ATTACHMENT 5
Closure Plan

CLOSURE PLAN

Introduction

Background

This plan outlines the method of closure for the Solid Waste Facility and the Container Storage Facility located at SRMC's Marcus Hook, Pennsylvania refinery.

This plan is written to meet the regulatory requirements of the U.S. Environmental Protection Agency (U.S. EPA) pursuant to implementing control of hazardous waste treatment, storage, and disposal practices under the Resource Conservation and Recovery Act (RCRA) and the Pennsylvania Department of Environmental Resources (DER) regulations promulgated September 4, 1982.

Scope and Objectives

The RCRA regulations require that hazardous waste treatment, storage, and disposal facilities have written closure plans. These plans specify, for each facility, its expected closure date, the sequence and scheduling of steps to completely close the facility, the maximum hazardous waste material inventory and extent of the unclosed portion of the facility during its lifetime, and decontamination procedures. The intent of the plan is to define closure steps which ensure that the closure is done in a manner that avoids release of hazardous materials dangerous to human health and the environment. A number of specific technical requirements are defined for tanks, surface impound-

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ments, landfills, land treatment areas, incinerators, thermal treatment, and chemical/physical biological treatment, some or all of which may be found at any given facility.

No hazardous wastes are disposed of at this facility. All hazardous waste are disposed of off-site in an approved manner. This disposal may be by one or more of several methods. Since no hazardous waste will be left at this site, no post-closure plan is required.

This closure plan is divided into four sections:

- General Plan Elements
- Closure Plan for the solid waste facility.
- Supplemental Information necessary to keep the plan up to date.
- Closure Plan for the Container Storage Facility.

Cost estimates are included in Tables 3-7 and 4-2.

General Plan Elements

Plan Availability

This plan is available at the Solid Waste Facility and at other locations in the refinery as shown in Table 3-3.

TABLE 3-3

CLOSURE PLAN DISTRIBUTION LIST

		Responsible Person	
Copy No.	Location	Title	Name
1	Environmental Engineering	Manager, Environmental Engineering	Stephen C. Martini
2	Solid Waste Facility	Foreman	Donald G. Wall
3	Pennsylvania DER	(Norristown Office)	N/A
4	ERM, Inc.	Consulting Engineers	Phillip Buckingham

TABLE 3-3

CLOSURE PLAN DISTRIBUTION LIST

Copy No.	Location	Responsible Person	
		Title	Name
1	Refinery Office	Refinery Manager	Refinery Central File
2	Environmental Engineering	Manager, Environmental Engineering	Arthur J. Raymond
3	Marcus Hook	Oil Transfer and Shipping	Donald G. Wall
4	Pennsylvania DER	(Norristown Office)	N/A
5	ERM, Inc.	Consulting Engineers	Phillip Buckingham

Amendments to Plan

This closure plan will be amended whenever any change in operating practices or facility design affect the sequence of steps and/or scheduling outlined in the plan. For example, the start date for closure for the facility will be adjusted if any significant change occurred in the life expectancy of the facility. Amendments to this plan will also be submitted to the Pennsylvania DER for approval.

At a minimum, this plan will be reviewed and updated annually within thirty days of the anniversary of the original estimate of 26 July 1982. This plan will also be promptly amended whenever a design project is implemented to change this facility. Furthermore, SRMC will amend this plan whenever a change in operating procedures occurs which affects closure. This annual review mechanism along with the efforts of the individual responsible for designing and implementing operating changes should keep this plan current.

As an added safeguard, all revisions to this plan will be listed on a revision page located in Table 3-6 at the end of this plan.

Note that all plan revisions should be issued simultaneously to all holders of this plan on the distribution list. Revisions to this distribution list are the responsibility of the Environmental Engineering Department and should be recorded as revisions to this plan. In all cases, the Refinery Manager (or his designate) should approve any changes to this plan.

Plan Submission

The closure plan for the refinery is submitted to the DER with the Part B permit application for the facility.

Closure Plan for the Solid Waste Facility

Partial Closure

This plan identifies the procedures necessary to close completely or partially the facility at any point during its intended operating life and to close the facility completely at the end of its intended operating life. The estimated year of closure for the Solid Waste Facility and Container Storage Area is 2020. If a tank or area is to be taken out of hazardous waste service before the remainder of the facility is closed, the closure plan will be implemented for that item.

The Marcus Hook refinery is a major petroleum refining complex and should remain in operation indefinitely. Although not expected, if the need arises for "partial closure" or discontinuation of a specific operation, concepts contained in this closure plan will be implemented for those equipment items being closed.

Summary

It is believed that the proper removal of all waste residue from the Solid Waste Facility will effectively eliminate any need for further maintenance. Likewise, it is believed that the proper removal of all waste residue will eliminate any post-closure

release of hazardous waste, constituents, leachate, contaminated rainfall, or any other introductions to the environment of harmful materials.

Closure Activities

A list of necessary activities for closure is shown in Table 3-4.

Maximum Waste Inventory

As shown in Table 3-5, the maximum waste inventory is 16,179 barrels (679,518 gallons).

Minimization of Post-Closure Maintenance

The Solid Waste Facility is not a disposal facility and no post-closure plan is required. The steps discussed in this plan will completely and adequately close the facility (or portions thereof), thereby eliminating the need for post-closure maintenance.

Schedule

A schedule of the specific steps necessary to close the facility are shown in Table 3-4. The times in this table are relative to SRMC management's decision to close the facility.

Facility Equipment Decontamination

Equipment decontamination is accomplished by one of several methods. Inner surfaces of tanks will be cleaned with steam jets, water, or cleaning fluids as appropriate. Solids in tank

TABLE 3-4

ACTIVITIES FOR FACILITY CLOSURE
AND CLOSURE SCHEDULE

Step	Action	Approximate Time (Days)
1	Facility is notified by Sun management of need to implement closure plan.	T
2	Environmental Coordinator submits closure plan to EPA Regional Administrator (Region III) and DER (Norristown) by certified mail, return receipt requested.	T + 1
3	Administrator(s) notifies Environmental Coordinator of closure plan approval or required modifications.	T + 91
4	Environmental Coordinator retains an independent registered professional engineer to oversee closure plan implementation.	T + 91 to T + 180
5	Environmental Coordinator incorporates any required modifications into closure plan and begins implementation at T + 180.	T + 91 to T + 180
6	Process all remaining wastes until storage facilities are at minimum operating levels and no further filter press runs utilizing wastes are possible.	T + 200
7	Run system on water to flush residual materials.	T + 201
8	Pump any recoverable oil to slop oil system.	T + 202
9	Drain any residual water to DELCORA.	T + 203
10	Safe and isolate all equipment.	T + 210
11	Open all tanks/vessels for cleaning.	T + 215
12	Remove any residual materials from tanks/vessels for off-site disposal at approved facilities.	T + 235

TABLE 3-4 (continued)

Step	Action	Approximate Time (Days)
13	Outside transportation vendor is contacted for final waste shipment to permitted, off-site disposal facility.	T + 236
14	Vendor and Environmental Coordinator make final waste inspection and prepare manifest.	T + 240
15	Vendor removes manifested waste inventory from facility.	T + 245
16	Deactivate all utilities.	T + 250
17	Vendor delivers waste shipment to disposal facility.	T + 255
18	Environmental Coordinator receives signed manifest from disposal facility. (Note: if manifest is NOT received within 35 days of shipment via the initial transporter, or within seven days of the date of estimated arrival at the hazardous waste facility, whichever is less, the Environmental Coordinator will investigate the status of the shipment, then notify the DER of that status within 24 hours. If satisfactory resolution is not achieved, an "Exception Report" must be filed within 45 days of shipment via the initial transporter or 14 days of the date the waste was expected to arrive at the hazardous waste facility, whichever is less.)	T + 265
19	Environmental Coordinator and independent registered professional engineer certify that closure is complete according to the approved closure plan.	T + 275
20	Environmental Coordinator submits certification to Regional Administrator.	T + 280

TABLE 3-5

MAXIMUM HAZARDOUS WASTE INVENTORY
AT THE SRMC SOLID WASTE FACILITY

Item	Capacity (bbls)
Tank 1 - Receiving Tank	500
Tank 2 - Receiving Tank	500
Tank 3 - Receiving Tank	500
Tank 4 - Sludge Storage Tank	10,000
Tank 5 - Decant Tank	4,000
Tank 6 - Collection and Transfer Tank	50
Tank 51 - Mix Tank	135
Tank 52 - Contact Tank	278
Tank 56 - Filtrate Tank	135
Tank 57 - Equalizing Tank	60
Tanks 53A, B, C - Surge Tanks	21
	16,179

bottoms (if any) will be removed by placing these materials in 55-gallon drums for disposal in a permitted landfill. Loading will be by shovel for small amounts or by vacuum truck for large amounts. Pipelines and pumps are cleaned by pumping water or appropriate cleaning fluids and by "pigging" (pumping a scraper or "pig" through the line to flush out residual waste and clean the inside surface). Tools and equipment which becomes contaminated during closure will be cleaned using steam or fluids, and the residual liquids and/or solids will be disposed of in the same manner as the residuals from tank cleaning.

Soil Sampling

Composite samples of soils from the zero to two- and two- to four-foot depth intervals were collected and analyzed from seven locations within the secondary containment berm surrounding Tanks 4 and 5. Locations of the samples and results of total and EP Toxicity leachate analyses for cadmium, chromium, and lead are included in Appendix H. Results of these analyses will be used as background data to determine if the soils are contaminated at the time of closure.

Specific Closure Requirements

All applicable specific closure requirements have been thoroughly detailed in the preceding sections.

Supplemental Information

Distribution List

A current distribution list for this plan is included in Table 3-3. Changes in this list should be recorded as amendments to the plan.

Closure Plan Revision Records

Table 3-6 can be used to tabulate revisions to the closure plan.

Post-Closure

As noted on page 3-37, post-closure requirements are not applicable to this facility.

Financial Assurance

Closure Costs

A copy of the most recent closure cost estimate corresponding to the closure plan is included in Table 3-7. Details of these calculations are included in Appendix H.

TABLE 3-6

REVISIONS TO PLAN

Date of Issue of Revision(s)	Pages Revised	Pages Added	Reason(s) for Revision(s) Note: Use all the space needed to provide an adequate explanation	Individual Responsible for Revision(s)	Checked By

TABLE 3-7

CLOSURE COST ESTIMATE FOR
SOLID WASTE FACILITY
(Based on 1983 Dollars)

A.	Decontamination of Equipment (process all remaining stored wastes)	$103,000
B.	Cleaning Tanks and Equipment and Removal of Residual Materials	300,000
C.	Safe and Isolate all Equipment and Deactivate all Utilities	84,000
D.	Subtotal	$487,000
E.	Allowance for Contingency	63,000
	TOTAL ESTIMATED CLOSURE COST	$550,000

Container Storage Facility

Should it be decided to close the Container Storage Facility, the following procedures will be followed:

- Each and every container of waste will be removed from the facility and disposed of off-site.

- The base of the Container Storage Facility will be thoroughly washed down, with the washings drained to the collection sump where they will be removed for disposal.

The closure costs for the Container Storage Facility are presented in Table 4-2, the details of which are included in Appendix H.

Post-Closure

Post-closure requirements are not applicable to this facility.

TABLE 4-2

CLOSURE COST ESTIMATE FOR
CONTAINER STORAGE AREA
(Based on 1983 Dollars)

A.	Remove all Containers for Off-Site Disposal (1,500 containers)	$ 96,000
B.	Decontaminate Facility	10,000
C.	Subtotal	$106,000
D.	Allowance for Contingency	19,000
E.	Estimated Closure Cost	$125,000

APPENDIX H

CLOSURE COST ESTIMATE

CONTENTS

A. Solid Waste Facility

B. Container Storage Facility

A. Solid Waste Facility Closure Costs

The closure costs for the Solid Waste Facility were estimated based on the following assumptions:

1. Expected waste inventory at time of closure - 3,900 cubic yards.

2. The closed facility has zero salvage value.

It is anticipated that the following costs will be incurred in closing the Solid Waste Facility:

1. Filter Press System Decontamination - To include:

- Processing all remaining stored wastes until storage facilities are at minimum operating levels and no further filter press runs utilizing wastes are possible.

- Pumping of any recoverable oil to refinery slop oil system.

- Draining any residual water to refinery wastewater system and eventually to DELCORA.

It is estimated that the filter press decontamination will require a crew of two plant operators and 25 days to complete.

Estimated Cost (including)
labor, supervision, overhead,
supplies, and contractor profit) = 25 days at $4,100/day
= $103,000

2. Tank Cleaning - To include:

- Opening of all tanks and equipment.

- Removal of any residual waste for off-site disposal at approved facilities.

It is estimated that the tank cleaning will require a crew of 15 laborers and 50 days to complete.

Estimated Cost (including)
labor, supervision, overhead,
supplies, and contractor profit) = 50 days at $6,000/day
= $300,000

3. Make Safe and Isolate all Equipment and Deactivate all Utilities

It is estimated that this task will require a crew of 15 laborers and 14 days to complete.

Estimated Cost (including labor, supervision, overhead, supplies, and contractor profit)	= 14 days at $6,000/day = $184,000
Allowance for contingency	63,000
ESTIMATED TOTAL CLOSURE COST (1983 dollars)	$550,000

B. Container Storage Facility Closure Costs

The closure costs for the Container Storage Facility were estimated based on the following assumptions:

1. Expected waste inventory at time of closure - 1,500 drums.

2. The closed facility has zero salvage value.

It is anticipated that the following costs will be incurred in the closing of the Container Storage Facility:

1. Removal and Disposal of Remaining 1,500 Drums

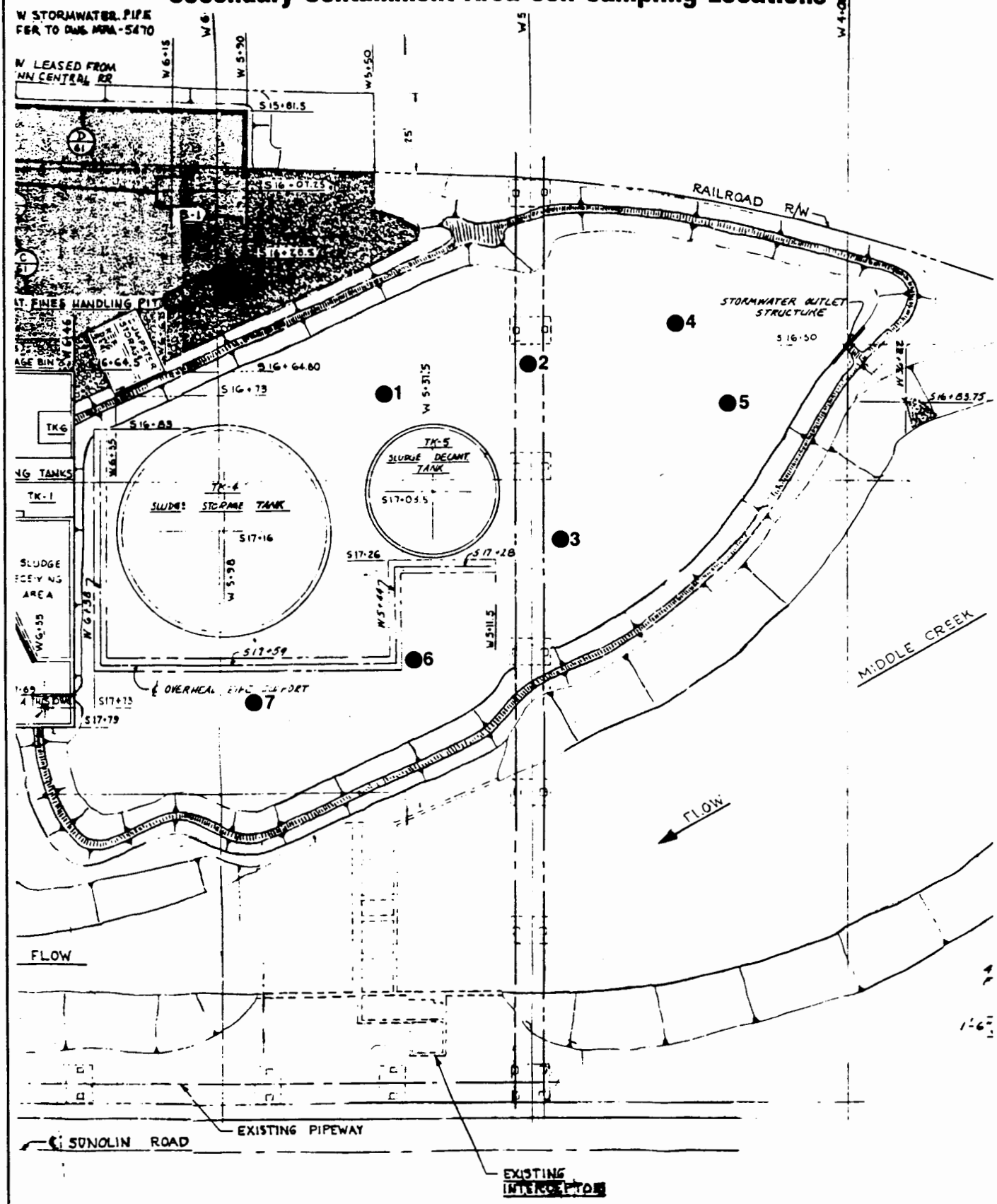
= $96,000

2. Decontamination of Facility

To include thorough water wash and disposal of washings. It is estimated that this task will require a crew of five laborers and five days to complete.

Estimated Cost (including labor, supervision, overhead, supplies, and contractor profit)	= 5 days at $2,000/day
	= $ 10,000
Allowance for contingency	19,000
ESTIMATED TOTAL CLOSURE COST	$125,000

Secondary Containment Area Soil Sampling Locations



Note: Composite Samples from 0'-2' and 2'-4' Were Collected at Each Sampling Location.

ERM

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Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380

Date Reported 6/18/86
Date Submitted 6/ 2/86
Discard Date 7/19/86
Collected by C
P.O. 19235
Rel.

1A (0-2') Composite Soil Sample
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	65.	ppm	2.	015101200
Lead	65.	ppm	2.	015501200

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

00767 20.00 005600

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Lee A. Seats, B.S. Group Ldr.
Inorganic Analysis

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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	53.	ppm	2.	015101200
Lead	38.	ppm	2.	015501200

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2A (0-2') Composite Soil Sample
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Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	1.1	ppm	0.5	014901200
Chromium	97.	ppm	2.	015101200
Lead	289.	ppm	2.	015501200

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2B (2-4') Composite Soil Sample
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Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	1.6	ppm	0.5	014901200
Chromium	73.	ppm	2.	015101200
Lead	988.	ppm	2.	015501200

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3A (0-2') Composite Soil Sample
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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	1.3	ppm	0.5	014901200
Chromium	373.	ppm	2.	015101200
Lead	452.	ppm	2.	015501200

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3B (2-4') Composite Soil Sample
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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	157.	ppm	2.	015101200
Lead	144.	ppm	2.	015501200

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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	1.0	ppm	0.5	014901200
Chromium	415.	ppm	2.	015101200
Lead	375.	ppm	2.	015501200

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4B (2-4') Composite Soil Sample
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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	86.	ppm	2.	015101200
Lead	208.	ppm	2.	015501200

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5A (0-2') Composite Soil Sample
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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	9.4	ppm	0.5	014901200
Chromium	1,120.	ppm	2.	015101200
Lead	1,010.	ppm	2.	015501200

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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	1.0	ppm	0.5	014901200
Chromium	336.	ppm	2.	015101200
Lead	402.	ppm	2.	015501200

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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.5	ppm	0.5	014901200
Chromium	98.	ppm	2.	015101200
Lead	227.	ppm	2.	015501200

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6B (2-4') Composite Soil Sample
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ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	80.	ppm	2.	015101200
Lead	189.	ppm	2.	015501200

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ANALYSIS REPORT

Lancaster Laboratories
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2425 NEW HOLLAND PIKE, LANCASTER, PA 17601
(717) 656-2301

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380

Date Reported 6/18/86
Date Submitted 6/ 2/86
Discard Date 7/19/86
Collected by C
P.O. 19235
Rel.

7A (0-2') Composite Soil Sample
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	145.	ppm	2.	015101200
Lead	140.	ppm	2.	015501200

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Reviewed and Approved by:

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Date Reported 6/18/86
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7B (2-4') Composite Soil Sample
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	ppm	0.5	014901200
Chromium	70.	ppm	2.	015101200
Lead	252.	ppm	2.	015501200

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EP Toxicity Leachate of 1A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 9.02 1 ml of 0.5 N Acetic Acid was used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 1B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	N.D.	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.34 1.8 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 2A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.008	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.01 1.4 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 2B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.012	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	0.28	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.16 0.9 ml of 0.5 N Acetic Acid was used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 3A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.006	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.29 1.8 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 3B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.006	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.26 1.6 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
The above analyses indicate that the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 4A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.009	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	0.13	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 7.79 1.4 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 4B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.006	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.17 1.6 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
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EP Toxicity Leachate of 5A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.022	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	0.08	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.39 4 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 5B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.012	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.50 3 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 6A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.014	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.08 4.3 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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EP Toxicity Leachate of 6B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.011	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.40 6.6 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Lee A. Seats, B.S. Group Ldr.
Inorganic Analysis

The American Association for Laboratory Accreditation
Chemical & Biological fields of testing

00767 9.00 014500

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ANALYSIS REPORT

Lancaster Laboratories
INCORPORATED
2425 NEW HOLLAND PIKE, LANCASTER, PA 17601
(717) 656-2301

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380

Date Reported 6/18/86
Date Submitted 6/ 2/86
Discard Date 7/19/86
Collected by C
P.O. 19235
Rel.

EP Toxicity Leachate of 7A (0-2') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.006	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.73 2 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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ANALYSIS REPORT

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West Chester, PA 19380

Date Reported 6/18/86
Date Submitted 6/ 2/86
Discard Date 7/19/86
Collected by C
P.O. 19235
Rel.

EP Toxicity Leachate of 7B (2-4') Composite Soil
Collected 05/27/86 by ML
Project #19235

ANALYSIS	RESULT AS RECEIVED		LIMIT OF DETECTION	LAB CODE
Cadmium	0.005	mg/l	0.005	024901200
Chromium	N.D.	mg/l	0.05	025101200
Lead	N.D.	mg/l	0.05	025501200

The above analyses were performed on an EP Toxicity leachate of the submitted waste prepared according to the procedure specified in Federal Register May 19 1980 p. 33127.
Leachate Preparation:
12. grams waste / 192 ml distilled water
Initial pH = 5.57 2.8 ml of 0.5 N Acetic Acid were used to maintain the pH at 5.0 Final volume was 240 ml.
The characteristic of EP Toxicity is determined by whether any of the contaminant concentrations (mg/l) in the leachate exceed the following maxima (100 X's Primary Drinking Water Standards): Arsenic 5.0; Barium 100.0; Cadmium 1.0; Chromium 5.0; Lead 5.0 ; Mercury 0.2; Selenium 1.0; Silver 5.0; Endrin 0.02; Lindane 0.4; Methoxychlor 10.0 Toxaphene 0.5; 2,4-D 10.0; 2,4,5-TP 1.0
Based on the analyses performed the submitted sample DOES NOT exhibit the characteristic of EP Toxicity as defined in Section 261.24 Federal Register 1980 p. 33122.

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