

30324994
R-07-8611-10
IA0133SIP
December 16, 1986

Site Inspection of the
Grimes Property Site
near
Keokuk, Iowa
TDD # R-07-8611-10
IA0133SIP
December 16, 1986

Submitted to Paul Doherty, ARPO
Prepared by Region VII E&E/FIT
Task Leader: Neal Hudson

30324994



Superfund

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SECTION 1: INTRODUCTION

The Ecology and Environment, Inc. Field Investigation Team (E&E/FIT) performed a Site Investigation of the Grimes Property near Keokuk, Iowa as directed by the Region VII U. S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) R-07-8605-03A. This property is located on the site of a former industrial landfill and solvent burning area. The site is now privately owned and used as the residence of the owner. The sole water source is from a well drilled through the filled area. Activities performed during the site investigation were intended to evaluate potential contamination of the surface or groundwater by the wastes disposed of at the site.

SECTION 2: BACKGROUND INFORMATION

2.1 SITE DESCRIPTION

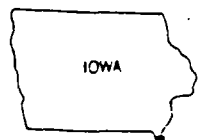
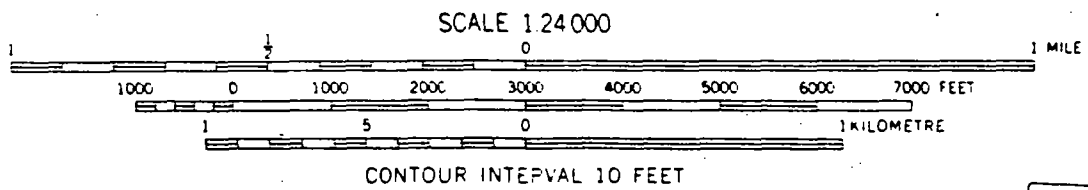
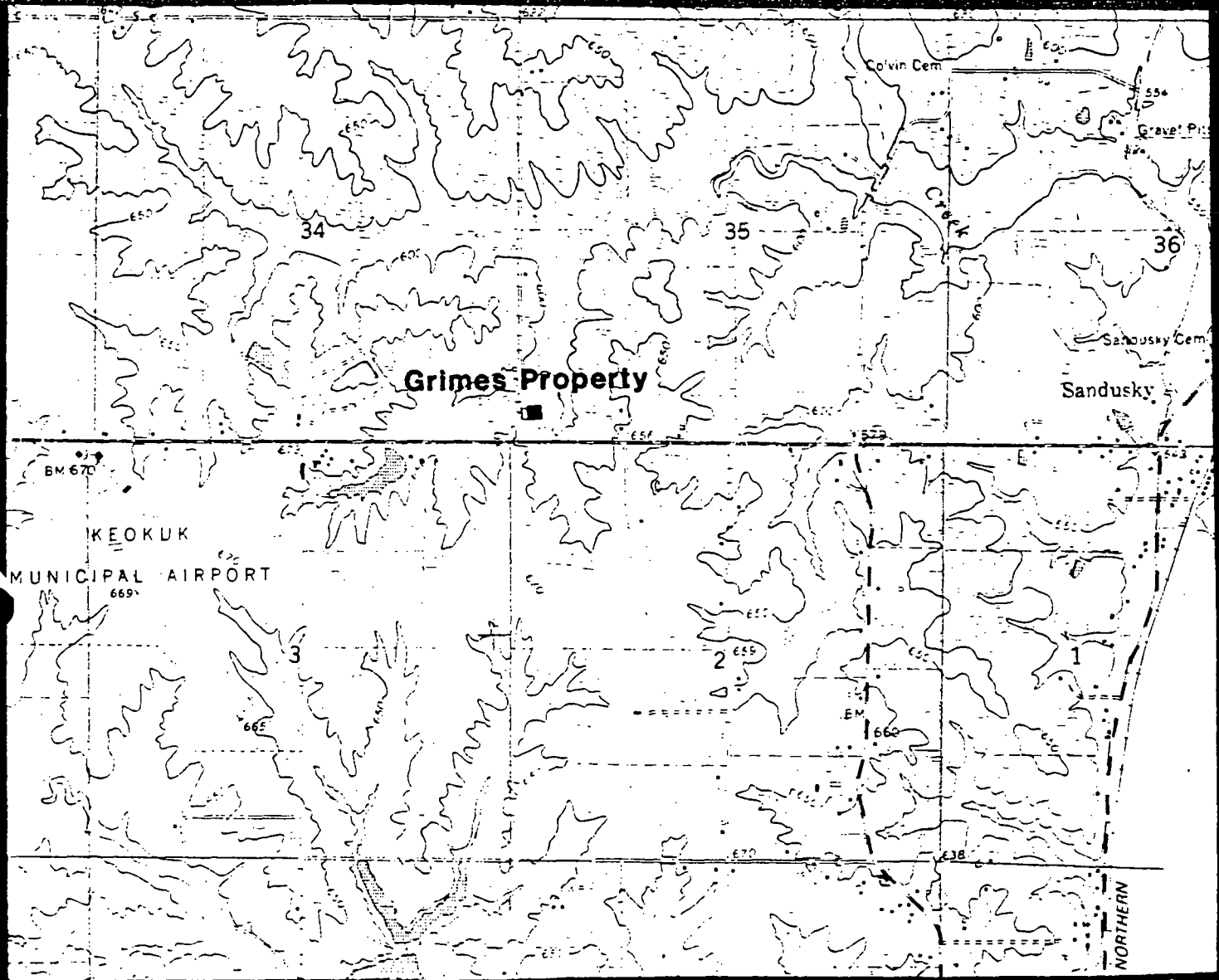
The Grimes property is located approximately four miles north of Keokuk, Iowa, off Airport Road about two miles east of Highway 218 (Fig. 2.1). The legal description of the site is SW 1/4, SW 1/4, SW 1/4 Section 35, T. 66 n. R. 5 W, Lee County, Iowa. The site occupies approximately five acres and was previously used by the Sheller Globe Corporation of Keokuk for open burning of solvents and disposal of industrial waste materials. The landfill was operated from 1947 to 1970. The industrial wastes may include rubber weather stripping, paint sludge, methylene chloride, methyl ethyl ketone, isopropyl and butyl alcohol, toluene diisocyanates, and resin containing freon. There are no records of quantities or types of wastes disposed of in the landfill (Ref. 1).

2.2 SITE HISTORY

The Grimes residence was built on the property in December of 1980. Domestic water is obtained via a 300' well located approximately 50' northeast of the house (Figure 4.1). Information regarding the driller and the well log is included in Appendix D.

Previous sampling of the Grimes' well was performed in October of 1980. Analytical results appear in Appendix E. Also shown are results from an upgradient and downgradient well. This information was made available to the Iowa Department of Environmental Quality by Sheller-Globe Corporation in January of 1981. No information was given as to who performed the sampling or to the depth and location of the upgradient and downgradient wells.

KEOKUK QUADRANGLE
IOWA-MISSOURI-ILLINOIS
7.5 MINUTE SERIES (TOPOGRAPHIC)



QUADRANGLE LOCATION

Fig. 2.1

SECTION 3: GEOLOGY/HYDROGEOLOGY

The Grimes property is located on the crest of a gently sloping hill. Surface water drainage is toward the northeast through unnamed intermittent streams into Lamalees Creek and ultimately into the Mississippi River (Fig. 2.1) approximately 2.5 miles downstream.

Unconsolidated deposits of the area are comprised of mixtures of glacial drift and alluvium. Two types of surficial aquifers are used for drinking water: the glacial drift aquifer and the buried channel aquifer. The immediate area was cut by a pre-glacial stream channel which is now buried under glacial and more recent alluvial deposits. Sediments in this buried channel aquifer consist of sands and gravel and may yield as much as 100 gallons of water per minute to local wells. Static water levels in these wells may be up to 175 feet deep. This buried stream channel overlays a shale aquiclude of Devonian Age (Ref. 3).

Residents also draw drinking water from the glacial drift aquifer which includes thick layers of soil with a heterogeneous nature with respect to grain size and mineralogy. Where it consists mainly of silt and clay, the aquifer does not yield much water, but locally there are lenses or beds of sand and gravel which are thick and widespread enough to serve as a dependable water source. Static water levels in the drift aquifer are commonly 10 to 50 feet below the land surface. This glacial drift aquifer is commonly underlain by limestone of Mississippian age (Ref. 3).

A well log from an on-site drinking water well showed that the primary unconsolidated deposits in the vicinity of the landfill consists of glacial till. This till extends to a depth of 117 feet and consists of alternating clay and sand layers. Underlying the till is a limestone member from the lower Augusta formation, Mississippian

in age. This limestone extends to 300 feet with alternating beds of shale and clay. The final depth of the well is 300 feet and is set on a shale probably Devonian in age. Although the Grimes well is located within the boundaries of the landfill the log for the well did not describe debris or fill materials expected.

The water table in the drift aquifer generally slopes from high land areas toward the streams and changes noticeably throughout the year. Levels in drift and buried-channel aquifers respond rapidly to recharge from precipitation. Due to the variety of sediments, there are probably many confined and perched water zones located in the unconsolidated materials (Ref. 3).

SECTION 4: SAMPLING ACTIVITIES

4.1 SURFACE WATER/SEDIMENT SAMPLES

A total of three stream sediment samples were collected from an intermittent stream located at the base and east of the landfilled area. Each sample was a composite of four aliquots, each representing the first six inches of depth. All sample locations are identified in Figure 4.1. Surface water samples consisted of three samples collected from the same locations as the stream sediment samples. Up-gradient conditions will be established by the upstream sediment and water sample. The midstream sediment/water sample was collected near a possible leachate seep into the stream as indicated by a rust discoloration of the stream sediment.

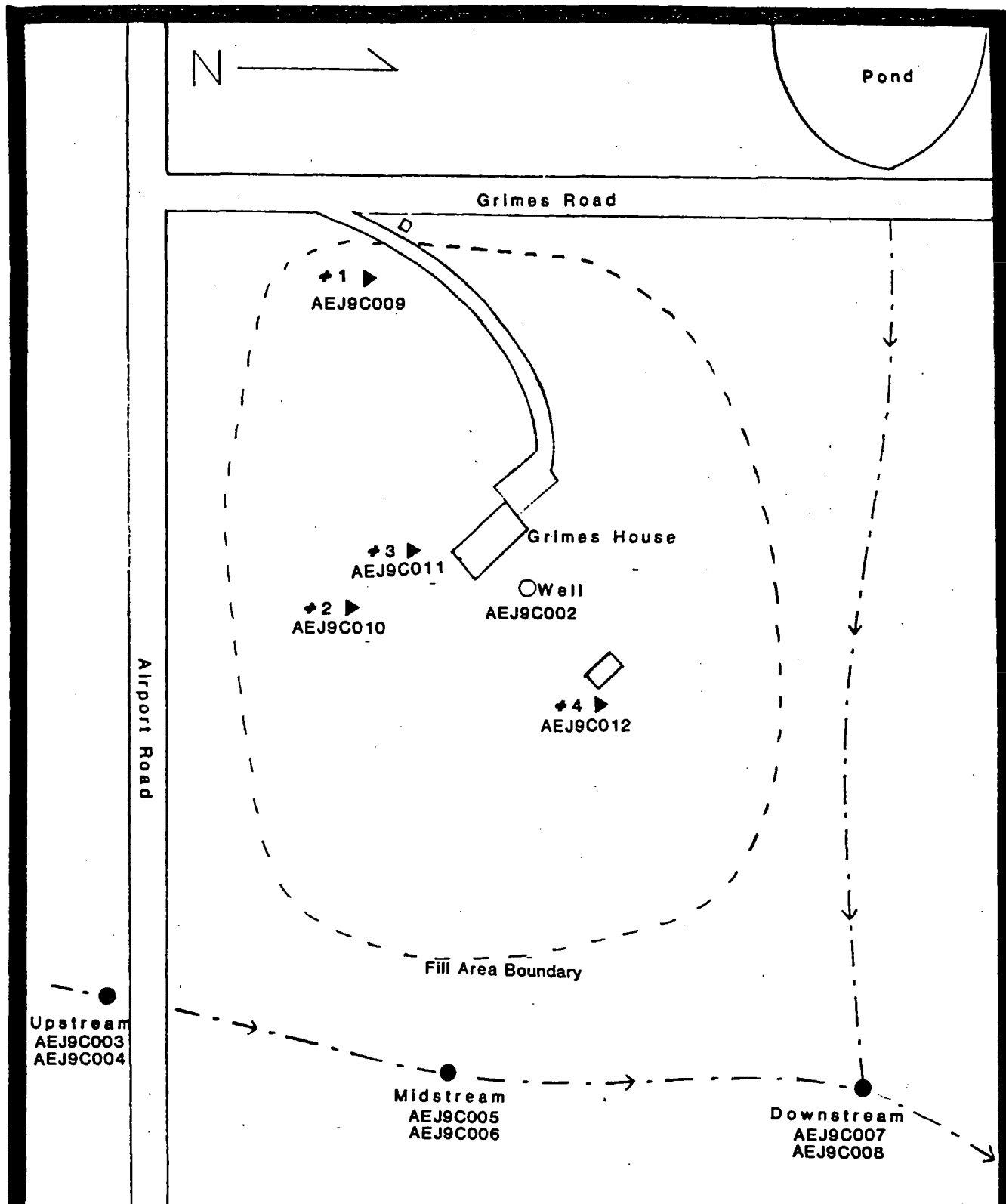
4.2 SURFACE SOIL SAMPLES

A total of four surface soil samples were collected on the Grimes property representing a depth of 0-12". Sample locations were selected by visual inspection of the site. Samples were prepared by homogenizing a single aliquot collected from 0-12" depth. One soil sample was duplicated for QA/QC.

4.3 GROUNDWATER SAMPLES

Three private wells were sampled: Grimes well, Keokuk Airport well, and Westermeyer well. Private well locations are shown in Figure 4.2.

The Grimes well is used for drinking and other household uses. A holding capacity of approximately 60-90 gallons made it necessary to let the water run for approximately 20 minutes before the sample was collected. Information regarding the drilling of this well is included in Appendix D. A duplicate sample of the Grimes well water was taken for QA/QC.



Not to scale

Sample Locations

● surface water
sediment sample

9/11/86
E&E/FIT

Fig. 4.1

▶ soil sample

KEOKUK QUADRANGLE
IOWA-MISSOURI-ILLINOIS
7.5 MINUTE SERIES (TOPOGRAPHIC)

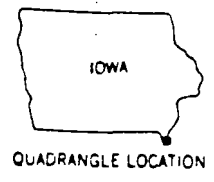
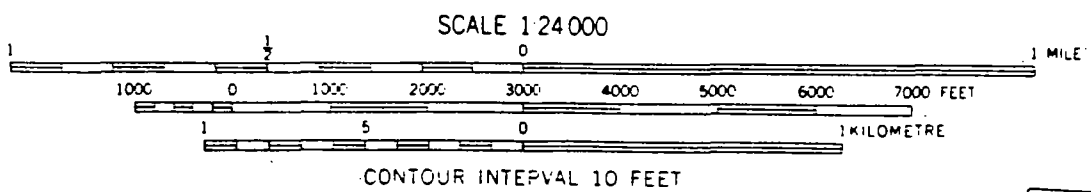
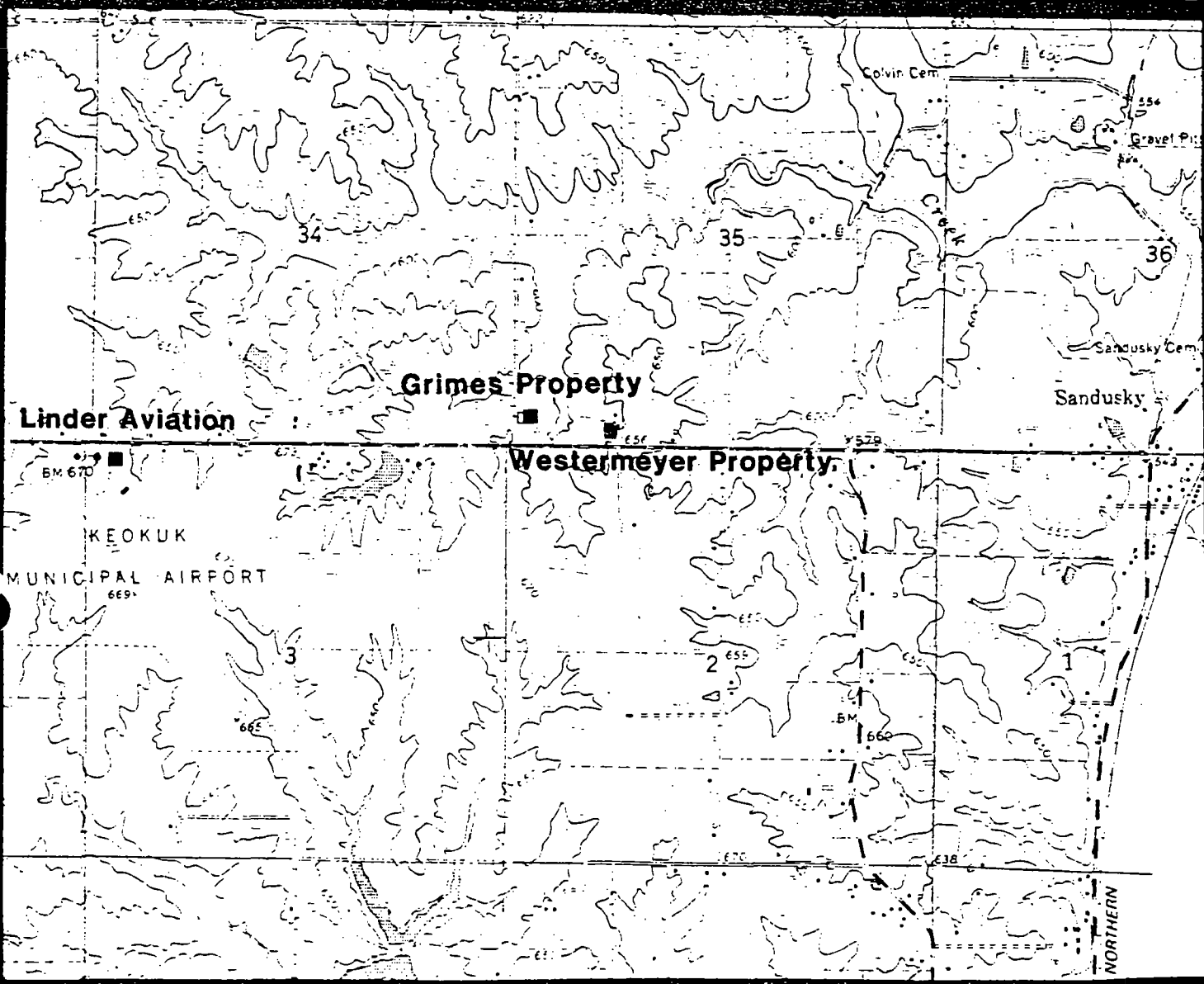


Fig. 4.2

The upgradient well was located at the Keokuk Municipal Airport. Since previous testing had shown the well to contain bacterial contamination, it is no longer used as drinking water. The sample was collected from a spigot directly on the well and the water was run for five minutes to purge the contents of the pipes. No information was available on the depth of the well. The well is presumed to be screened in the shallow subsurface due to the presence of the bacterial contamination.

The third well sampled was located on the property immediately east of the Grimes property on the opposite side of the valley. Water from the well is used for drinking and other household uses. The sample was collected from an outside spigot and the water was purged from the pipes prior to collection. The well was set at a depth of 49 feet. No drilling log was kept by the owners. Addresses of the property owners appear in Appendix F.

4.4 ANALYTICAL PARAMETERS

Each sample was collected for the following parameters:

- Acid fraction
- Base/neutral fraction
- Volatile organic fraction
- Total metal fraction

4.5 SAMPLE HANDLING

All water samples were preserved in the following manner:

<u>Parameter</u>	<u>Preservative</u>
B/N/A	Ice
Volatiles	Ice
Total Metals	HNO ₃ /Ice

All soil/sediment samples were preserved in the following manner:

<u>Parameter</u>	<u>Preservative</u>
B/N/A	None
Volatiles	Ice
Total Metals	None

Samples remained in the custody of the task leader until being transferred to Joyce Woods of the Region VII EPA laboratory on Thursday, August 28, 1986 at 1045 hours.

SECTION 5: DATA REVIEW

5.1 SURFACE WATER/SEDIMENT SAMPLES

Surface water and sediment samples were collected at three locations along the intermittent stream immediately east of the site.

5.1.1 Organics - Surface Water/Sediment

Only one compound was reported for one surface water sample. The value was twenty times less than the reported detection limit for the other samples.

Positive results for sediment samples are shown below:

<u>Sample Description</u>	<u>Sample #</u>	<u>2-Butanone</u>	<u>Toluene</u>	<u>Results in ug/kg</u> <u>4-Methylphenol</u>
Upstream sediment	AEJ9C004	-	-	-
Midstream sediment	AEJ9C006	2.10 M	-	-
Downstream sediment	AEJ9C008	14.0 M	1600	220 M

See Data Transmittal (Appendix B) for explanation of qualifier codes.

The only significant contaminant found was toluene in the downstream sample. This location does not clearly identify the Grimes Property as the likely source and could be explained by a small gasoline spill. (See sample location diagram, Fig. 4.1).

5.1.2 Metals - Surface Water/Sediment

No significant hazardous metals concentrations were found in any surface water or associated sediment samples. Manganese concentrations suggest a possible release; however, differentiation between upgradient and downgradient samples is insufficient to attribute the elevated downstream values to the site.

Selected results are tabulated below:

<u>Sample ID</u>	<u>Sample #</u>	<u>RA</u>	<u>Mn</u>	<u>Pb</u>	<u>An</u>
Upstream water	AEJ9C003	220	620	5.00	42.0 U
Midstream water	AEJ9C005	140 M	1900	5.00 M	51.0 U
Downstream water	AEJ9C007	220	4600	3.00	97.0 U
Upstream sediment	AEJ9C004	75.0	370 J	11.0	39.0
Midstream sediment	AEJ9C006	28.0M	170 J	9.40	37.0
Downstream sediment	AEJ9C008	100 M	390 J	24.0	550

5.2 Soil Samples

Surface soil samples representing the first 12 inches of depth were collected from four locations on site. Sample points were chosen from those areas exhibiting the greatest evidence of contamination (i.e. stressed vegetation, exposed rubber stripping).

5.2.1 Organics-Soil

Soil sample #3 contained low, but measurable levels of six volatile compounds (see table below). No other compounds were detected above contract laboratory program detection limits except for two phthalate compounds which appear as common contaminants.

Significant results are tabulated below:

<u>Contaminant</u>	<u>Soil #3 (AEJ9C011)</u>	<u>Soil #4 (AEJ9C012)</u>
Trichloroethene	70.0	6.4 U
Benzene	9.0	6.40 U
Toluene	93.0	6.40 U
Ethyl Benzene	59.0	6.40 U
Styrene	16.0	6.40 U
Total Xylenes	01.0	6.40 U
Bis(2 ethyl hexyl)phthalate	15,000 U	6,200
Di-N-Octol Phthalate	15,000 U	7,300

5.2.1 Metals-Soil

No significant concentrations of metals were found in any of the four on-site soil samples. Variation of measurable constituents was minimal.

5.3 GROUNDWATER SAMPLES

Three private wells were sampled including the Grimes well, Keokuk Airport and Westermeyer Property well (See Fig. 4.2).

5.3.1 Organics-Groundwater

Only one compound was reported as detectable in the three groundwater samples, that being 80.0 ug/L 2-Butanone in the Westermeyer well. However, due to a failure to meet all quality assurance criteria for the Contract Lab Program, the value was estimated ("J" qualified).

5.3.2 Metals-Groundwater

No significant differences were notable between the background, downgradient and Grimes wells. However, lead and zinc concentrations for the Grimes well are near drinking water maximums and deserve some consideration.

Notable metals results appear below:

<u>Sample ID</u>	<u>Sample #</u>	<u>Pb</u>	<u>Zn</u>
Upgradient well	AEJ9C014	3.00 M	120 U
Grimes well	AEJ9C002	55.0	3700
Grimes well (duplicate)	AEJ9C002D	25.0	2700
Westermeyer well	AEJ9C015	6.00	170 U

SECTION 6: CONCLUSIONS

Without an observed release to surface or groundwater this site does not earn a Hazard Ranking System(HRS) score of 28.5 required for an NPL candidate. Overall HRS scores were 46.38 with an observed release to groundwater and 28.23 without. A surface water release would raise the score slightly to 28.32. It should also be noted that the relatively high score with no release reflects a high estimate for waste quantity (>2500 cubic yards) which may not accurately depict conditions at this site. Data presented in this report does not change the draft HRS scores, therefore scores were not recalculated. An HRS worksheet is included as Appendix A.

High lead and zinc concentrations in the Grimes well cannot be attributed to the disposed wastes without additional well installation both immediately upgradient and downgradient of the site. Present contamination could be the result of plumbing connections associated with the Grimes well. Low metals concentrations in the apparent leachate seep sample (midstream water/sediment, AEJ9C005, AEJ9C006) support the theory of plumbing contamination.

Absence of any strong evidence of hazardous waste disposal on site and low contaminant concentrations in the apparent leachate seep sample suggest that no hazard is posed by the former landfilling operations. However, attention should be paid to the borderline drinking water levels of lead and zinc in the Grimes well, and the owner should be made aware of these results. Due to the fact that the Grimes well is located within the fill area, the possibility exists for seepage of contaminants along the well casing should seals or casing failure occur. Therefore, any change in water taste or color should be noted as a possible threat to suitability as drinking water.

References

- 1) Preliminary Assessment of Grimes Property, completed by Paul Landy of the Iowa Department of Water, Air, and Waste Management, August 11, 1983.
- 2) Keokuk, Iowa Quadrangle 7.5 Minute Topographic Map, United States Geological Survey, photo revised 1975.
- 3) Groundwater Resources of Lee County, Open File Report 80-56WRD, Iowa Geological Survey.

APPENDIX A
HRS Worksheet

APPENDIX B
Data Transmittal

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE

10/17/86

SUBJECT

Transmittal of Laboratory Data

FROM

Robert D. Kleopfer, Ph. D. ^{ROK}
 Chief, Laboratory Branch, ENSV

TO

Hensley

Analyses have been completed for the following activities and the data results are attached.

Activity No.	Description
AEJ 9C	Grimes Property
	(complete transmittal)

Attachments

cc: Data Files

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MD: 8 Day: 9th Time: 0900 Leader: Hudson

Sample Number: AEJ9C0602 SMD #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested

Sample Container	Tag Color	Preservative	Analysis Requested
1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
8Ooz. BOTTLE	PURPLE	ICE	A/E/N
VDA SET	PURPLE	ICE	VDA

LIME
NRH

Depth: 300' Pan #: _____ Aliquots: _____

Samplers: N. Hudson, E. Hubert
S. Martin

COMMENTS OF FIELD PERSONNEL

Site Description:

Grimes Well

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: Site Name: Grimes Property Site Number: 9C :
: Location: Keokuk Iowa Site Code: AEJ :

: Collected: YR: 86 MO: 09 Day: 26 Time: 0930 Leader: Hudson :
: : : : : : :
: : : : : : :
: Sample Number: AEJ9C004 SMD #: :
: : : : : : :
: Sample Media (circle one): : : :
: SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____ :
: : : : : : :
: Sample Split (circle one): YES NO : :
: : : : : : :

Sample Container	Tag Color	Preservative	Analysis Requested
8 oz. JAR	PURPLE		A/B/N
8 oz. JAR	WHITE		TOTAL METALS
VOA SET	PURPLE ^{NH₄} ICE		VOA
	Lime		

Depth: 0-6" Pan #: _____ Aliquots: 4
Samplers: Hudson/Habert

COMMENTS OF FIELD PERSONNEL

Site Description:
Upstream Sediment

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MD: 08 Day: 26 Time: 1000 Leader: Hudson

Sample Number: AEJ9C005 SMD #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER:

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested :

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/E/N
VOR SET	PURPLE	ICE	VOR
	LIME		
	NRA		

Depth: — Par #: — Aliquots: —

Samplers: Hudson/Habert

COMMENTS OF FIELD PERSONNEL

Site Description:
Mid Stream Water

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MO: 08 Day: 26 Time: 1030 Leader: Hudson

Sample Number: AEJ9C007 SMO #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested :

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/E/N
VOA SET	PURPLE	ICE	VOA
	LIME		
	YES		

Depth: _____ Par #: _____ Aliquots: _____

Samplers: Hudson/Hubert

COMMENTS OF FIELD PERSONNEL

Site Description:

Down stream water

FIELD SHEET
 U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
 ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property
 Location: Keokuk Iowa
 Site Number: 9C
 Site Code: AEJ

Collected: YR: 86 MD: 08 Day: 26 Time: 1100 Leader: Hudson
 Sample Number: AEJ9C009 SMD #:

Sample Media (circle one):
 SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER:

Sample Split (circle one): YES NO

Sample Container	Tag Color	Preservative	Analysis Requested
8 oz. JAR	PURPLE		A/E/N
8 oz. JAR	WHITE		TOTAL METALS
VDA SET	PURPLE	ICE	VDA
	LIME		
	NR		

Depth: 0-6" Par #: - Aliquots: 1
 Samplers: Martin

COMMENTS OF FIELD PERSONNEL

Site Description:
 Soil #1 - near SW corner of
 landfill

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MD: 08 Day: 26 Time: 1200 Leader: Hudson

Sample Number: AEJ9C012 SMO #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____

Sample Split (circle one): YES (NO)

Sample Container : Tag Color : Preservative : Analysis Requested

8 oz. JAR	PURPLE		A/B/N
8 oz. JAR	WHITE		TOTAL METALS
VOA SET	PURPLE	ICE	VOA
	LIME		
	NRA		

Depth: 0-2" Pan #: - Aliquots: 1

Samplers: Hubert

COMMENTS OF FIELD PERSONNEL

Site Description:

Soil #4

FIELD SHEET
U. S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MO: 08 Day: 26 Time: 1230 Leader: Hudson

Sample Number: AEJ9C0137 SMD #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested :

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/E/N
VDA SET	PURPLE	ICE	VDA
	LIME		
	URAN		

Depth: _____ Par #: _____ Aliquots: _____

Samplers: Hudson

COMMENTS OF FIELD PERSONNEL

Site Description:

Field Blank

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MO: 08 Day: 26 Time: 1315 Leader: Hudson

Sample Number: AEJ9C0/4 SMO #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER OTHER: _____

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/E/N
VOR SET	PURPLE	ICE	VOR
	LIME		
	MR		

Depth: _____ Pan #: _____ Aliquots: _____

Samplers: Hudson

COMMENTS OF FIELD PERSONNEL

Site Description:

upgradient well

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property Site Number: 9C
Location: Keokuk Iowa Site Code: AEJ

Collected: YR: 86 MD: 08 Day: 26 Time: 1430 Leader: Hudson

Sample Number: AEJ9C015 SMD #:

Sample Media (circle one):
SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER:

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/B/N
VOA SET	PURPLE	ICE	VOA
	LIME		
	NEW		

Depth: Par #: Aliquots:

Samplers: Hudson

COMMENTS OF FIELD PERSONNEL

Site Description:

Downgradient well

ANALYSIS TYPE: TOTAL METALS (CONTRACTOR)

TITLE: GRIMES PROPERTY

LAB: CHEMTECH

SAMPLE PREP:----- ANALYST/ENTRY: E29

MATRIX: WATER

METHOD: 9001M07

REVIEWER: *[Signature]*

UNITS: UG/L

CASE: 6370

DATE: 09/25/82

SAMPLE NUMBERS

COMPOUND	AEJ9C002		AEJ9C002D		AEJ9C003		AEJ9C005
ALUMINUM	200	U	200	U	2300.		200
ANTIMONY	60.0	U	60.0	U	60.0	U	60.0
ARSENIC	10.0	U	10.0	U	5.00	M	10.0
BARIUM	200	U	200	U	220		140
BERYLLIUM	5.00	U	5.00	U	5.00	U	5.00
CADMIUM	5.00	U	5.00	U	5.00	U	5.00
CALCIUM	34000.		34000.		92000.		180000
CHROMIUM	10.0	U	10.0	U	10.0	U	10.0
COBALT	50.0	U	50.0	U	50.0	U	50.0
COPPER	33.0		22.0	M	25.0	U	25.0
IRON	1100.		370		3300.		2700.
LEAD	55.0		25.0		5.00		5.00
MAGNESIUM	23000.		22000.		34000.		46000.
MANGANESE	15.0	U	15.0	U	620		1900.
MERCURY	0.2	U	0.2	U	0.2	U	0.2
NICKEL	40.0	U	40.0	U	40.0	U	40.0
POTASSIUM	2900.	M	2800.	M	3800.	M	5200.
SELENIUM	5.00	U	5.00	U	12.0	J	5.00
SILVER	8.00	M	7.00	M	10.0	U	10.0
SODIUM	200000.		200000.		32000.		96000.
STRONTIUM	10.0	U	10.0	U	10.0	U	10.0
TIN	N/A	I	N/A	I	N/A	I	N/A
VANADIUM	50.0	U	50.0	U	50.0	U	50.0
ZINC	3700.		2700.		42.0	U	51.0
CYANIDE	N/A	I	N/A	I	N/A	I	N/A

ANALYSIS TYPE: TOTAL METALS (CONTRACTOR)

CLIENT: GRIMES PROPERTY
 LAB: CHEMTECH
 SAMPLE PREP:----- ANALYST/ENTRY: E30

MATRIX: SEDIMENT
 METHOD: 9001M07
 REVIEWER: *[Signature]*
 UNITS: MG/KG
 CASE: 6370
 DATE: 09/25/86

SAMPLE NUMBERS

COMPOUND	AEJ9C004		AEJ9C006		AEJ9C008		AEJ9C009	
ALUMINUM	4600.		1900.		6600.		14000.	
ANTIMONY	39.0	U	36.0	U	46.0	U	38.0	
ARSENIC	5.20	J	2.40	M	9.20	J	16.0	
BARIUM	75.0	M	28.0	M	100	M	150	
BERYLLIUM	3.30	U	3.00	U	3.90	U	3.20	
CADMIUM	3.30	U	3.00	U	3.90	U	7.90	
CALCIUM	3200.	M	3200.		6400.		150000.	
CHROMIUM	9.60	J	5.80	J	13.0	J	35.0	
COBALT	6.50	M	30.0	U	6.50	M	5.10	
COPPER	7.00	M	15.0	U	11.0	M	52.0	
IRON	10000.		6700.		11000.		12000.	
LEAD	11.0		9.40		24.0		160	
MAGNESIUM	930	M	560	M	1400.	M	5700.	
MANGANESE	370	J	170	J	390	J	230	
MERCURY	0.13	U	0.12	U	0.15	U	0.13	
CELESTINE	8.60	M	5.10	M	13.0	M	45.0	
CAESIUM	410	M	170	M	630	M	970	
SELENIUM	3.30	U	3.00	U	3.90	U	3.20	
SILVER	6.50	U	6.10	U	7.70	U	6.40	
SODIUM	410	M	3000.	U	580	M	1700.	
THALLIUM	6.50	U	6.10	U	7.70	U	6.40	
TIN	N/A	I	N/A	I	N/A	I	N/A	
VANADIUM	21.0	M	13.0	M	22.0	M	24.0	
ZINC	39.0		37.0		550		23000.	
CYANIDE	N/A	I	N/A	I	N/A	I	N/A	

ANALYSIS TYPE: TOTAL METALS (CONTRACTOR)

TITLE: GRIMES PROPERTY

LAB: CHEMTECH

SAMPLE PREF:----- ANALYST/ENTRY: E29

MATRIX: WATER

METHOD: 9001M37

REVIEWER: *FLS*

UNITS: UG/L

CASE: 6370

DATE: 09/25/86

SAMPLE NUMBERS

COMPOUND	AEJ9C007		AEJ9C013F		AEJ9C014		AEJ9C015	
ALUMINUM	1200.		110	M	200	U	200	
ANTIMONY	60.0	U	60.0	U	60.0	U	60.0	
✓ ARSENIC	5.00	M	10.0	U	10.0	U	10.0	
✓ BARIUM	220		200	U	150	M	200	
BERYLLIUM	5.00	U	5.00	U	5.00	U	5.00	
✓ CADMIUM	5.00	U	5.00	U	5.00	U	5.00	
CALCIUM	160000.		1400.	M	57000.		140000	
CHROMIUM	10.0	U	10.0	U	10.0	U	10.0	
COBALT	50.0	U	50.0	U	50.0	U	50.0	
COFFER	25.0	U	25.0	U	34.0		25.0	
IRON	2200.		39.0	M	65.0	M	100	
LEAD	3.00	M	5.00	U	3.00	M	6.00	
MAGNESIUM	38000.		290	M	11000.		47000.	
MANGANESE	4600.		10.0	M	15.0	U	15.0	
MERCURY	0.2	U	0.6		0.2	U	0.2	
NICKEL	40.0	U	40.0	U	40.0	U	40.0	
POTASSIUM	7100.		5000.	U	600	M	1700.	
SELENIUM	5.00	U	5.00	U	5.00	U	5.00	
SILVER	10.0	U	10.0	U	10.0	U	10.0	
TIUM	90000.		5000.	U	9700.		62000.	
THALLIUM	10.0	U	10.0	U	10.0	U	10.0	
TIN	N/A	I	N/A	I	N/A	I	N/A	
VANADIUM	50.0	U	50.0	U	50.0	U	50.0	
ZINC	97.0	U	74.0		120	U	170	
CYANIDE	N/A	I	N/A	I	N/A	I	N/A	

ANALYSIS TYPE: TOTAL METALS (CONTRACTOR)

TITLE: GRIMES PROPERTY

LAB: CHEMTECH

SAMPLE PREP:----- ANALYST/ENTRY: E30

MATRIX: SEDIMENT

METHOD: 9001M07

REVIEWER: *[Signature]*

UNITS: MG/KG

CASE: 6370

DATE: 09/25/86

SAMPLE NUMBERS

COMPOUND	AEJ9C010		AEJ9C010D		AEJ9C011		AEJ9C012
ALUMINUM	12000.		13000.		5000.		10000.
ANTIMONY	13.0	M	34.0	U	35.0	U	32.0
ARSENIC	19.0	J	20.0	J	8.70	J	15.0
BARIUM	500		250		120		710
BERYLLIUM	2.90	U	2.80	U	3.00	U	3.20
CADMIUM	31.0	J	30.0	J	3.50	J	190
CALCIUM	24000.		23000.		120000.		81000.
CHROMIUM	44.0	J	38.0	J	35.0	J	100
COBALT	5.50	M	5.60	M	6.10	M	7.60
COPPER	60.0		55.0		100		180
IRON	29000.		27000.		14000.		36000.
LEAD	160		140		440		520
MAGNESIUM	3500.		3600.		5700.		5900.
MANGANESE	400	J	390	J	220	J	390
MERCURY	0.11	U	0.11	U	0.12	U	0.19
NICKEL	24.0		24.0		42.0		100
POTASSIUM	820	M	840	M	630	M	1100.
SELENIUM	1.60	M	2.90	J	3.00	U	6.60
SILVER	5.70	U	5.60	U	5.90	U	6.40
THALLIUM	700	M	700	M	7600.		990
TALMIUM	5.70	U	5.60	U	5.90	U	6.40
TIN	N/A	I	N/A	I	N/A	I	N/A
VANADIUM	32.0		32.0		13.0	M	25.0
ZINC	5900.		5600.		20000.		20000.
CYANIDE	N/A	I	N/A	I	N/A	I	N/A

Case No.: 6370

Laboratory: Chemtech

Contract No.: SOW 785

Method No.: 9001M07

SMD No.: MGB520-MGB536

EPA No.: AEJ9C

Site: Grimes Property

Matrix: Water and Soil

We have reviewed the above case. The following are our findings:

1. The data were received on time. Analysis was requested for the contract inorganic total metals fraction only.
2. Al was reported in the water and soil matrix calibration and preparation blanks. Al, Ca, Fe, Mg, Mn, Hg and Zn were reported in the water matrix field blank, sample AEJ9C013F/MGB533. The sample data were qualified by the blank rules. There was no soil matrix field blank associated with this data.
3. The water MES recoveries for As and Se exceeded control limits. Soil MES recoveries for Sb, As, Cd, Cr, Mn and Se also exceeded control limits. The sample data were qualified by the MES recovery rules.
4. A water audit was introduced as sample AEJ9C90UP/MGB536. All metals were correctly identified in the audit. There was no soil matrix audit sample associated with this data.

ANALYSIS TYPE: VOLATILE ANALYSES

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: ----- ANALYST/ENTRY: E71

MATRIX: WATER

METHOD: 9302M01

REVIEWER: *SGC/DN*

UNITS: UG/L

CASE: 6370

DATE: 10/08/86

SAMPLE NUMBERS

COMPOUND	AEJ9C002		AEJ9C002D		AEJ9C003		AEJ9C005	
CHLOROMETHANE	10.0	U	10.0	U	10.0	U	10.0	U
BROMOMETHANE	10.0	U	10.0	U	10.0	U	10.0	U
VINYL CHLORIDE	10.0	U	10.0	U	10.0	U	10.0	U
CHLOROETHANE	10.0	U	10.0	U	10.0	U	10.0	U
METHYLENE CHLORIDE	5.00	U	5.00	U	5.00	U	5.00	U
ACETONE	10.0	U	10.0	U	10.0	U	10.0	U
CARBON DISULFIDE	5.00	U	5.00	U	5.00	U	5.00	U
1,1-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
1,1-DICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
TRANS-1,2-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
CHLOROFORM	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
2-BUTANONE		I		I		I		I
1,1,1-TRICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
CARBON TETRACHLORIDE	5.00	U	5.00	U	5.00	U	5.00	U
VINYL ACETATE	10.0	U	10.0	U	10.0	U	10.0	U
BROMODICHLOROMETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2-TETRACHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROPROPANE	5.00	U	5.00	U	5.00	U	5.00	U
CIS-1,3-DICHLOROPROPENE	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
DIBROMOCHLOROMETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-TRICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
BENZENE	5.00	U	5.00	U	5.00	U	5.00	U
CIS-1,3-DICHLOROPROPENE	5.00	U	5.00	U	5.00	U	5.00	U
2-CHLOROETHYL VINYL ETHER		I		I		I		I
BROMOFORM	5.00	U	5.00	U	5.00	U	5.00	U
2-HEXANONE	10.0	U	10.0	U	10.0	U	10.0	U
4-METHYL-2-PENTANONE	10.0	U	10.0	U	10.0	U	10.0	U
TETRACHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
TOLUENE	5.00	U	5.00	U	5.00	U	5.00	U
CHLOROBENZENE	5.00	U	5.00	U	5.00	U	5.00	U
ETHYL BENZENE	5.00	U	5.00	U	5.00	U	5.00	U
STYRENE	5.00	U	5.00	U	5.00	U	5.00	U
TOTAL XYLENES	5.00	U	5.00	U	5.00	U	5.00	U

ANALYSIS TYPE: VOLATILE ANALYSES

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: _____ ANALYST/ENTRY: E68

MATRIX: SEDIMENT

METHOD: 9302M01

REVIEWER: *ALB DM LF*

UNITS: UG/KG

CASE: 6370

DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C004	AEJ9C006	AEJ9C008	AEJ9C009
CHLOROMETHANE	13.0 U	12.0 U	16.0 U	13.0 U
BROMOMETHANE	13.0 U	12.0 U	16.0 U	13.0 U
VINYL CHLORIDE	13.0 U	12.0 U	16.0 U	13.0 U
CHLOROETHANE	13.0 U	12.0 U	16.0 U	13.0 U
METHYLENE CHLORIDE	6.60 U	6.00 U	7.80 U	6.40 U
ACETONE	13.0 U	30.0 U	50.0 U	13.0 U
CARBON DISULFIDE	6.60 U	6.00 U	7.80 U	6.40 U
1,1-DICHLOROETHENE	6.60 U	6.00 U	7.80 U	6.40 U
1,1-DICHLOROETHANE	6.60 U	6.00 U	7.80 U	6.40 U
TRANS-1,2,-DICHLOROETHENE	6.60 U	6.00 U	7.80 U	6.40 U
CHLOROFORM	6.60 U	6.00 U	7.80 U	6.40 U
1,2-DICHLOROETHANE	6.60 U	6.00 U	7.80 U	6.40 U
2-BUTANONE		I 3.10 M	14.0 M	
1,1,1-TRICHLOROETHANE	6.60 U	6.00 U	7.80 U	6.40 U
CARBON TETRACHLORIDE	6.60 U	6.00 U	7.80 U	6.40 U
VINYL ACETATE	13.0 U	12.0 U	16.0 U	13.0 U
BROMODICHLOROMETHANE	6.60 U	6.00 U	7.80 U	6.40 U
1,1,2,2,-TETRACHLOROETHANE	6.60 U	6.00 U	7.80 U	6.40 U
2-DICHLOROPROPANE	6.60 U	6.00 U	7.80 U	6.40 U
CIS-1,3-DICHLOROPROPENE	6.60 U	6.00 U	7.80 U	6.40 U
1,1-DICHLOROETHENE	6.60 U	6.00 U	7.80 U	6.40 U
DIBROMOCHLOROMETHANE	6.60 U	6.00 U	7.80 U	6.40 U
1,1,2-TRICHLOROETHANE	6.60 U	6.00 U	7.80 U	6.40 U
BENZENE	6.60 U	6.00 U	7.80 U	6.40 U
CIS-1,3-DICHLOROPROPENE	6.60 U	6.00 U	7.80 U	6.40 U
2-CHLOROETHYL VINYL ETHER		I		I
BROMOFORM	6.60 U	6.00 U	7.80 U	6.40 U
2-HEXANONE	13.0 U	12.0 U	16.0 U	13.0 U
4-METHYL-2-PENTANONE	13.0 U	12.0 U	16.0 U	13.0 U
TETRACHLOROETHENE	6.60 U	6.00 U	7.80 U	6.40 U
TOLUENE	6.60 U	6.00 U	1600.	6.40 U
CHLOROBENZENE	6.60 U	6.00 U	7.80 U	6.40 U
ETHYL BENZENE	6.60 U	6.00 U	7.80 U	6.40 U
STYRENE	6.60 U	6.00 U	7.80 U	6.40 U
TOTAL XYLENES	6.60 U	6.00 U	7.80 U	6.40 U

ANALYSIS TYPE: VOLATILE ANALYSES

TITLE: GRIMES

LAB: RMA

SAMPLE PREP:----- ANALYST/ENTRY: E71

MATRIX: WATER

METHOD: 9302M00

REVIEWER: *ASD M 4*

UNITS: UG/L

CASE: 6370

DATE: 10/08/86

SAMPLE NUMBERS

COMPOUND	AEJ9C007		AEJ9C013F		AEJ9C014		AEJ9C015	
CHLOROMETHANE	10.0	U	10.0	U	10.0	U	10.0	U
BROMOMETHANE	10.0	U	10.0	U	10.0	U	10.0	U
VINYL CHLORIDE	10.0	U	10.0	U	10.0	U	10.0	U
CHLOROETHANE	10.0	U	10.0	U	10.0	U	10.0	U
METHYLENE CHLORIDE	5.00	U	10.0	U	5.00	U	5.40	U
ACETONE	10.0	U	10.0	U	10.0	U	34.0	U
CARBON DISULFIDE	5.00	U	5.00	U	5.00	U	5.00	U
1,1-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
1,1-DICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
TRANS-1,2,-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
CHLOROFORM	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
2-BUTANONE		I		I		I	80.0	U
1,1,1-TRICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
CARBON TETRACHLORIDE	5.00	U	5.00	U	5.00	U	5.00	U
VINYL ACETATE	10.0	U	10.0	U	10.0	U	10.0	U
BROMODICHLOROMETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2,-TETRACHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROPROPANE	5.00	U	5.00	U	5.00	U	5.00	U
TRANS-1,3-DICHLOROPROPENE	5.00	U	5.00	U	5.00	U	5.00	U
1,2-DICHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
DIBROMOCHLOROMETHANE	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-TRICHLOROETHANE	5.00	U	5.00	U	5.00	U	5.00	U
BENZENE	5.00	U	5.00	U	5.00	U	5.00	U
CIS-1,3-DICHLOROPROPENE	5.00	U	5.00	U	5.00	U	5.00	U
2-CHLOROETHYL VINYL ETHER		I		I		I		I
BROMOFORM	5.00	U	5.00	U	5.00	U	5.00	U
2-HEXANONE	10.0	U	10.0	U	10.0	U	10.0	U
4-METHYL-2-PENTANONE	10.0	U	10.0	U	10.0	U	10.0	U
TETRACHLOROETHENE	5.00	U	5.00	U	5.00	U	5.00	U
TOLUENE	5.00	U	2.60	M	5.00	U	5.00	U
CHLOROBENZENE	5.00	U	5.00	U	5.00	U	5.00	U
ETHYL BENZENE	5.00	U	5.00	U	5.00	U	5.00	U
STYRENE	5.00	U	5.00	U	5.00	U	5.00	U
TOTAL XYLENES	5.00	U	5.00	U	5.00	U	5.00	U

ANALYSIS TYPE: VOLATILE ANALYSES

TITLE: GRIMES
 LAB: RMA
 SAMPLE PREP: ----- ANALYST/ENTRY: E68

MATRIX: SEDIMENT
 METHOD: 9302M01
 REVIEWER: *EA D. L.*

UNITS: UG/KG
 CASE: 6370
 DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C010		AEJ9C010D		AEJ9C011		AEJ9C012	
CHLOROMETHANE	11.0	U	11.0	U	12.0	U	13.0	U
BROMOMETHANE	11.0	U	11.0	U	12.0	U	13.0	U
VINYL CHLORIDE	11.0	U	11.0	U	12.0	U	13.0	U
CHLOROETHANE	11.0	U	11.0	U	12.0	U	13.0	U
METHYLENE CHLORIDE	13.0	U	5.70	U	5.80	U	6.40	U
ACETONE	11.0	U	12.0	U	53.0	U	13.0	U
CARBON DISULFIDE	5.70	U	5.70	U	5.80	U	6.40	U
1,1 DICHLOROETHENE	5.70	U	5.70	U	5.80	U	6.40	U
1,1 DICHLOROETHANE	5.70	U	5.70	U	5.80	U	6.40	U
TRANS-1,2,-DICHLOROETHENE	5.70	U	5.70	U	5.80	U	6.40	U
CHLOROFORM	5.70	U	5.70	U	5.80	U	6.40	U
1,2,DICHLOROETHANE	5.70	U	5.70	U	5.80	U	6.40	U
2-BUTANONE		I		I		I		I
1,1,1 TRICHLOROETHANE	5.70	U	5.70	U	5.80	U	6.40	U
CARBON TETRACHLORIDE	5.70	U	5.70	U	5.80	U	6.40	U
VINYL ACETATE	11.0	U	11.0	U	12.0	U	13.0	U
BROMODICHLOROMETHANE	5.70	U	5.70	U	5.80	U	6.40	U
1,1,2,2,-TETRACHLOROETHANE	5.70	U	5.70	U	5.80	U	6.40	U
1,2-DICHLOROPROPANE	5.70	U	5.70	U	5.80	U	6.40	U
TRANS-1,3-DICHLOROPROPENE	5.70	U	5.70	U	5.80	U	6.40	U
1,1,1,2-TETRACHLOROETHANE	5.70	U	5.70	U	70.0	U	6.40	U
1,1,2-TRICHLOROETHANE	5.70	U	5.70	U	5.80	U	6.40	U
BENZENE	5.70	U	5.70	U	9.00	U	6.40	U
CIS-1,3-DICHLOROPROPENE	5.70	U	5.70	U	5.80	U	6.40	U
2-CHLOROETHYL VINYL ETHER		I		I		I		I
BROMOFORM	5.70	U	5.70	U	5.80	U	6.40	U
2-HEXANONE	11.0	U	11.0	U	12.0	U	13.0	U
4-METHYL-2-PENTANONE	11.0	U	11.0	U	12.0	U	13.0	U
TETRACHLOROETHENE	5.70	U	5.70	U	5.80	U	6.40	U
TOLUENE	5.70	U	5.70	U	93.0	U	6.40	U
CHLOROBENZENE	5.70	U	5.70	U	5.80	U	6.40	U
ETHYL BENZENE	5.70	U	5.70	U	59.0	U	6.40	U
STYRENE	5.70	U	5.70	U	16.0	U	6.40	U
TOTAL XYLENES	5.70	U	5.70	U	91.0	U	6.40	U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 1)

E: GRIMES
L. RMA
SAMPLE PREP: ----- ANALYST/ENTRY: E72

MATRIX: WATER
METHOD: 9302M0
REVIEWER: *RLA* *DLF*
UNITS: UG/L
CASE: 6370
DATE: 10/08/86

SAMPLE NUMBERS

COMPOUND	AEJ9C002		AEJ9C002D		AEJ9C003		AEJ9C005	
PHENOL	40.0	U	20.0	U	20.0	U	20.0	U
BIS(2-CHLOROETHYL) ETHER	40.0	U	20.0	U	20.0	U	20.0	U
2-CHLOROPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
1,3-DICHLOROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
1,4-DICHLOROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
BENZYL ALCOHOL	40.0	U	20.0	U	20.0	U	20.0	U
1,2-DICHLOROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
2-METHYLPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
BIS(2-CHLOROISOPROPYL) ETHER	40.0	U	20.0	U	20.0	U	20.0	U
4-METHYLPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
N-NITROSO-DIPROPYLAMINE	40.0	U	20.0	U	20.0	U	20.0	U
HEXACHLOROETHANE	40.0	U	20.0	U	20.0	U	20.0	U
NITROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
ISOPHORONE	40.0	U	20.0	U	20.0	U	20.0	U
2-NITROPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
4-DIMETHYLPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
BOIC ACID	200	U	100	U	100	U	100	U
(2-CHLOROETHOXY) METHANE	40.0	U	20.0	U	20.0	U	20.0	U
2,4-DICHLOROPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
1,2,4-TRICHLOROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
NAFHTHALENE	40.0	U	20.0	U	20.0	U	20.0	U
4-CHLOROANILINE	40.0	U	20.0	U	20.0	U	20.0	U
HEXACHLOROBUTADIENE	40.0	U	20.0	U	20.0	U	20.0	U
4-CHLORO-3-METHYLPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
2-METHYLNAPHTHALENE	40.0	U	20.0	U	20.0	U	20.0	U
HEXACHLOROCYCLOPENTADIENE	40.0	U	20.0	U	20.0	U	20.0	U
2,4,6-TRICHLOROPHENOL	40.0	U	20.0	U	20.0	U	20.0	U
2,4,5-TRICHLOROPHENOL	200	U	100	U	100	U	100	U
2-CHLORONAPHTHALENE	40.0	U	20.0	U	20.0	U	20.0	U
2-NITROANILINE	200	U	100	U	100	U	100	U
DIMETHYLPHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
ACENAPHTHYLENE	40.0	U	20.0	U	20.0	U	20.0	U
3-NITROANILINE	200	U	100	U	100	U	100	U
ACENAPHTHENE	40.0	U	20.0	U	20.0	U	20.0	U
2,4-DINITROPHENOL	200	U	100	U	100	U	100	U
4-NITROPHENOL	200	U	100	U	100	U	100	U
DIBENZOFURAN	40.0	U	20.0	U	20.0	U	20.0	U
2,4-DINITROTOLUENE	40.0	U	20.0	U	20.0	U	20.0	U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 2)

E: GRIMES

RMA

SAMPLE PREP:----- ANALYST/ENTRY: E73

MATRIX: WATER

METHOD: 9302M01

REVIEWER: *asa* *DJL*

UNITS: UG/L

CASE: 6370

DATE: 10/08/86

SAMPLE NUMBERS

COMPOUND	AEJ9C002		AEJ9C002D		AEJ9C003		AEJ9C005	
2,6-DINITROTOLUENE	40.0	U	20.0	U	20.0	U	20.0	U
DIETHYLPHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
4-CHLOROPHENYL PHENYL ETHER	40.0	U	20.0	U	20.0	U	20.0	U
FLUORENE	40.0	U	20.0	U	20.0	U	20.0	U
4-NITROANILINE	200	U	100	U	100	U	100	U
4,6-DINITRO-2-METHYLPHENOL	200	U	100	U	100	U	100	U
N-NITROSODIPHENYLAMINE	40.0	U	20.0	U	20.0	U	20.0	U
4-BROMOPHENYL PHENYL ETHER	40.0	U	20.0	U	20.0	U	20.0	U
HEXACHLOROBENZENE	40.0	U	20.0	U	20.0	U	20.0	U
PENTACHLOROPHENOL	200	U	100	U	100	U	100	U
PHENANTHRENE	40.0	U	20.0	U	20.0	U	20.0	U
ANTHRACENE	40.0	U	20.0	U	20.0	U	20.0	U
DI-N-BUTYLPHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
FLUORANTHENE	40.0	U	20.0	U	20.0	U	20.0	U
PYRENE	40.0	U	20.0	U	20.0	U	20.0	U
BUTYL BENZYL PHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
DICHLOROBENZIDINE	80.0	U	40.0	U	40.0	U	40.0	U
20(A)ANTHRACENE	40.0	U	20.0	U	20.0	U	20.0	U
BIS(2-ETHYLHEXYL)PHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
CHRYSENE	40.0	U	20.0	U	20.0	U	20.0	U
DI-N-OCTYL PHTHALATE	40.0	U	20.0	U	20.0	U	20.0	U
BENZO(B)FLUORANTHENE	40.0	U	20.0	U	20.0	U	20.0	U
BENZO(K)FLUORANTHENE	40.0	U	20.0	U	20.0	U	20.0	U
BENZO(A)PYRENE	40.0	U	20.0	U	20.0	U	20.0	U
INDENO(1,2,3-CD)PYRENE	40.0	U	20.0	U	20.0	U	20.0	U
DIBENZO(A,H)ANTHRACENE	40.0	U	20.0	U	20.0	U	20.0	U
BENZO(G,H,I)PERYLENE	40.0	U	20.0	U	20.0	U	20.0	U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 1)

E: GRIMES
: RMA

MATRIX: SEDIMENT

UNITS: UG/KG

SAMPLE PREF:----- ANALYST/ENTRY: E69

METHOD: 9302M04
REVIEWER: *ELI-D-47*

CASE: 6370

DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C004	AEJ9C006	AEJ9C008	AEJ9C009				
PHENOL	430	U	400	U	510	U	420	U
BIS(2-CHLOROETHYL) ETHER	430	U	400	U	510	U	420	U
2-CHLOROPHENOL	430	U	400	U	510	U	420	U
1,3-DICHLOROBENZENE	430	U	400	U	510	U	420	U
1,4-DICHLOROBENZENE	430	U	400	U	510	U	420	U
BENZYL ALCOHOL	430	U	400	U	510	U	420	U
1,2-DICHLOROBENZENE	430	U	400	U	510	U	420	U
2-METHYLPHENOL	430	U	400	U	510	U	420	U
BIS(2-CHLOROISOPROPYL) ETHER	430	U	400	U	510	U	420	U
4-METHYLPHENOL	430	U	400	U	220	M	420	U
N-NITROSO-DIPROPYLAMINE	430	U	400	U	510	U	420	U
HEXACHLOROETHANE	430	U	400	U	510	U	420	U
NITROBENZENE	430	U	400	U	510	U	420	U
ISOPHORONE	430	U	400	U	510	U	420	U
2-NITROPHENOL	430	U	400	U	510	U	420	U
4-DIMETHYLPHENOL	430	U	400	U	510	U	420	U
SOIC ACID	2100.	U	1900.	U	2500.	U	2000.	U
(2-CHLOROETHOXY) METHANE	430	U	400	U	510	U	420	U
2,4-DICHLOROPHENOL	430	U	400	U	510	U	420	U
1,2,4-TRICHLOROBENZENE	430	U	400	U	510	U	420	U
NAFTHALENE	430	U	400	U	510	U	420	U
4-CHLOROANILINE	430	U	400	U	510	U	420	U
HEXACHLOROBTADIENE	430	U	400	U	510	U	420	U
4-CHLORO-3-METHYLPHENOL	430	U	400	U	510	U	420	U
2-METHYLNAPHTHALENE	430	U	400	U	510	U	420	U
HEXACHLOROCYCLOPENTADIENE	430	U	400	U	510	U	420	U
2,4,6-TRICHLOROPHENOL	430	U	400	U	510	U	420	U
2,4,5-TRICHLOROPHENOL	2100.	U	1900.	U	2500.	U	2000.	U
2-CHLORONAPHTHALENE	430	U	400	U	510	U	420	U
2-NITROANILINE	2100.	U	1900.	U	2500.	U	2000.	U
DIMETHYLPHTHALATE	430	U	400	U	510	U	420	U
ACENAPHTHYLENE	430	U	400	U	510	U	420	U
3-NITROANILINE	2100.	U	1900.	U	2500.	U	2000.	U
ACENAPHTHENE	430	U	400	U	510	U	420	U
2,4-DINITROPHENOL	2100.	U	1900.	U	2500.	U	2000.	U
4-NITROPHENOL	2100.	U	1900.	U	2500.	U	2000.	U
DIBENZOFURAN	430	U	400	U	510	U	420	U
2,4-DINITROTOLUENE	430	U	400	U	510	U	420	U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 2)

T : GRIMES
RMA

SAMPLE PREP: ----- ANALYST/ENTRY: E70

MATRIX: SEDIMENT

METHOD: 9302M01

REVIEWER: *ASA-DIT*

UNITS: UG/KG

CASE: 6370

DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C004	AEJ9C006	AEJ9C008	AEJ9C009
2,6-DINITROTOLUENE	430 U	400 U	510 U	420 U
DIETHYLFTHALATE	430 U	400 U	510 U	420 U
4-CHLOROPHENYL PHENYL ETHER	430 U	400 U	510 U	420 U
FLUORENE	430 U	400 U	510 U	420 U
4-NITROANILINE	2100. U	1900. U	2500. U	2000. U
4,6-DINITRO-2-METHYLPHENOL	2100. U	1900. U	2500. U	2000. U
N-NITROSODIPHENYLAMINE	430 U	400 U	510 U	420 U
4-BROMOPHENYL PHENYL ETHER	430 U	400 U	510 U	420 U
HEXACHLOROBENZENE	430 U	400 U	510 U	420 U
PENTACHLOROPHENOL	2100. U	1900. U	2500. U	2000. U
PHENANTHRENE	430 U	400 U	510 U	420 U
ANTHRACENE	430 U	400 U	510 U	420 U
DI-N-BUTYLFTHALATE	430 U	400 U	510 U	420 U
FLUORANTHENE	430 U	400 U	510 U	420 U
PYRENE	430 U	400 U	510 U	78.0 M
BUTYL BENZYL FHTHALATE	430 U	400 U	510 U	420 U
DICHLOROBENZIIDINE	860 U	790 U	1000. U	840 U
1,2-D(A)ANTHRACENE	430 U	400 U	510 U	420 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	78.0 M	470 M	120 M
CHRYSENE	430 U	400 U	510 U	420 U
DI-N-OCTYL FHTHALATE	430 U	400 U	76.0 M	320 M
BENZO(B)FLUDRANTHENE	430 U	400 U	510 U	420 U
BENZO(K)FLUDRANTHENE	430 U	400 U	510 U	420 U
BENZO(A)PYRENE	430 U	400 U	510 U	420 U
INDENO(1,2,3-CD)PYRENE	430 U	400 U	510 U	420 U
DIBENZO(A,H)ANTHRACENE	430 U	400 U	510 U	420 U
BENZO(G,H,I)PERYLENE	430 U	400 U	510 U	75.0 M

ANALYSIS TYPE: SEMIVOLATILES (PAGE 1)

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: ----- ANALYST/ENTRY: E72

MATRIX: WATER

METHOD: 9302M01

REVIEWER: *PLF*

UNITS: UG/L

CASE: 6370

DATE: 10/08/89

SAMPLE NUMBERS

COMPOUND	AEJ9C007		AEJ9C013F		AEJ9C014		AEJ9C01
PHENOL	20.0	U	20.0	U	20.0	U	20.0
BIS(2-CHLOROETHYL) ETHER	20.0	U	20.0	U	20.0	U	20.0
2-CHLOROPHENOL	20.0	U	20.0	U	20.0	U	20.0
1,3-DICHLOROBENZENE	20.0	U	20.0	U	20.0	U	20.0
1,4-DICHLOROBENZENE	20.0	U	20.0	U	20.0	U	20.0
BENZYL ALCOHOL	20.0	U	20.0	U	20.0	U	20.0
1,2-DICHLOROBENZENE	20.0	U	20.0	U	20.0	U	20.0
2-METHYLPHENOL	20.0	U	20.0	U	20.0	U	20.0
BIS(2-CHLOROISOPROPYL) ETHER	20.0	U	20.0	U	20.0	U	20.0
4-METHYLPHENOL	20.0	U	20.0	U	20.0	U	20.0
N-NITROSO-DIPROPYLAMINE	20.0	U	20.0	U	20.0	U	20.0
HEXACHLOROETHANE	20.0	U	20.0	U	20.0	U	20.0
NITROBENZENE	20.0	U	20.0	U	20.0	U	20.0
ISOPHORONE	20.0	U	20.0	U	20.0	U	20.0
2-NITROPHENOL	20.0	U	20.0	U	20.0	U	20.0
2,4-DIMETHYLPHENOL	20.0	U	20.0	U	20.0	U	20.0
BENZOIC ACID	4.40	M	100	U	100	U	100
BIS(2-CHLOROETHOXY) METHANE	20.0	U	20.0	U	20.0	U	20.0
2,4-DICHLOROPHENOL	20.0	U	20.0	U	20.0	U	20.0
1,2,4-TRICHLOROBENZENE	20.0	U	20.0	U	20.0	U	20.0
1-NAPHTHALENE	20.0	U	20.0	U	20.0	U	20.0
4-CHLOROANILINE	20.0	U	20.0	U	20.0	U	20.0
HEXACHLOROCYCLOPENTADIENE	20.0	U	20.0	U	20.0	U	20.0
4-CHLORO-3-METHYLPHENOL	20.0	U	20.0	U	20.0	U	20.0
2-METHYLNAPHTHALENE	20.0	U	20.0	U	20.0	U	20.0
HEXACHLOROCYCLOPENTADIENE	20.0	U	20.0	U	20.0	U	20.0
2,4,6-TRICHLOROPHENOL	20.0	U	20.0	U	20.0	U	20.0
2,4,5-TRICHLOROPHENOL	100	U	100	U	100	U	100
2-CHLORONAPHTHALENE	20.0	U	20.0	U	20.0	U	20.0
2-NITROANILINE	100	U	100	U	100	U	100
DIMETHYLFTHALATE	20.0	U	20.0	U	20.0	U	20.0
ACENAPHTHYLENE	20.0	U	20.0	U	20.0	U	20.0
3-NITROANILINE	100	U	100	U	100	U	100
ACENAPHTHENE	20.0	U	20.0	U	20.0	U	20.0
2,4-DINITROPHENOL	100	U	100	U	100	U	100
4-NITROPHENOL	100	U	100	U	100	U	100
DIBENZOFURAN	20.0	U	20.0	U	20.0	U	20.0
2,4-DINITROTOLUENE	20.0	U	20.0	U	20.0	U	20.0

ANALYSIS TYPE: SEMI-VOLATILES (PAGE 2)

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: _____ ANALYST/ENTRY: E73

MATRIX: WATER

METHOD: 9302M

REVIEWER: *[Signature]*

UNITS: UG/L

CASE: 6370

DATE: 10/08/81

SAMPLE NUMBERS

COMPOUND	AEJ9C007	AEJ9C013F	AEJ9C014	AEJ9C015
2,6-DINITROTOLUENE	20.0 U	20.0 U	20.0 U	20.0 U
DIETHYLPHTHALATE	20.0 U	20.0 U	20.0 U	20.0 U
4-CHLOROPHENYL PHENYL ETHER	20.0 U	20.0 U	20.0 U	20.0 U
FLUORENE	20.0 U	20.0 U	20.0 U	20.0 U
4-NITROANILINE	100 U	100 U	100 U	100 U
4,6-DINITRO-2-METHYLPHENOL	100 U	100 U	100 U	100 U
N-NITROSODIPHENYLAMINE	20.0 U	20.0 U	20.0 U	20.0 U
4-BROMOPHENYL PHENYL ETHER	20.0 U	20.0 U	20.0 U	20.0 U
HEXACHLOROBENZENE	20.0 U	20.0 U	20.0 U	20.0 U
PENTACHLOROPHENOL	100 U	100 U	100 U	100 U
PHENANTHRENE	20.0 U	20.0 U	20.0 U	20.0 U
ANTHRACENE	20.0 U	20.0 U	20.0 U	20.0 U
DI-N-BUTYLPHTHALATE	20.0 U	20.0 U	20.0 U	20.0 U
FLUORANTHENE	20.0 U	20.0 U	20.0 U	20.0 U
PYRENE	20.0 U	20.0 U	20.0 U	20.0 U
BUTYL BENZYL PHTHALATE	20.0 U	20.0 U	20.0 U	20.0 U
3,3' DICHLORO BENZIDINE	40.0 U	40.0 U	40.0 U	40.0 U
BENZO(A)ANTHRACENE	20.0 U	20.0 U	20.0 U	20.0 U
BIS(2-ETHYLHEXYL)PHTHALATE	20.0 U	2.90 M	20.0 U	20.0 U
RYSENE	20.0 U	20.0 U	20.0 U	20.0 U
-N-OCTYL PHTHALATE	20.0 U	20.0 U	20.0 U	20.0 U
BENZO(B)FLUORANTHENE	20.0 U	20.0 U	20.0 U	20.0 U
BENZO(K)FLUORANTHENE	20.0 U	20.0 U	20.0 U	20.0 U
BENZO(A)PYRENE	20.0 U	20.0 U	20.0 U	20.0 U
INDENO(1,2,3-CD)PYRENE	20.0 U	20.0 U	20.0 U	20.0 U
DIBENZO(A,H)ANTHRACENE	20.0 U	20.0 U	20.0 U	20.0 U
BENZO(G,H,I)PERYLENE	20.0 U	20.0 U	20.0 U	20.0 U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 1)

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: ----- ANALYST/ENTRY: E69

MATRIX: SEDIMENT

METHOD: 9302M01

REVIEWER: *EGZ DPT*

UNITS: UG/KG

CASE: 6370

DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C010		AEJ9C010D		AEJ9C011		AEJ9C012	
PHENOL	370	U	370	U	15000.	U	2100.	U
BIS(2-CHLOROETHYL) ETHER	370	U	370	U	15000.	U	2100.	U
2-CHLOROPHENOL	370	U	370	U	15000.	U	2100.	U
1,3-DICHLOROBENZENE	370	U	370	U	15000.	U	2100.	U
1,4-DICHLOROBENZENE	370	U	370	U	15000.	U	2100.	U
BENZYL ALCOHOL	370	U	370	U	15000.	U	2100.	U
1,2-DICHLOROBENZENE	370	U	370	U	15000.	U	2100.	U
2-METHYLPHENOL	370	U	370	U	15000.	U	2100.	U
BIS(2-CHLOROISOPROPYL) ETHER	370	U	370	U	15000.	U	2100.	U
4-METHYLPHENOL	370	U	370	U	15000.	U	2100.	U
N-NITROSO-DIPROPYLAMINE	370	U	370	U	15000.	U	2100.	U
HEXACHLOROETHANE	370	U	370	U	15000.	U	2100.	U
NITROBENZENE	370	U	370	U	15000.	U	2100.	U
ISOPHORONE	370	U	370	U	15000.	U	2100.	U
2-NITROPHENOL	370	U	370	U	15000.	U	2100.	U
2,4-DIMETHYLPHENOL	370	U	370	U	15000.	U	2100.	U
BENZOIC ACID	1800.	U	1800.	U	74000.	U	10000.	U
BIS(2-CHLOROETHOXY) METHANE	370	U	370	U	15000.	U	2100.	U
2,4-DICHLOROPHENOL	370	U	370	U	15000.	U	2100.	U
1,4-TRICHLOROBENZENE	370	U	370	U	15000.	U	2100.	U
1,4-NAPHTHALENE	370	U	370	U	2800.	M	2100.	U
4-CHLOROANILINE	370	U	370	U	15000.	U	2100.	U
HEXACHLOROBUTADIENE	370	U	370	U	15000.	U	2100.	U
4-CHLORO-3-METHYLPHENOL	370	U	370	U	15000.	U	2100.	U
2-METHYLNAPHTHALENE	370	U	370	U	5100.	M	2100.	U
HEXACHLOROCYCLOPENTADIENE	370	U	370	U	15000.	U	2100.	U
2,4,6-TRICHLOROPHENOL	370	U	370	U	15000.	U	2100.	U
2,4,5-TRICHLOROPHENOL	1800.	U	1800.	U	74000.	U	10000.	U
2-CHLORONAPHTHALENE	370	U	370	U	15000.	U	2100.	U
2-NITROANILINE	1800.	U	1800.	U	74000.	U	10000.	U
DIMETHYLNAPHTHALATE	370	U	370	U	15000.	U	2100.	U
ACENAPHTHYLENE	370	U	370	U	15000.	U	2100.	U
3-NITROANILINE	1800.	U	1800.	U	74000.	U	10000.	U
ACENAPHTHENE	370	U	370	U	15000.	U	2100.	U
2,4-DINITROPHENOL	1800.	U	1800.	U	74000.	U	10000.	U
4-NITROPHENOL	1800.	U	1800.	U	74000.	U	10000.	U
DIPENZOFURAN	370	U	370	U	15000.	U	2100.	U
2,4-DINITROTOLUENE	370	U	370	U	15000.	U	2100.	U

ANALYSIS TYPE: SEMIVOLATILES (PAGE 2)

TITLE: GRIMES

LAB: RMA

SAMPLE PREP: ----- ANALYST/ENTRY: E70

MATRIX: SEDIMENT

METHOD: 9302M04

REVIEWER: *REM DLT*

UNITS: UG/KG

CASE: 6370

DATE: 10/07/86

SAMPLE NUMBERS

COMPOUND	AEJ9C010		AEJ9C010D		AEJ9C011		AEJ9C012	
2,6-DINITROTOLUENE	370	U	370	U	15000.	U	2100.	U
DIETHYLPHTHALATE	370	U	370	U	15000.	U	2100.	U
4-CHLOROPHENYL PHENYL ETHER	370	U	370	U	15000.	U	2100.	U
FLUORENE	370	U	370	U	15000.	U	2100.	U
4-NITROANILINE	1800.	U	1800.	U	74000.	U	10000.	U
4,6-DINITRO-2-METHYLPHENOL	1800.	U	1800.	U	74000.	U	10000.	U
N-NITROSODIPHENYLAMINE	370	U	370	U	15000.	U	2100.	U
4-BROMOPHENYL PHENYL ETHER	370	U	370	U	15000.	U	2100.	U
HEXACHLOROBENZENE	370	U	370	U	15000.	U	2100.	U
PENTACHLOROPHENOL	1800.	U	1800.	U	74000.	U	10000.	U
PHENANTHRENE	48.0	M	45.0	M	2600.	M	230	M
ANTHRACENE	370	U	370	U	15000.	U	2100.	U
DI-N-BUTYLPHTHALATE	370	U	370	U	15000.	U	2100.	U
FLUORANTHENE	370	U	370	U	1700.	M	2100.	U
PYRENE	44.0	M	370	U	4000.	M	2100.	U
BUTYL BENZYL PHTHALATE	370	U	370	U	15000.	U	2100.	U
3,3'-DICHLOROBENZIDINE	750	U	750	U	30000.	U	4200.	U
BENZO(A)ANTHRACENE	370	U	370	U	15000.	U	2100.	U
PTS(2-ETHYLHEXYL)PHTHALATE	190	M	93.0	M	15000.	U	6200.	U
SENE	52.0	M	44.0	M	15000.	U	2100.	U
N-OCTYL PHTHALATE	180	M	82.0	M	15000.	U	7300.	U
BENZO(B)FLUORANTHENE	370	U	370	U	15000.	U	2100.	U
BENZO(K)FLUORANTHENE	370	U	370	U	15000.	U	2100.	U
BENZO(A)PYRENE	370	U	370	U	15000.	U	2100.	U
INDENO(1,2,3-CD)PYRENE	370	U	370	U	15000.	U	2100.	U
DIBENZO(A,H)ANTHRACENE	370	U	370	U	15000.	U	2100.	U
BENZO(G,H,I)PERYLENE	370	U	370	U	15000.	U	2100.	U

TITLE: GRIMES
LAB: RMA
ANALYST/ENTRY: LT

MATRIX: WATER
METHOD: 9302M01
REVIEWER: BGM *Dm*

UNITS: UG/L
CASE: 6370
DATE: 10-8-86

TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.	COMPOUND NAME**	FRACTION	EST.	CONC.*
AEJ9C002	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C002	CYCLOHEXANONE	BNA	18	J
AEJ9C002	HEXANEDIOIC ACID	BNA	19	J
AEJ9C002D	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C002D	HEXAMETHYL-CYCLOTRISILOXANE	BNA	9.8	J
AEJ9C002D	METHYL-CYCLOPENTANOL	BNA	9.4	J
AEJ9C003	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C003	CYCLOHEXANONE	BNA	10	J
AEJ9C005	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C005	HEXANEDIOIC ACID	BNA	19	J
AEJ9C005	CYCLOHEXANONE	BNA	12	J
AEJ9C007	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C007	METHYL-CYCLOPENTANOL	BNA	14	J
AEJ9C007	CYCLOHEXANONE	BNA	9	J
AEJ9C013F	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C013F	METHYL-CYCLOPENTANOL	BNA	14	J
AEJ9C013F	CYCLOHEXANONE	BNA	11	J
AEJ9C014	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C015	METHYLESTER, BUTANOIC ACID	VOA	3.8	J
AEJ9C015	CYCLOHEXANONE	BNA	13	J
AEJ9C015	METHYL BENZENE	BNA	15	J
AEJ9C002	UNKNOWN	BNA	19	J
AEJ9C002D	UNKNOWN	BNA	9.8	J
AEJ9C002D	UNKNOWN	BNA	9.4	J
AEJ9C003	UNKNOWN	BNA	11	J
AEJ9C003	UNKNOWN	BNA	7.2	J
AEJ9C005	4 UNKNOWN	BNA	8.2-28	J
AEJ9C007	UNKNOWN	BNA	46	J
AEJ9C014	UNKNOWN	BNA	13	J
AEJ9C015	2 UNKNOWN	VOA	3.0, 3.8	J
AEJ9C015	UNKNOWN	BNA	21	J

*This is a crude estimation based on response relative to an internal standard. An authentic standard has not been run.

**The compounds were identified using a library search routine. Authentic standards have not been analyzed to verify compound mass spectra and retention times.

TITLE: GRIMES
LAB: RMA
ANALYST/ENTRY: LT

MATRIX: SEDIMENT
METHOD: 9302M01
REVIEWER: GCS

UNITS: UG/KG
CASE: 6370
DATE: 10-7-86

Qn

TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.	COMPOUND NAME**	FRACTION	EST.	CONC.*
AEJ9C004	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C004	HEXADECANOIC ACID	BNA	240	J
AEJ9C004	MOLECULAR SULFUR	BNA	7700	J
AEJ9C004	CHOLESTANOL	BNA	240	J
AEJ9C004	TRITERPENE	BNA	1300	J
AEJ9C006	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C006	MOLECULAR SULFUR	BNA	2900	J
AEJ9C006	HEXADECANOIC ACID	BNA	330	J
AEJ9C006	STIGMASTENONE	BNA	740	J
AEJ9C008	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C008	TETRADECANOIC ACID	BNA	300	J
AEJ9C008	FENTADECANOIC ACID	BNA	510	J
AEJ9C008	HEXADECANOIC ACID	BNA	1200	J
AEJ9C008	MOLECULAR SULFUR	BNA	8800	J
AEJ9C008	OCTADECANOIC ACID	BNA	540	J
AEJ9C009	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C009	HEXADECANOIC ACID	BNA	500	J
AEJ9C009	OCTADECANOIC ACID	BNA	540	J
AEJ9C009	C-4 SUBSTITUTED PHENANTHRENE	BNA	320	J
AEJ9C009	SUBSTITUTED PYRRIDINE	BNA	500	J
AEJ9C009	STIGMASTENONE	BNA	870	J
AEJ9C010	NOTHING SIGNIFICANT FOUND	VOA		
AEJ9C010	TRITERPENE	BNA	2100	J
AEJ9C004	17 UNKNOWNNS	BNA	210-2500	J
AEJ9C006	4 UNKNOWNNS	BNA	160-3900	J
AEJ9C008	16 UNKNOWNNS	BNA	220-2300	J
AEJ9C009	16 UNKNOWNNS	BNA	170-1800	J
AEJ9C010	19 UNKNOWNNS	BNA	170-1200	J

*This is a crude estimation based on response relative to an internal standard. An authentic standard has not been run.

**The compounds were identified using a library search routine. Authentic standards have not been analyzed to verify compound mass spectra and retention times.

TITLE: GRIMES
LAB: RMA
ANALYST/ENTRY: LT

MATRIX: SEDIMENT
METHOD: 9302M01
REVIEWER: GCS *DM*

UNITS: UG/KG
CASE: 6370
DATE: 10-7-86

TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.	COMPOUND NAME**	FRACTION	EST.	CONC.*
AEJ9C010D	NOTHING SIGNIFICANT FOUND	VDA		
AEJ9C010D	METHYL BENZENE	BNA	310	J
AEJ9C010D	DIMETHYL BENZENE	BNA	160	J
AEJ9C010D	TRITERPENE	BNA	2950	J
AEJ9C011	FENTANE	VDA	8.4	J
AEJ9C011	HEXANE	VDA	4.0	J
AEJ9C011	PROPYL-BENZENE	VDA	20	J
AEJ9C012	NOTHING SIGNIFICANT FOUND	VDA		
AEJ9C010D	11 UNKNOWNS	BNA	220-1000	J
AEJ9C011	2 UNKNOWNS	VDA	6.1,7.6	J
AEJ9C011	23 UNKNOWNS	BNA	17000-1000000	J
AEJ9C012	6 UNKNOWNS	BNA	1700-360000	J

*This is a crude estimation based on response relative to an internal standard. An authentic standard has not been run.

**The compounds were identified using a library search routine. Authentic standards have not been analyzed to verify compound mass spectra and retention times.

Case No.: 6370

Laboratory: RMA

Contract No.: 68-01-7016

Method No.: 9302M01

SMO No.: GA929,931,933-938

EPA No.: AEJ9C

Site: Grimes

Matrix: Soil

We have reviewed the above case. The following are our findings:

1. Analysis was requested on the base-neutral/acid fraction of eight soil samples.
2. Some detection limits are higher than the CRDL because the final extracts were diluted to avoid precipitation.
3. Methylene Chloride and Acetone were found in the method blanks. The blank rules were used to qualify the associated data.
4. Several compounds were outside of data review control limits in the initial and continuing calibrations. The calibration rules were used to qualify the associated data.
5. There were no field blanks nor performance evaluation samples associated with this sample set.

Case No.: 6370

Laboratory: RMA

Contract No.: 68-01-7016

Method No.: 9302M01

SMD No.: GA926-8,930,932,940-42

EPA No.: AEJ9C

Site: Grimes

Matrix: Water

We have reviewed the above case. The following are our findings:

1. This portion of the case consisted of nine water samples for base-neutrals and acids.
2. Methylene Chloride, Acetone, Toluene, 4-Methyl-2-Pentanol, 2-Hexanol and bis(2-Ethylhexyl)Phthalate were found in the method and field blanks. The blank rules were applied to the associated data.
3. Several compounds were outside of data review control limits in the initial and continuing calibrations. The calibration rules were used to qualify the associated data.
4. A field blank was included in this sample set as sample AEJ9C013F/GA939.
5. A performance evaluation sample was included in this set as AEJ9C900P/GA942. All compounds were found.

APPENDIX C

Sample Field Sheets

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Site Name: Grimes Property
Location: Keokuk Iowa

Site Number: 9C
Site Code: AEJ

Collected: YR: 86 MO: 08 Day: 26 Time: 1345 Leader: Hudson

Sample Number: AEJ9C0/4

SMD #:

Sample Media (circle one):

SOIL, DUST, RINSATE, SEDIMENT, WATER, OTHER: _____

Sample Split (circle one): YES NO

Sample Container : Tag Color : Preservative : Analysis Requested

1 LITER CUBI	WHITE	HNO3/ICE	TOTAL METALS
80oz. BOTTLE	PURPLE	ICE	A/E/N
VDA SET	PURPLE	ICE	VDA
	<u>LIME</u>		
	<u>MR</u>		

Depth: _____ Pan #: _____ Aliquots: _____

Samplers: Hudson

COMMENTS OF FIELD PERSONNEL

Site Description:

upgradient well

APPENDIX D

Grimes Property
Well Log Information

Grimes Well Information

Driller:

Hopson Drilling Company
Route #1, Box 288
Hamilton, Illinois 62341
(217) 847-3846

Well Log:

300 ft. Drilling
0-41 Yellow clay
41-78 Sand
78-92 Blue clay
92-110 Sand
110-117 Blue clay
117-120 Rock
120-131 Rock, clay, shale
131-298 Limestone
298-300 Shale

1.5 GPM on bottom
117' 6" steel casing
40' 4.5" PVC, top at 100 ft.
5" hole from 140' to 300'

APPENDIX E

Analytical Results
Previous Well Sampling

CORY LABORATORIES, INC.
823 5th St.
MENOMINEE, MICH.

P.O. No: _____

SAMPLE ANALYSIS SUMMARY

SAMPLE DESCRIPTION:

201-4-1009: #1 Grimes Taken 10-9-80
201-5-1009: #2 Gorham Taken 10-9-80
201-6-1009: #3 Bill Kite Taken 10-9-80

TEST RUN	4-1009	5-1009	6-1009		
Arsenic, mg/l	<0.005	<0.005	<0.005		
Barium, mg/l	<0.5	<0.5	<0.5		
Total Chrome, mg/l	<0.025	<0.025	<0.025		
Lead, mg/l	<0.020	0.039	<0.020		
Mercury, mg/l	<0.0005	<0.0005	<0.0005		
Selenium, mg/l	<0.025	<0.025	<0.025		
Silver, mg/l	<0.030	<0.030	<0.030		
Cadmium, mg/l	<0.020	<0.020	<0.020		
Nitrate Nitrogen, mg/l	0.02	20	0.07		
Kjeldahl Nitrogen, mg/l	0.24	1.6	6.3		
Total Organic Carbon, mg/l	5	15	36		
Phenol, mg/l	0.011	0.023	0.012		

COMMENTS:

Sample Received: 10-23-80DATE: DEC 18 1980ANALYST: Edward W. Burt

APPENDIX F

Addresses of Property Owners