2.5 ND	UG/L							2.5 ND	UG/L							0.5 ND	UG/L								5 ND	UG/L				

ORGANIC CONTAMI[illegible]TA SUMMARY TABLE

	TETRACHLOROETHYLENE					TETRACHLOROETHYLENE *transformed*				VINYL CHLORIDE					VINYL CHLORIDE *transformed*			
SHANK	2.5 ND	UG/L								5 ND	UG/L							
STAGGS	2.5 ND	UG/L								5 ND	UG/L							
HOFFMAN	2.5 ND	UG/L								5 ND	UG/L							
SLOSEMAN	2.5 ND	UG/L								5 ND	UG/L							
BARGMAN	2.5 ND	UG/L								5 ND	UG/L							
BANNON	2.5 ND	UG/L								5 ND	UG/L							
SAMUELS	2.5 ND	UG/L								5 UJ	UG/L							
DSOEZELLE	2.5 ND	UG/L								5 ND	UG/L							
SHORES	2.5 ND	UG/L								5 UJ	UG/L							
MANSER	2.5 ND	UG/L								5 UJ	UG/L							
FUNK	2.5 ND	UG/L								5 ND	UG/L							
BEACHY	5	UG/L								0.5 UJ	UG/L							
BROWN	0.5 ND	UG/L								0.5 UJ	UG/L							
RAMSEY, HW-10	0.5 ND	UG/L								0.5 ND	UG/L							
L. STOLTZFUS, HW69	0.5 ND	UG/L																
D. STOLTZFUS, HW41	0.5 ND	UG/L																
HAYES, HW-48	0.5 ND	UG/L																
GRUSS, HW-46	0.5 ND	UG/L																
MW EPA-1A	0.5 ND	UG/L	0.0			-0.6	0.0											
MW EPA-9A	0.5 ND	UG/L	0.0			-0.6	0.0											
MW-6	1.6	UG/L	0.0			0.40	1.2											
SHALLOW MW-6	0.5 ND	UG/L	0.0			-0.6	0.0											
SHALLOW MW-5	0.5 J	UG/L	0.0			-0.6	0.0											
MW-4	0.3 J	UG/L	0.0			-1.2	0.2											
PIEZOMETER 1	0.3 J	UG/L	0.0			-1.2	0.2											
MW-5	0.5 ND	UG/L	0.0			-0.6	0.0											
MW DSR-2	0.5 ND	UG/L	0.0			-0.6	0.0											
MW SH-WELL	0.5 ND	UG/L	0.0			-0.6	0.0											
MW-3	0.5 ND	UG/L	0.0			-0.6	0.0											
MW EPA-3	0.5 ND	UG/L	0.0			-0.6	0.0											
MW EPA-4A	0.1 J	UG/L	0.2			-2.3	2.4											
MW EPA-8	1.6	UG/L	1.0			0.47	1.4											
MW EPA-8A	0.4 J	UG/L	0.0			-0.9	0.0											
MW EPA-6	1.4	UG/L	0.0			0.33	1.1											
MW EPA-2	0.5 ND	UG/L	0.0			-0.6	0.0											
MW EPA-2A	0.3 J	UG/L	0.0			-1.2	0.2											
MW-2	0.3 J	UG/L	0.0			-1.2	0.2											
MW EPA-1	0.5 ND	UG/L	0.0	1.7		-0.6	0.0	2.0				0			0			
	11.		3.2	0.5	0.745	-14.	7.2	-0.	0.761	0		0	0	0	0	0	0	0
	39		19	0.4		39	19	0.6		0		-1	0		0	-1	0	
---BACKGROUND WELLS---																		
W-5	2.5 ND	UG/L																
W-2	2.5 ND	UG/L																
W-7	2.5 UL	UG/L																
FIELD BLANK	2.5 UL	UG/L																
TRIP BLANK	2.5 UJ	UG/L																
SW 1-JL STOLTZFUS PD	0.5 ND	UG/L																
SW 2-D STOLTZFUS	0.5 ND	UG/L																

ORGANIC CONTAM... . DATA SUMMARY TABLE

	CHLOROBENZENE					CHLOROBENZENE transformed					CHLOROFORM					CHLOROFORM transformed					CHLOROMETHANE					CHLOROMETHANE transformed					CIS-1,2-DICHLOROETHENE					CIS-1,2-DICHLOROETHENE transformed				
SHANK	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								0.5	ND	UG/L							
STAGGS	2.5	ND	UG/L								99		UG/L								5	ND	UG/L								0.5	J	UG/L							
HOFFMAN	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								0.5	ND	UG/L							
SLOSBINSKI	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								0.5	ND	UG/L							
SARIGIAN	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								1		UG/L							
SANNON, HW1	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								0.5	ND	UG/L							
SAMUELS, HW7	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								1		UG/L							
DEGEZELLE, HW6	2.5	ND	UG/L								2.5	ND	UG/L								5	ND	UG/L								0.5	ND	UG/L							
SHORES, HW2	2.5	ND	UG/L								2.5	ND	UG/L								0.5	UJ	UG/L								0.5	ND	UG/L							
MANSER, HW5	2.5	ND	UG/L								2.5	ND	UG/L								0.5	J	UG/L								0.5	ND	UG/L							
FUNK, HW8	0.5	ND	UG/L								0.5	ND	UG/L								0.5	J	UG/L								0.5	ND	UG/L							
BEACHY, HW9	0.5	ND	UG/L								0.5	ND	UG/L								0.5	UJ	UG/L								0.5	ND	UG/L							
BROWN	0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
RAMSEY, HW-10	0.5	ND	UG/L								0.2	B	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
L. STOLTZFUS, HW39	0.5	ND	UG/L								1.1	B	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
D. STOLTZFUS, HW41	0.5	ND	UG/L								0.1	B	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
HAYES, MW-45	0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
GRUBB, MW-46	0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L								0.5	J	UG/L							
MW EPA-1A	0.5	ND	UG/L	0.5							0.5	ND	UG/L	0.00							0.5	ND	UG/L	0							0.5	ND	UG/L	0.2						
MW EPA-9A	2.10		UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.5	J	UG/L	0.2			-0.6	0.2		
MW-6	0.5	ND	UG/L	0.5			0.74	1.0			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			1.2		UG/L	0.2			0.18	0.1		
SHALLOW MW9	1.90		UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.7	J	UG/L	0.0			-0.3	0.0		
SHALLOW MW4	0.5	J	UG/L	0.5			0.64	0.9			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.4	J	UG/L	0.0			-0.5	0.0		
MW-4	0.50	J	UG/L	0.5			-1.2	0.6			0.2	B	UG/L	0.04			-1.6	0.4			0.5	ND	UG/L	0			-0.6	0			0.8	J	UG/L	0.0			-0.2	0.0		
PIEZOMETER 1	0.50	J	UG/L	0.5			-1.2	0.6			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.8	J	UG/L	0.0			-0.2	0.0		
MW-5	1.40		UG/L	0.5			0.83	0.9			0.2	B	UG/L	0.04			-1.6	0.4			0.5	ND	UG/L	0			-0.6	0			0.7	J	UG/L	0.0			-0.3	0.0		
MW DER-2	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			1.1		UG/L	0.0			0.06	0.0		
MW SH-WELL	2.70		UG/L	2.4			0.99	1.0			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.5	ND	UG/L	0.2			-0.6	0.2		
MW-9	8.90		UG/L	7.7			1.86	2.7			0.3	B	UG/L	0.01			-1.2	0.6			0.5	ND	UG/L	0			-0.6	0			0.4	J	UG/L	0.3			-0.5	0.5		
MW EPA-5	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.7	J	UG/L	0.0			-0.3	0.0		
MW EPA-4A	4.10		UG/L	0.5			1.41	2.0			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			1		UG/L	0.0			0	0.0		
MW EPA-8	0.5	ND	UG/L	0.5			-0.6	0.1			0.2	B	UG/L	0.04			-1.6	0.4			0.5	ND	UG/L	0			-0.6	0			2.8		UG/L	3.2			1.02	1.4		
MW EPA-8A	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			1.5		UG/L	0.2			0.40	0.5		
MW EPA-3	0.5	J	UG/L	0.5			-0.6	0.1			0.3	B	UG/L	0.01			-1.2	0.6			0.5	ND	UG/L	0			-0.6	0			1.2		UG/L	0.0			0.18	0.1		
MW EPA-2	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			1.3		UG/L	0.0			0.26	0.2		
MW EPA-3A	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			2.9		UG/L	3.6			1.06	1.5		
MW-2	0.5	ND	UG/L	0.5			-0.6	0.1			0.5	ND	UG/L	0.00			-0.6	0.0			0.5	ND	UG/L	0			-0.6	0			0.5	ND	UG/L	0.2			-0.6	0.2		
MW EPA-1	0.5	ND	UG/L	0.5	1.7		-0.6	0.1	2.43		0.5	ND	UG/L	0.00	1.7		-0.6	0.0	1.8		0.5	ND	UG/L	0	1.7		-0.6	0	0		0.4	J	UG/L	0.3	1.7		-0.6	0.5	1.9	
	22.			20.	1.1	1.998	-0.7	13.	-0.2	1.741	0.4			0.31	0.4	0.488	-16.	2.7	-0.	0.488	10			0	0.5	0.5	-15.	0	-0.5	0.5	16.			0.7	0.9	1.271	-3.6	0.5	-0.	1.998
	20			10	1.1		20	10	0.66		20			10	0.1		20	10	0.5		20			10	0		20	10	0		20			10	0.7		20	10	0.5	
---BACKGROUND WELLS---																																							
W-8	2.5	ND	UG/L								2.5	ND	UG/L								5	UJ	UG/L																	
W-2	2.5	ND	UG/L								2.5	ND	UG/L								5	UJ	UG/L																	
W-7	2.5	UL	UG/L								13	B	UG/L								5	UL	UG/L																	
FIELD BLANK	2.5	UL	UG/L								5	L	UG/L								5	UL	UG/L																	
TRIP BLANK	2.5	UJ	UG/L								2.5	UJ	UG/L								5	UJ	UG/L																	
SW 1-JL STOLTZFUS FD	0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L								0.5	ND	UG/L							
SW 2-D STOLTZFUS SW2	0.5	ND	UG/L								0.5	ND	UG/L								1.8		UG/L								0.5	ND	UG/L							

ORGANIC CONTAMINANT DATA SUMMARY TABLE

ORGANIC CONTAMINANT DATA SUMMARY TABLE

	DICHLORODIFLUOROMETHANE					DICHLORODIFLUOROMETHANE *transformed*					ETHYL BENZENE					ETHYL BENZENE *transformed*					GAMMA BHC (LINDANE)					GAMMA BHC (LINDANE) *transformed*					ISOPROPYLBENZENE					ISOPROPYLBENZENE *transformed*				
SHANK																																							
STAGGS											2.5	ND	UG/L																										
HOFFMAN											2.5		UG/L																										
BLOEMSMA											2.5	ND	UG/L																										
BARIGIAN											2.5	ND	UG/L																										
BANNON, HW1											2.5	ND	UG/L																										
SAMUELS, HW7											2.5	ND	UG/L																										
DEGEZELLE, HW4											2.5	ND	UG/L																										
SHORES, HW2											2.5	ND	UG/L																										
MANSER, HW3											2.5	ND	UG/L																										
FUNK, HW6											0.5	ND	UG/L																										
BEACHY, HW8											0.5	ND	UG/L																										
BROWN																																						
RAMSEY, HW-10																																						
L. STOLTZFUS, HW39	1.7		UG/L								0.5	ND	UG/L									0.025	ND	UG/L								2.5	ND	UG/L					
D. STOLTZFUS, HW41	2.5	ND	UG/L								0.5	ND	UG/L									0.025	ND	UG/L								2.5	ND	UG/L					
HAYES, HW-45																																						
GRUBB, HW-46	10.5		UG/L								0.5	ND	UG/L									0.025	ND	UG/L								2.5	ND	UG/L					
MW EPA-1A	2.5	ND	UG/L	91.		0.9	0.7				0.5	ND	UG/L	71.7		-0.6	1.9														2.5	ND	UG/L	0.0		0.9	0.3	
MW EPA-8A																																						
MW-9																																						
SHALLOW MW9	51.1	J	UG/L	527		3.4	2.8				0.1	J	UG/L	78.8		-2.3	0.9				0.025	ND	UG/L	0.00		-3.	0.0				0.2	ND	UG/L	3.0		-1.	3.8	
SHALLOW MW6	11.0	J	UG/L	10.		2.4	0.8				0.5	ND	UG/L	71.7		-0.6	1.0				0.025	ND	UG/L	0.00		-3.	0.0				1.9		UG/L	0.0		0.6	0.0	
MW-4	7.3	J	UG/L	0.0		1.0	0.0				0.3	J	UG/L	76.1		-1.2	2.5				0.025	ND	UG/L	0.00		-3.	0.0				0.3	J	UG/L	3.5		-1.	2.3	
PIEZOMETER 1	15.1	J	UG/L	40.		2.7	0.8				0.5	ND	UG/L	71.7		-0.6	1.0				0.025	ND	UG/L	0.00		-3.	0.0				0.3	J	UG/L	2.5		-0.	1.0	
MW-5																																						
MW DSR-2	0.5	J	UG/L	2.0		1.0	0.0				0.5	ND	UG/L	71.7		-0.6	1.0				0.025	ND	UG/L	0.00		-3.	0.0				0.4	J	UG/L	0.1		-0.	1.5	
MW SH-WELL	2.5	UJ	UG/L	91.		0.9	0.7				71.7		UG/L	6664		4.27	19.				0.025	ND	UG/L	0.00		-3.	0.0				0.4		UG/L	10.		1.0	1.0	
MW-3	2.5	UJ	UG/L	91.		0.9	0.7				0.7	J	UG/L	68.4		-0.9	0.4				0.025	ND	UG/L	0.00		-3.	0.0				0.5	J	UG/L	2.0		-0.	1.0	
MW EPA-9	2.5	ND	UG/L	91.		0.9	0.7				41.5		UG/L	1068		3.72	11.																						
MW EPA-4A	0.1		UG/L	4.0		1.5	0.0				1.9		UG/L	90.9		0.26	0.9				0.138		UG/L	0.00		-1.	2.0				0.9		UG/L	22.		1.9	2.5	
MW EPA-5	10.5		UG/L	66.		2.7	1.0				1.5		UG/L	58.9		0.40	0.0				0.025	ND	UG/L	0.00		-3.	0.0				0.5		UG/L	2.5		1.3	0.9	
MW EPA-5A	7.7		UG/L	0.1		2.0	0.0				10.2		UG/L	1.51		2.92	0.0				0.025	ND	UG/L	0.00		-3.	0.0				2.5	ND	UG/L	0.0		0.0	0.3	
MW EPA-6	15.3			30.		2.5	0.5				0.5	ND	UG/L	71.7		-0.6	1.0				0.025	ND	UG/L	0.00		-3.	0.0				2.0		UG/L	0.1		0.0	0.3	
MW EPA-2	2.5	ND	UG/L	91.		0.9	0.7				19.6		UG/L	112.		2.07	7.0														1.5		UG/L	0.4		0.4	0.0	
MW EPA-3A	5.4		UG/L	7.4		1.5	0.0				2.3		UG/L	44.4		0.80	0.2				0.147		UG/L	0.01		-1.	2.3				1		UG/L	1.4		0	0.1	
MW-2	2.5	ND	UG/L	91.		0.9	0.7				0.3	J	UG/L	76.1		-1.2	2.3				0.025	ND	UG/L	0.00		-3.	0.0				2.5	ND	UG/L	0.0		0.9	0.3	
MW EPA-1	2.5	ND	UG/L	91.	1.7	0.9	0.7	2.4			0.5	ND	UG/L	71.7	1.7	-0.6	1.0	4.0			0.025	ND	UG/L	0.00	1.77	-3.	0.0	2.1			2.5	ND	UG/L	0.0	1.7	0.9	0.3	2.7	
	134.			920	0.1	11.864	29.	11.	1.7	10.8815	152			8994	0.9	17.16	9.57	56.	0.3	80.6666	0.565			0.02	0.04	0.001	-48	5.1	-5.	0.667	34			54	2.1	0.815	3.5	17.	0.3	5.56
	17			16	7.5		17	16	0.9		17			16	19.		17	16	1.9		14			15	0.04		14	15	0.9		16			15	1.9		16	15	1.9	
---=BACKGROUND WELLS=---																																						
W-6																																						
W-2											2.5	ND	UG/L																										
W-7											2.5	ND	UG/L																										
FIELD BLANK											2.5	UL	UG/L																										
TRIP BLANK											2.5	UL	UG/L																										
SW 1-JL STOLTZFUS FD																																						
SW 2-D STOLTZFUS SW2	7.1		UG/L								0.5	ND	UG/L																		1.7		UG/L					

ORGANIC CONTAMINANT DATA SUMMARY TABLE

APPENDIX E
Site Base Map

EPA REGION III
SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOC ID 134327
PAGE # AR 301871

IMAGERY COVER SHEET
UNSCANNABLE ITEM

SITE NAME Welsh Road Landfill

OPERABLE UNIT OU2

ADMINISTRATIVE RECORDS- SECTION III VOLUME C

REPORT OR DOCUMENT TITLE Final Feasibility Study (FS) - Volume I

DATE OF DOCUMENT 11/15/93

DESCRIPTON OF IMAGERY Site Base Map

NUMBER AND TYPE OF IMAGERY ITEM(S) 1 Oversized Map

APPENDIX F
Northwestern Chester County Municipal Authority
Rates, Charges, User Rules and Regulations

- CONTENTS -

NORTHWESTERN CHESTER COUNTY MUNICIPAL AUTHORITY

RESOLUTION OF NORTHWESTERN CHESTER COUNTY MUNICIPAL AUTHORITY IMPOSING RATES AND CHARGES WITH RESPECT TO THE AUTHORITY'S SEWER SYSTEM; AND ESTABLISHING RULES AND REGULATIONS IN CONNECTION WITH SAID SEWER SYSTEM.

WHEREAS, Northwestern Chester County Municipal Authority has, at the request of the Borough of Honey Brook and the Township of Honey Brook, undertaken to construct a sewage collection system, together with a sewage treatment plant; and

WHEREAS, the Authority desires to establish a schedule of sewer charges and rules and regulations in regard to the sewer system.

NOW THEREFORE, the Authority hereby resolves as follows:

Section 1. Definitions. Unless the context specifically indicates otherwise, the meaning of terms used in this Ordinance shall be as follows:

(a) "Authority" means Northwestern Chester County Municipal Authority.

(b) "BOD" (Biochemical Oxygen Demand) means the quantity of oxygen expressed in parts per million (milligrams per liter) by weight, utilized in the biochemical oxidation of organic matter under laboratory procedure for five days at 20 degrees centigrade. The standard laboratory procedure shall be that found in the latest revised edition of Standard Methods.

(c) "Borough" means the Borough of Honey Brook, Chester County, Pennsylvania.

(d) "Chlorine Demand" means the amount of Chlorine in parts per million (milligrams per liter) by weight, which must be added to the wastewater to produce a specified residual chlorine content or to meet the requirements of some other objective, in accordance with procedures set forth in Standard Methods.

(e) "Commercial and Institutional Establishment" means any structure or store, office or other unit thereof intended to be used wholly or in part for the purposes of carrying on a trade, business or profession or for social, amusement, education, charitable or public use.

(f) "Consulting Engineer" means the engineer retained by the Authority. Such engineer shall be versed in environmental engineering.

(g) "Garbage" means the solid waste from the domestic and commercial preparation, cooking and disposal of food, and from the handling, storage and sale of produce.

(h) "Industrial Establishment" means any structure or separate unit thereof intended to be used wholly or in part for the manufacturing, fabricating, processing, cleaning, laundering or assembly of any product, commodity or article.

(i) "Non-Domestic Waste" means any pollutant or waste substance (solid, liquid or gaseous) or form of energy rejected or escaping from any industrial, manufacturing, trade or business process or from the development, recovery or processing of natural resources and distinct from Sanitary Sewage or Domestic Waste.

(j) "pH" means the logarithm of the reciprocal of the hydrogen-ion concentration expressed in moles per liter and indicates the degree of acidity or alkalinity of a substance.

(k) "PPM" (parts per million) means milligrams per liter, or weight to weight ratio: the parts per million multiplied by the factor 8.345 shall be equivalent to pounds per million gallons of water.

(l) "Person" means any individual, group, company, association, society or corporation applying for permission to connect or use the Sewer System.

(m) "Private Dwelling" means any structure intended to be occupied as a whole by one family.

(n) "Sanitary Sewage or Domestic Waste" means the domestic waste or normal non-process wastewater carried from households and toilet wastes from residences, business buildings, institutions, Commercial, Institutional and Industrial Establishments.

(o) "Sanitary Sewers" means the system of pipes and facilities operated or caused to be operated by the Authority for the collection of sanitary sewage or domestic waste and acceptable non-domestic wastes in and for the areas served by the Authority.

(p) "Sewer Manager" means any person who may, from time to time, be placed in general charge of the Sewer System.

(q) "Sewer System" means all facilities operated or caused to be operated by the Authority for the collection, disposal, and treatment of Sanitary Sewage or Domestic Waste and acceptable Non-Domestic Waste in and for the Borough and the Township.

(r) "Sewage Treatment Works" means all the facilities of the Authority for collecting, pumping, treating and disposing of Sanitary Sewage or Domestic Waste and acceptable Non-Domestic Waste.

(s) "Shall" is mandatory. "May" is permissive.

(t) "Slug" means any discharge of sewage or waste exceeding a concentration or flow greater than five times that of an average 24-hour discharge, which is discharged for a period of 15 minutes or more.

(u) "Standard Methods" means the laboratory and analytical procedures as set forth in the latest revised edition of "Standard Methods for the Examination of Water and Wastewater" as published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation.

(v) "Surcharge" means the additional charge in excess of the basic charge and never less than the basic charge for the treatment of Non-Domestic Waste, based upon the extra strength of waste applied as a factor against charges for Sanitary Sewage or Domestic Waste.

(w) "Suspended Solids" means the solids that either float on the surface or are in suspension in water, sewage or other liquids which are removed by laboratory filtration.

(x) "Township" means the Township of Honey Brook, Chester County, Pennsylvania.

(y) "User" means any person who contributes, causes or permits the contribution of Sanitary Sewage or Domestic Waste or Non-Domestic Waste into the Sewer System.

(z) "Water Company" means the Honey Brook Borough Authority where providing water service to customers connected to the Sewer System.

Section 2. Imposition of Sewer Rent or Charge. There is hereby imposed upon each property served by the Sewer System and having the use thereof, sewer rents or charges payable as hereinafter provided, for the use, whether direct or indirect, of the Sewer System, based on the schedules of classifications and rates hereinafter set forth in the Rate Schedule (see Appendix).

Section 3. Flat Rates for Certain Classifications.

Customer Classification		Rental
(a)	Each private dwelling or living unit (including each mobile home space, row house, semi-detached house and townhouse and individual dwelling units within multiple dwelling buildings).	65.00 ~~$70.00~~ per three-month period
(b)	Each firehouse, church or municipal building	65.00 ~~$70.00~~ per three-month period.

In case of a combination of one or more Commercial, Industrial or Institutional Establishments, Private Dwellings (including each mobile home space, row house, semi-detached house and townhouse and individual dwelling units within a multiple dwelling building), fire house, church, school or

municipal building in one property all having the use of the Sewer System through one sewer connection, then each such establishment shall be charged the above mentioned base charge as though each were separately connected to the Sewer System, and if there is only one water meter for any such combination, the Authority may estimate the amount of water used by each individual establishment if necessary for the purpose of establishing additional sewer rental charges imposed by Section 4 hereof.

Charges for connection to the Sewer System are hereby fixed in accordance with ordinances of the Borough and Township with respect thereto at the attached rate schedule (see Appendix).

Section 4. Additional Sewer Rates or Charges.

(a) Meter Rates. For all properties located within the Borough or the Township served by the Sewer System and having available to it the use thereof, other than (1) private dwellings (including each mobile home space, row house, semi-detached house and townhouse and individual dwelling unit within a multiple dwelling building), (2) fire houses, (3) churches and (4) municipal buildings, there is hereby imposed the charges fixed under Section 3 hereof and an additional sewer rental, payable quarterly, for all discharge to the Sewer System in excess of 12,000 gallons for any three month period, based on the quantity of water used (or on discharge to the Sewer System as hereinafter provided) at the rate of $3.50 per 1,000 gallons or any portion thereof of water used (or discharged to the Sewer System as hereinafter provided).

(b) Schools. Schools shall be charged additional sewer rental, based upon the quantity of water used by them (or on discharge to the Sewer System), at the rates and in the manner provided in Section 4a hereof; provided, however, that notwithstanding said Section 4a, the additional sewer rental charge for each school for each quarterly billing period ending September 30 shall not be less than an amount equal to the average of the additional sewer rental charges for the three billing periods next preceding the period ending September 30 in each year.

(c) Other Seasonal or Intermittent Use. Additional sewer rentals (for any quarterly billing period) imposed upon seasonal or other intermittent users of the Sewer System, other than schools, at the sole discretion of the Authority, may be based upon actual flow or upon average peak period flow; provided, however, that the Authority shall not impose additional sewer rentals on the basis of average peak period flow until it shall have received at least one full year's flow records with respect to the subject user.

(d) The Authority reserves the right to require any property not subject to payment of additional sewer rentals hereunder to pay such rentals, if, because of suspected infiltration or for any other reason, the governing body of the Authority believes that such property is discharging to the Sewer System flow in excess of 20,000 gallons per use per quarter. Such additional sewer rentals shall be imposed by resolution of the governing body of the Authority upon not less than ten (10) days prior written notice to the subject property owner. In such event, the Authority, at its own expense, may require the installation of water or sewage measuring devices as provided in Section 6

hereof.

(e) Nothing herein contained shall be deemed to require the governing body of the Authority to impose additional sewer rentals upon any property other than in accordance with subsections (a) and (b) of this Section 4.

Section 5. Measuring Volume for the Purpose of Section 4.

(a) Methods of Measuring Volume.

(1) Except as herein otherwise provided, whenever a Person purchasing all water used from the Water Company discharges Sanitary Sewage or Domestic Waste and/or Non-Domestic Waste into the Sewer System, the volume of water used, as determined from meter readings of the Water Company may be used in computing the sewer rentals.

(2) Except where water meter readings are not to be used in computing sewer rentals, where a Person has a source of water supply in addition to or other than from the Water Company and discharges Sanitary Sewage or Domestic Waste and/or Non-Domestic Waste into the Sewer System, such Person shall permit the Authority to install a meter on such additional or other source of supply. The total amount of water consumed as shown by these meter readings will be used in computing the sewer rentals.

(3) In cases where a Person uses water from the Water Company and/or from an independent supply such that all or any part of the water so used is not discharged into the Sewer System, the quantity of water used to determine the sewer rentals may be computed by one of the following methods as determined by the Sewer Manager: Method No. 1. By placing a meter or measuring device on the sewer connection. The readings from this meter or measuring device may be used in computing the sewer rentals. Method No. 2. By placing a meter or measuring device on the effluent not discharging into the Sewer System. The reading from this meter or measuring device will then be deducted from the total water meter readings and the remainder will be used in computing the sewer rentals. Method No. 3. When it is not practical to install measuring devices to determine continuously the quantity of water not discharged into the Sewer System, the Sewer Manager will determine, in such manner and by such method as he may prescribe, the percentage of metered water discharged into the Sewer System and the quantity of water used to compute the sewer rentals shall be the percentage so determined of the quantity measured by the water meter or meters. Any dispute as to the estimated amount shall be submitted to the Board of the Authority after notice of the estimate, whose decision on the matter shall be final.

(4) With respect to any property connected to the Sewer System, the Authority, at its sole discretion, may determine that, because of suspected infiltration or for any other reason, water meter readings are not an appropriate measure of sewer system usage. In such event, the Authority, at its own expense, shall cause a meter or metering device to be placed on the sewer connection. The readings from

this meter or measuring device shall be used in computing the additional sewer rentals.

(b) Measuring Devices. All meters or measuring devices required to be used under the provisions of this Ordinance (except those provided by the Water Company or those provided by the Authority under Section (a)(2) above) shall be furnished and installed by the Authority at the expense of the property owner. All such meters or measuring devices (except those provided by the Water Company) shall be under the control of the Authority and may be tested, inspected or repaired by Authority employees or agents whenever the Sewer Manager shall deem necessary. The owner of the property upon which such measuring device is installed shall be responsible for its maintenance and safekeeping, and all repairs thereto shall be made by the Authority at the property owner's expense, whether such repairs are made necessary by ordinary wear and tear or other causes. Bills for such installation and repairs shall be due and payable at the same time and collected in the same manner as are the bills for sewer services; such bills from and after their due date shall constitute a lien upon the property upon which such measuring device is installed.

(c) Meter Readings. The Authority shall be responsible for the reading of all meters or measuring devices (except to the extent the Water Company's readings are used), and they shall be made available to Authority employees or agents for meter reading at any reasonable time.

Section 6. Changes in Classification, Additional Classifications and Modifications. If use or classification of any property should change within any quarterly period the difference in the sewer rental, pro-rated on a monthly basis to the nearest calendar month, will be charged or credited, as the case may be, on the bill for the succeeding quarterly period. Additional classifications and additional sewer rentals may be established by the Authority from time to time.

Section 7. Time and Methods of Payments. Sewer rentals or charges shall be billed quarterly as of the last business day of the calendar quarter and shall be due and payable on their respective dates. The bills for properties connecting during a billing period will be prorated on the basis of the applicable rate. The bills for the first billed period after this Ordinance is enacted shall be prorated.

Section 8. Penalties for Delinquent Sewer Rentals and Liens. Quarterly charges for sewer service shall be subject to ten percent (10%) penalty if not paid within thirty (30) days after they are due. If not paid within sixty (60) days after becoming due, the bill plus the penalty shall bear interest from the due date at the rate of one percent per month or fraction thereof until paid and the Authority shall have the right to cut off sewer service from such premises and not to restore the same until all bills against the same and the cost of cutting off and restoring service shall have been paid.

All persons connected to the Sewer System must give the Authority their correct address. Failure to receive bills will not be considered an excuse for non-payment nor permit an extension of the period during which bills are payable at face.

All sewer rentals, together with all penalties thereon, not paid on or before the end of one year from the date of each bill shall be deemed to be delinquent. All delinquent sewer rentals and all penalties thereon shall be a lien against such property in the office of the Prothonotary of Chester County and shall be collected in the manner provided by law for the filing and collection of such liens.

Section 9. Segregation of Sewer Revenues.

(a) The funds received by the Authority from the collection of sewer rentals and charges and all penalties thereon, as herein provided for, and any fines collected or received by the Authority in connection with the Sewer System shall be segregated, earmarked and deposited in a separate fund, to be designated "Sewer Revenue Account".

(b) The funds received by the Authority from payment of connection charges, inspection charges and tapping fees and all penalties thereon, imposed by the Authority and collected by the Authority or the Township or the Borough as its agent, shall be deposited in the above-mentioned Sewer Revenue Account.

(c) Said funds shall be used only for the purpose specified in any agreement it may enter into for and of, or in connection with, said Sewer System, with any trustee, in accordance with the provisions of the Act of May 2, 1945, P.L. 382, as amended and supplemented.

Section 10. Non-Domestic Waste Discharge Permits

(a) Non-Domestic Waste Discharge Questionnaire

All persons who discharge or propose to discharge Non-Domestic Waste to the Sewer System shall be required to complete and file with the Authority, a Non-Domestic Waste Discharge Questionnaire as prescribed and furnished by the Authority, which shall include pertinent data inclusive of flow and analysis of all wastes discharged to the Sewer System. Failure to comply with this requirement shall be cause for termination or disapproval of service in accordance with the provisions of this Resolution.

(b) Non-Domestic Waste Discharge Permits

(1) Permits - Discharge of any wastes by any User to the Sewer System containing quantities or concentrations of pollutants in excess of those listed in Section 12 shall require a Non-Domestic Waste Discharge Permit. Additionally, a Non-Domestic Waste Discharge Permit shall be required by the Authority of any User to the Sewer System which may have the potential to dishcarge toxic substances or in any other way result in a discharge of waste prohibited in Section 12.

(2) Permit Application - Users required to obtain a Non-Domestic Waste Discharge Permit shall complete and file with the Authority an application as prescribed and furnished by the Authority. Existing Users shall apply for a permit within 30 days of notification by the Authority, and proposed Users, not discharging or having the potential to discharge to the Sewer System as of the effective date of

these Regulations shall be required to apply for a permit 60 days prior to connecting or commencing discharge. All proposed Users required to file applications for a permit shall be required to complete a Non-Domestic Waste Discharge Questionnaire as outlined in Subsection 10(a). The Authority reserves the right to require any information which, in the opinion of the Authority, is necessary to adequately characterize and evaluate the discharge of the User.

The Authority must be notified of any new activity of any existing User if that activity will result or have the potential to result in a discharge requiring a permit as specified in this Section. Such notification must take place at least 30 days prior to commencement of the activity or its resulting discharge.

(3) Permit Conditions - Non-Domestic Waste Discharge Permit conditions shall be written in accordance with the applicable procedures or methods developed by the Authority. The permit conditions may include specific discharge limitations, requirements for record keeping, metering, sampling, reporting by the User and other conditions necessary to control wastes discharged to the Sewer System including the following:

(a) Limits, based on mass and/or concentration on the average and maximum wastewater constituents and characteristics;

(b) Limits on average and maximum rate and time of discharge or requirements for flow regulation and equalization;

(c) Requirements for installation and maintenance of inspection and sampling facilities;

(d) Specifications for monitoring programs which may include sampling locations, frequency of sampling number, types and standards for tests and reporting schedules;

(e) Compliance schedules;

(f) Requirements for submission of technical reports or discharge reports;

(g) Requirements for maintaining and retaining plant records relating to the waste discharge as specified by the Authority and affording Authority access thereto;

(h) Requirements for notification of the Authority by the User of any new introduction of waste constituents or any substantial change in the volume or character of the waste constituents being introduced into the Sewer System;

(i) Requirements for notification of slug discharges;

(j) Permit renewal requirements and procedures;

(k) Other conditions.

(4) Permit Duration - Non-Domestic Waste Discharge Permits will be for a specific duration as specified in the permit and in accordance with the reporting and renewal provisions listed therein.

(5) Permit Transfer - Non-Domestic Waste Discharge Permits are issued to a specific User for a specific operation on specific premises. A Non-domestic Waste Discharge Permit shall not be reassigned or transferred.

(c) Permit Compliance Reporting

(1) Compliance Data Reporting - Within 90 days following commencement of the introduction of waste into the Sewer System, any Non-Domestic User shall submit to the Authority a report indicating the nature and concentration of all pollutants and toxic substances in the discharge from the regulated activity. The report shall state whether the applicable standards or requirements are being met on a consistent basis and, if not, what additional operation and maintenance and/or pretreatment is necessary to bring the User into compliance with the applicable standards or requirements. This statement shall be signed by an authorized representative of the User.

(2) Periodic Compliance Reports - Any existing User subject to a National Categorical Pretreatment Standard as established by the U.S. Environmental Protection Agency, after the compliance date of such Pretreatment Standard, or, in the case of a new source, after commencement of the discharge into the Sewer System, shall submit to the Authority, as specified in the User's Non-Domestic Waste Discharge Permit, a report indicating the nature and concentration of pollutants in the waste. In addition, this report shall include a record of daily flows and loadings as required. At the discretion of the Authority and in consideration of such factors as local high or low flow rates, holidays, budget cycles, etc., the Authority may agree to alter the periods during which the above reports are to be submitted.

Reports required by a Non-Domestic Waste Discharge Permit shall contain the results of sampling and analysis of the User's discharge including the flow and the nature and concentration, and production and mass where requested by the Authority, of pollutants contained therein which are limited by the applicable standards. The frequency of monitoring shall be as prescribed in the User's Non-Domestic Waste Discharge Permit. All analyses shall be performed in accordance with procedures established by the EPA pursuant to Section 304(g) of the Clean Water Act and contained in 40 CFR, Part 136 and amendments thereto, Standard Methods, or any other test procedures approved by the Authority.

(d) Monitoring Facilities

The Authority may require to be provided and operated at the User's own expense, monitoring facilities to allow inspection, sampling, and flow measurement of the total discharge of the User to the Sewer System. The

monitoring facility shall be situated on the User's premises.

There shall be ample room in or near such sampling manhole or facility to allow accurate sampling and preparation of samples for analysis. The facility, sampling, and measuring equipment shall be maintained at all times in a safe and proper operating condition at the expense of the User.

The sampling and monitoring facilities shall be provided in accordance with the Authority's requirements and all applicable local construction standards and specifications. Construction shall be completed within the time specified by written notification by the Authority.

(e) Inspection and Sampling

The Authority shall have the right to inspect the facilities of any User to ascertain whether the purposes of these Rules and Regulations are being met and all requirements are being complied with. Persons or occupants of premises where waste is created or discharged shall allow the Authority or its agent or representative ready access at all reasonable times to all parts of the premises for the purposes of inspection, sampling, records examination or in the performance of any of their duties. The Authority shall have the right to set up on the User's property such devices as are necessary to conduct sampling inspection, compliance monitoring and/or metering operations. Where a User has security measures which would require proper identification and clearance before entry into their premises, the User shall make necessary arrangements with its security guards so that upon presentation of suitable identification, the Authority, its agents or representatives, will be permitted to enter, without delay, for the purposes of performing their specific responsibilities.

(f) Pretreatment

Users shall provide necessary waste treatment as required to comply with these Rules and Regulations. Any facilities required to pretreat waste to a level acceptable to the Authority shall be provided, operated and maintained at the User's expense. Detailed plans showing the pretreatment facilities and operations procedures shall be submitted to the Authority for review, and shall be approved by the Authority before construction of the facility. The review of such plans and operating procedures will in no way relieve the User from the responsibility of modifying the facility as necessary to produce an effluent acceptable to the Authority under the provisions of these Rules and Regulations. Any subsequent changes in the pretreatment facilities or method of operation shall be reported to and be acceptable to the Authority prior to the User's initiation of the changes.

All records relating to compliance shall be made available to the Authority upon request.

(g) Confidential Information

Information and data on a User obtained from reports, questionnaires, permit applications, permits and monitoring programs and from inspections shall be available to the public or other governmental agency

without restriction unless the User specifically requests and is able to demonstrate to the satisfaction of the Authority that the release of such information would divulge information, processes or methods of production entitled to protection as trade secrets of the User.

Section 11. Prohibited Wastes.

(a) No Person shall discharge or cause to be discharged any storm water, surface water, ground water, roof runoff or subsurface drainage into the Sewer System.

(b) No Person shall discharge or cause to be discharged any of the following into the Sewer System:

(1) Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, fur, plastics, wood, paunch manure, butchers offal, hair or any other solids or viscous substance capable of causing obstruction to the flow in sewers or the interference with the proper operation of the Sewer System.

(2) Any inert insoluble solids such as, but not limited to: asphalt, clay, slag and mill scale, or sludges and slurries.

(3) Any waters or waste containing any quantities or formaldehyde, carbide waste, or phenols.

(4) Any waters or waste containing radioactive isotopes.

(5) Any noxious, toxic, or malodorous substances not mentioned in the foregoing list that will pass through the Sewage Treatment Works and exceed the state and interstate requirements for the receiving stream.

Section 12. Discharge of Waste. Except as otherwise provided in these Rules and Regulations, no Person shall discharge or cause to be discharged any of the following described substances, materials or waste into the Sewer System:

(a) Any cooling water, unpolluted industrial or commercial process water.

(b) Any vapor or steam.

(c) Any liquid having a temperature higher than one hundred forty (140) degrees Fahrenheit.

(d) Any fluid waste containing in excess of one hundred (100) parts per million of fat, oil, wax, grease, either vegetable or mineral, or containing substances which may solidify between thirty-two (32) and one hundred (100) degrees Fahrenheit.

(e) Any liquids, solids or gases such as benzene, gasoline, naphtha, fuel oil or other volatile, explosive or flammable substance which, by reason of its nature or quality, may cause fire or explosion or be in any

way injurious to persons, to the Sewer System or the operation thereof.

(f) Any unshredded garbage. The installation and operation of any garbage grinder equipped with a motor of greater than (1/2) horsepower shall be subject to review and approval by the Authority.

(g) Any waste containing a 5-day BOD in excess of 250 ppm.

(h) Any waste containing a total suspended solids content in excess of 300 ppm.

(i) Any waste having a chlorine demand in excess of 10 ppm.

(j) Any fluid having a pH lower than six (6.0) and higher than nine (9.0).

(k) Any water waste containing any substances which are not amenable to treatment or reduction by the biochemical wastewater treatment processes employed or are amenable to the treatment only to such a degree that the effluent of the Sewage Treatment Works cannot meet the requirements of agencies having jurisdiction over the discharge to the receiving stream.

(l) Any toxic substance not mentioned in the foregoing list that will pass through the treatment works and exceed the maximum permitted levels for such substance under the requirements of State or other governmental agencies.

(m) Any substance prohibited by any permit issued by the Commonwealth of Pennsylvania or the Environmental Protection Agency.

(n) Any waste containing toxic or poisonous substance in excess of the following limits, measured at the point of discharge into the Sewer System:

	ITEM	PPM
1.	Acetone	0.1
2.	Aluminum	0.3
3.	Antimony	0.4
4.	Arsenic	0.05
5.	Barium	0.1
6.	Benzene	0.02
7.	Beryllium	Not Detectable*
8.	Bis-Chloromethyl Ether	Not Detectable*
9.	2- Butanone	0.2
10.	Butylbenzyl Phthalte	0.01
11.	Boron	0.5
12.	Bromide	Not Detectable*
13.	Cadmium	0.002
14.	Carbon Tetrachloride	0.005
15.	Chloride	250.0
16.	Chlorobenzene	0.05
17.	Chloroethane	0.05
18.	Chloromethane	0.005

19.	2- Chloronapthalene	0.01
20.	Chromium (Total)	0.1
21.	Cobalt	0.05
22.	Copper	0.02
23.	Cyanide	0.01
24.	DDT	Not Detectable*
25.	Dibromomethane	0.01
26.	1,3 Dichlorobenzene	0.05
27.	1,1 Dichloroethane	0.09
28.	1,2 Dichloroethane	0.01
29.	1,2 Dichloroethylene	0.01
30.	1,2 Dichloropropane	0.01
31.	Diethyl Phthalate	0.03
32.	Dimethyl Phthalate	0.01
33.	Ethyl Benzene	0.01
34.	Fluoride	1.0
35.	2- Hexanone	0.01
36.	Hydrogen Sulfide	Not Detectable*
37.	Iodide	Not Detectable*
38.	Iron	3.0
39.	Isophorone	0.05
40.	Lead	0.005
41.	Lindane	0.0002
42.	Manganese	0.5
43.	Mercury	0.05
44.	Methylene Chloride	0.1
45.	Methyl-2 Pentanone	0.02
46.	Nickel	0.2
47.	Nitrates	5.0
48.	Nitrites	3.0
49.	Nitrogen (as NH3)	17.0
50.	Organic Surfactants	1.0
51.	Ozone	Not Detectable*
52.	PCB (All Aroclors)	0.001
53.	Phenol	0.05
54.	1- Propanol	0.6
55.	2- Propanol	0.5
56.	Residual Chlorine	0.2
57.	Selenium	0.01
58.	Silver	0.0005
59.	Sodium	10.0
60.	Tetrachloroethylene	0.02
61.	Tetrahydrofuran	0.03
62.	Thallium	0.03
63.	Tin	0.8
64.	Toluene	0.05
65.	1,2 Trans Dichloroethylene	0.03
66.	1,1,1 Trichloroethane	0.1
67.	Trichloroethylene	0.8
68.	1,2,3 Trichloropropane	Not Detectable*
69.	Xylene	0.01
70.	Zinc	0.2

* - Parameter shall not be detectable using the most sensitive analytical method

Provided, however, that deviations from the above schedule may be authorized by the Authority in its sole discretion, upon an affirmative showing by the Person requesting the same that such deviation will not be harmful to the Sewer System and upon approval by the Authority's Consulting Engineer.

Section 13. Service Regulations. The following regulations shall apply:

(a) A garbage disposal unit with a motor of one-half (1/2) horsepower or less may be installed in any single family dwelling or unit without a permit.

(b) Air conditioning units using 20 gallons of water per minute or less and having a discharge temperature of not over one hundred forty (140) degrees F. may discharge into the Sewer System.

(c) Floor drains used for washing and cleaning will be permitted only on application to the Authority and only after provisions have been made for the removal of sand, grit, oil, grease, garbage or any other materials.

Section 14. Enforcement. In the event that the owner or operator of any Industrial, or Commercial and Institutional Establishment fails to conform or comply with the terms and conditions of its agreement with the Authority as applicable, pertaining to the discharge of its wastes which failure causes damage to the Sewer System or to any employee thereof, the owner or operator shall be liable for such damage; or, in the event of the discharge of any substance that kills fish or causes other environmental damage, the owner or operator shall be liable for the damages thereof. The limit of the damage shall be determined by the Authority where its facilities are involved and the owner or operator shall be billed therefor. Legal action may be taken to enforce collection, or the Authority may resort to the termination of its connection to the Sewer System.

Section 15. Surcharge Formula. Any Non-Domestic Waste of unusual strength or character accepted by the Authority shall be subject to a surcharge to be paid by the Industrial, or Commercial and Institutional Establishment concerned. The basic rate and the basic rate for the surcharge shall be the rate per thousand gallons as set forth in Sections 3 and 4 above, as follows:

(a) The surcharge is based on a waste having a 5-day 20-degree Centigrade BOD greater than 250 ppm and/or a total suspended solids greater than 300 ppm, and/or an ammonia nitrogen concentration greater than 17 ppm.

(b) In the case of waste containing heavy metals, either in suspension or solution or when in the opinion of the Authority the suspended solids do not represent the true characteristics of the solids loading, the Authority reserves the right to use total solids instead of suspended solids.

(c) Non-Domestic Waste Surcharge Factor

$$F = \frac{(Si-300)}{300} + \frac{(Bi-250)}{250} + \frac{(Ni-17)}{17}$$

F = Factor applied to basic treatment rate

Si = Non-Domestic Waste total solids concentration in parts per million

Bi = Non-Domestic Waste BOD concentration in parts per million

Ni = Non-Domestic Waste ammonia nitrogen concentration in parts per million

The surcharge factor (F) or any portions of the calculation thereof shall never be less than zero. If any of the arithematic procedures for either the total suspended solids, BOD, or ammonia nitrogen portion of the equation yield a negative number, that portion of the equation shall be replaced by zero.

The sewer rent calculated in accordance with Sections 3 and 4 shall be multiplied by the surcharge factor (F) and added to the basic bill to establish the billing for the period.

(d) In the case of waste containing substances or materials that only can be treated with extra care and costs and where the surcharge as stated above does not apply, the Authority may accept the waste after a study of the waste has been made and a formula for the discharge has been established.

(e) In order to ascertain the strength of every Non-Domestic Waste, the Authority shall complete appropriate analyses quarterly of every Non-Domestic Waste entering the Sewer System, the results of which shall be used to establish the surcharge for the quarter in which the sample was collected. The Authority reserves the right to, and may from time to time, adopt, revise, amend and readopt such Rules and Regulations as it deems necessary and proper for the use and operation of the Sewer System.

Section 16. Effective Date. The Rates and any Rules and Regulations hereunder shall become effective on the earliest date permitted by law, and shall be applicable to all properties as soon as they respectively become connected with and have the right to use the Sewer System. The Authority reserves the right to make such changes from time to time as in its opinion may be desirable or beneficial, and to amend this Resolution or to change the rates or charges in such manner and at such times as in its opinion may be advisable, or as may be required by any lease referred to herein.

Section 17. Construction and Severability. If any of the provisions, sections, sentences, clauses or parts of this Resolution or the application of any provision hereof shall be held invalid, such invalidity shall not affect or impair any of the remainder of this Resolution, it being the intention of the Authority that such remainder shall be and remain in full

force and effect.

Duly adopted by the Board of the Authority this 16 day of May, 1989.

NORTHWESTERN CHESTER COUNTY
MUNICIPAL AUTHORITY

Attest:

Jonathan L. Swope
Secretary

By Harold L. Umble
Chairman

RATE SCHEDULE EFFECTIVE DECEMBER 1, 1991

QUARTERLY CHARGE — ~~$65.00~~ 70.00 per E.D.U.
Meters minimum 1 E.D.U. (65.00) plus $3.50 per 1000 GAl.

HAULERS FEE
9/1/89 — $20.00 per load up to 2000 gallons
$10.00 per 1000 or part thereof over 2000 gallons
plus $10.00 surcharge over maximum monthly loads -- per load.

PRIVILEGE FEE — ~~$1155.00~~ 1315.00 for each E.D.U.

TAPPING FEES
(Permit fee) — $300.00 plus 25.00 inspection for existing lateral or 50.00 for new laterals.

SINGLE FAMILY OR 1 E.D.U. — ~~1155.00~~ 1315.00 Privilege fee
$300.00 Tapping fee deposit, plus additional costs.
$25.00 or $50.00 per inspection.

ADDING APARTMENT OR E.D.U. TO EXISTING CONNECTION- — ~~1155.~~ Privilege fee
$25.00 inspection fee

CONNECTION WITH MORE THAN 1 E.D.U.- ~~$1155.~~ 1315 Privilege Fee
$300.00 Tapping fee
Inspection fee- $25.00 or $50.00

EXISTING LATERAL NEVER CONNECTED-
~~$1155.00~~ 1315 Privilege Fee
$300.00 Tapping fee
$25.00 Inspection fee

STORES & COMMERCIAL — ~~$1155.00~~ 1315 Privilege fee for each E.D.U.
$300.00 Tapping fee deposit, plus additional costs.
$25.00 or $50.00 Inspection fee

METER CUSTOMERS — ~~$1155.00~~ 1315 Privilege Fee
$300.00 Tapping fee when lateral installed (deposit) plus any additional costs.
$25.00 or $50.00 Inspection fee

Anticipated E.D.U.'s reviewed after 1 year and adjusted accordingly.

$25.00 Inspection fees to existing laterals includes testing equipment gauge, test balls and air.

$50.00 Inspection fee to New laterals and service connection includes testing equipment, gauge, test ball and air.
Permit from Township, Borough or State as required.

Laterals must have detector tape on them. Charge is .03 a foot.
(less than 6 feet deep)

AR301891

SCHEDULE OF QUARTERLY SEWER RATES

CUSTOMER CLASSIFICATION	EQUIVALENT DWELLING UNITS
A. Private Dwelling or Living Units	
1. Each Single Family dwelling unit	1.0
2. Each apartment unit	1.0
3. Mobile Home parks/courts, each space	1.0
B. Public Buildings	
Each Municipal building, church, fire house, post office	1.0
Day School - each student, teacher, employee	0.1
C. Commercial	
1. Motel or hotel units - per unit or room	0.4
2. Restaurant, bar room, other commercial establishments not otherwise classified -	
per employee	0.1
per each customer seat	0.1
minimum EDU if not on meter	1.0
3. Grocery stores - per employee	0.1
minimum	1.0
4. Drug Stores or pharmacies-	
per employee	0.1
minimum	1.0
5. Retail stores - per employee	0.1
minimum	1.0
6. Service Stations w/o washing facilities	1.0
7. Barbershops and Beauty salons per operator's chair	1.0
8. Financial institutions - banks, etc.	
per employee	0.1
minimum	1.0
9. Funeral homes	1.0
D. Industrial establishments - per employee	0.1
minimum	1.0
Additional for industrial wastes as outlined in E.	

E. Metered rates:

Laundromats, car washes, service stations with car washing facilities, bowling alleys, nursing homes, country clubs, photofinishers, theatres, Hospitals, swim clubs, dry cleaners, bakeries, and all other industrial wastewater contributors.

From 0 to 12,000 Gallons per quarter (minimum) $70.00
All gallons per quarter over 12,000 charged at $3.50 per thousand gallons.