



UCAR CARBON COMPANY INC. P.O. BOX 513, COLUMBIA, TENNESSEE 38402-0513

December 18, 1990

Mr. Robert J. Mitrey  
Associate Sanitary Engineer  
New York State Department of Environmental Conservation  
600 Delaware Ave.  
Buffalo, New York 14202-1073

Re: Quarterly Report of Groundwater Analysis  
- Republic Solid Waste Management Facility  
Post-closure Monitoring Program

Dear Mr. Mitrey:

I am enclosing a copy of the tenth quarter's groundwater sampling analysis from the closed Republic Solid Waste Management Facility. Bedrock well, BW-4, continues to demonstrate some slight semi-volatile and volatile organic contamination in the less than one part per million range.

The following will summarize the current groundwater data from BW-4:

<u>Contaminate</u>	<u>Mean Conc. ppb</u>	<u>Range ppb</u>	<u>10th Qtr. ppb</u>
Hexachlorobutadine	45	10-150	85
Trichloroethylene	371	30-740	400
Vinyl Chloride	80	29-250	43
Chloroform	6.7	5.5-9.2	9.2
Tetrachloroethylene	323	290-380	380
1,1,2,2-Tetrachloroethylene	889	44-1600	0

We do not feel that this contamination at BW-4-86 is related to the Republic Waste Management Facility.

If you have further questions or concerns about this data, please contact me at 615-380-4215.

Very truly yours,

*R.A. Bolton*

R.A. Bolton, Manager  
HS&EA

RAB:nr

Enclosure

cc: Mr Jim Devald, Sr. Public Health Engineer  
Niagara County Health Department

Mr. Dave O'Tool, New York Department of Environmental Conservation

Mr. A.C. Ogg

*logged on nb 8/15/91  
file in box  
Union Carbide  
mm  
well 2*



REPUBLIC SOLID WASTE MANAGEMENT FACILITY POST CLOSURE  
MONITORING PROGRAM  
QUARTERLY REPORT

Report Prepared For

UNION CARBIDE CORPORATION  
CARBON PRODUCTS DIVISION

A handwritten signature in cursive script that reads "Dawn T. Marasco".

Dawn T. Marasco  
Customer Service Representative

A handwritten signature in cursive script that reads "Paul T. McMahon".

Paul T. McMahon  
Quality Control Officer

October 12, 1990  
AES Report CTC

COMMITMENT  
TO  
HONESTY - QUALITY - SERVICE

ADVANCED ENVIRONMENTAL SERVICES, INC.

FIELD REPORT

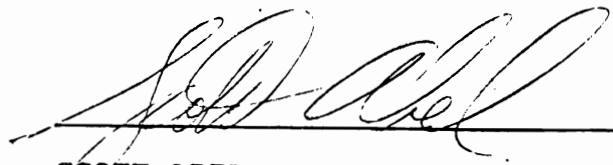
CLIENT: UNION CARBIDE AES JOB CODE: CTC

DATE PURGED: \*\* DATE SAMPLED: \*\*

WELL IDENTIFICATION	TOP OF PIPE ELEVATION	ELEVATION BEFORE PURGING	AMOUNT PURGED	ELEVATION BEFORE SAMPLING
/B-W-1	601.72	582.22	24.0 gal.	582.11
*M-W-1	609.43	595.48	1.5 gal.	575.14
/B-W-2	608.43	591.38	18.0 gal.	591.28
*MW-2	607.54	586.20	2.1 gal.	583.79
/B-W-3	604.72	588.85	16.0 gal.	588.84
*M-W-3	601.61	587.31	2.5 gal.	585.86
/B-W-4	607.08	591.66	13.5 gal.	591.18
/B-W-5	603.33	588.77	27.0 gal.	588.77
/B-W-6	607.04	589.46	24.0 gal.	587.09
O-W-1 South	608.81	600.21	N/A	N/A
O-W-2 North	607.06	597.56	N/A	N/A

\* - Well Purged to Dryness

\*\* - For Purging and Sampling Dates See Table 1

  
SCOTT ABEL

SENIOR FIELD TECHNICIAN

TABLE I

CTC - UNION CARBIDE

9/21/90

<u>Well No</u>	<u>Date Purged</u>	<u>Date Sampled</u>
B-W-1 -	9-21-90	9-21-90
M-W-1 -	9-18-90	9-20-90/9-21-90
B-W-2 -	9-19-90	9-19-90
M-W-2 -	9-19-90	9-20-90/9-21-90
B-W-3 -	9-21-90	9-21-90
M -W-3 -	9-18-90	9-20-90
B-W-4 -	9-18-90	9-18-90
B-W-5 -	9-18-90	9-18-90
B-W-6 -	9-19-90	9-20-90

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

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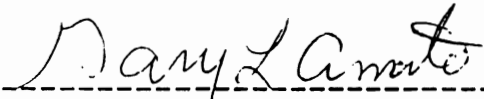
Type of Analysis: INORGANICS

Client: UNION CARBIDE                      A.E.S. JOB CODE CTC

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Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No. -	9003	9004	9005
			Sample ID -	BW-5	BW-4	BLIND
			Sample Date-	GRAB 09/18/90	GRAB 09/18/90	DUP(BW-4) GRAB 09/18/90
Ammonia (as N) (mg/l)	350.1	0.02		0.22	6.05	6.72
Nitrite (mg/l)	353.2	0.01		BQL *	BQL	BQL
Total Kjeldahl Nitrogen(mg/l)	351.2	0.1		0.7	6.4	6.8

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\* Below Quantifiable Limit.

  
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Gary L. Amato  
Technical Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: INORGANICS

Client: UNION CARBIDE

A.E.S. JOB CODE CTC


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AES Lab No. - 9032  
Sample ID - B-W-2

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB
Ammonia (as N) (mg/l)	350.1	0.02	09/19/90	1.45
Total Kjeldahl Nitrogen(mg/l)	351.2	0.1		1.4
Nitrite (mg/l)	353.2	0.01		BQL *

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\* Below Quantifiable Limit.

  
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Gary L. Amato  
Technical Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: INORGANICS

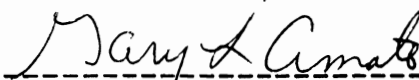
Client: UNION CARBIDE

A.E.S. JOB CODE CTC

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	AES Lab No. -	9069	9071	9072
	Sample ID -	MW-1	MW-3	BW-6
		GRAB	GRAB	GRAB
Analytical Parameter(s)	Method No. Quant. Limits	Sample Date- 09/20/90	09/20/90	09/20/90
Ammonia (as N) (mg/l)	350.1 0.02	NR *	0.10	0.30
Nitrite (mg/l)	353.2 0.01	0.04	BQL **	BQL
Total Kjeldahl Nitrogen(mg/l)	351.2 0.1	NR	0.1	0.4

\* Not Requested.  
\*\* Below Quantifiable Limit.

  
-----  
Gary L. Amato  
Technical Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - ACCURACY

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Type of Analysis: Matrix Spikes and E.P.A. Standards  
Client: UNION CARBIDE                      A.E.S. Job Code: CTC

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(Units:mg/l or ppm)

Analytical Parameters	Sample No.	Type	Observed Conc.	Original Conc.	Added Conc.	Percent Recovery*
Nitrite	9072	SPK	0.258	BQL * *	0.250	103
Total Kjedadhl Nitrogen	9072	SPK	5.8	0.4	5.0	108
Total Kjedadhl Nitrogen	---	EPA	5.6	5.0	---	112
Ammonia	---	INDSTD	51.2	50.0	---	102
Ammonia	9072	SPK	0.82	0.30	0.50	104

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\* % Recovery=100 x ((Observed Conc. - "background" Original Conc.)/"Spike" Added Conc.)

\* Below Quantifiable Limit.



ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis  
Units of Analysis: Milligrams/Liter or ppm  
Client: UNION CARBIDE      A.E.S. Job Code:CTC

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Analytical Parameters	Sample No.	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
Nitrite	9072	BQL *	BQL	BQL	NA **	NA
Total Kjeldahl Nitrogen	9072	0.4	0.4	0.4	0	0
Ammonia	9072	0.29	0.30	0.30	0.01	3.3

Relative Percent Difference =  
Range/Average X 100

\* Below Quantifiable Limit.

\*\* Not Available.

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====


Type of Analysis: INORGANICS

Client: UNION CARBIDE

A.E.S. JOB CODE CTC

			AES Lab No. -	9108	9109	9110	9111
			Sample ID -	MW-1	MW-2	BW-3	BW-1
			Sample Date-	09/21/90	09/21/90	09/21/90	09/21/90
Analytical Parameter(s)	Method No.	Quant. Limits		GRAB	GRAB	GRAB	GRAB
Ammonia (mg/l)	350.1	0.02		9.12	NR * ?	0.85	0.32
Total Kjeldhal Nitrogen(mg/l)	351.2	0.1		10	NR	0.9	0.5
Nitrite	353.2	0.01		NR	0.02	BQL **	BQL

\* Not Requested.  
\*\* Below Quantifiable Limit.

  
-----  
Gary L. Amato  
Technical Supervisor

JOB CODE: CTC

**Signature**

**Sample #**

## Method

### Analysis

Signature .  
Daryl Amato

9003-05

353.2

9-19-90

T. Spini

9003-05

35-1.2

9-25-94

7. *Sho*

9003.05

350.1

9-26-92

JOB CODE: CTE

*[Signature]*

T. Sp.

9032

9032

9032

353.2

351.2

350.1

9-20-90

9-25-

9-26-90

JOB CODE: CTC

**JOB CODE:**

CTC

[illegible]

JOB CODE: CTC

Date of Analysis

9-22-90

9-25

9-26-

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====  
Type of Analysis: INORGANICS

Client: UNION CARBIDE

A.E.S. Job Code CTC

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(All results are in mg/l)

Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No. - Sample ID -			
			Sample Date-	09/18/90	09/18/90	09/18/90
				9003 BW-5 GRAB	9004 BW-4 GRAB	9005 BLIND DUP GRAB (BW-4)
Total Iron (Fe)	236.1	0.30		11.0	46.6	32.8
Soluble Iron (Fe)	236.1	0.30		0.95	2.65	1.84
Total Potassium (K)	258.1	1.00		4.48	32.0	31.8
Soluble Potassium (K)	258.1	1.00		4.32	31.8	31.6
Total Zinc (Zn)	289.1	0.05		2.80	4.20	4.20
Soluble Zinc (Zn)	289.1	0.05		0.16	0.43	0.42

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*Gary L. Amato*  
Gary L. Amato  
Technical Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

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Type of Analysis: INORGANICS

Client: UNION CARBIDE

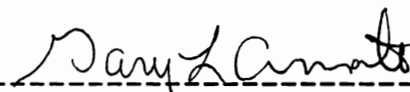
A.E.S. Job Code CTC

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(All results are in mg/l)

AES Lab No. - 9032  
Sample ID - B-W-2

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB
Total Iron (Fe)	236.1	0.30	09/19/90	7.32
Soluble Iron (Fe)	236.1	0.30		2.41
Total Potassium (K)	258.1	1.00		9.74
Soluble Potassium (K)	258.1	1.00		9.44
Total Zinc (Zn)	289.1	0.05		17.8
Soluble Zinc (Zn)	289.1	0.05		0.59

  
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Gary L. Amato  
Technical Supervisor



ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: INORGANICS

Client: UNION CARBIDE

A.E.S. Job Code CTC

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(All results are in mg/l)

			AES Lab No. -	9069	9070	9071	9072
			Sample ID -	MW-1	MW-2	MW-3	BW-6
				GRAB	GRAB	GRAB	GRAB
Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	09/20/90	09/20/90	09/20/90	09/20/90
Total Iron (Fe)	236.1	0.30		20.5	418	29.0	80.2
Soluble Iron (Fe)	236.1	0.30		0.38	0.64	0.80	4.52
Total Potassium (K)	258.1	1.00		54.8	10.6	10.3	27.7
Soluble Potassium (K)	258.1	1.00		50.1	9.18	1.94	14.0
Total Zinc (Zn)	289.1	0.05		2.13	4.05	0.33	0.34
Soluble Zinc (Zn)	289.1	0.05		0.07	0.09	0.11	0.26



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Gary L. Amato  
Technical Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION  
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Type of Analysis: Duplicate Analysis  
Units of Analysis: Milligrams/Liter, or ppm  
Client: UNION CARBIDE A.E.S. Job Code:CTC  
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Analytical Parameters	Sample No.	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
Total Iron	9072	80.2	80.2	80.2	0	0
Soluble Iron	9072	4.55	4.48	4.52	0.07	1.5
Total Potassium	9072	27.7	27.7	27.7	0	0
Soluble Potassium	9072	14.0	14.1	14.0	0.1	0.7
Total Zinc	9072	0.35	0.33	0.34	0.02	5.9
Soluble Zinc	9072	0.25	0.26	0.26	0.01	3.8

Relative Percent Difference =  
Range/Average X 100

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - ACCURACY

=====  
Type of Analysis: Matrix Spikes and E.P.A. Standards  
Client: UNION CARBIDE A.E.S. Job Code: CTC  
=====

(Units:mg/l or ppm)

Analytical Parameters	Sample No.	Type	Observed Conc.	Original Conc.	Added Conc.	Percent Recovery*
Total Iron	9072	SPK *	8.88	4.01	5.00	97
Soluble Iron	9072	SPK	9.02	4.52	5.00	90
EPA (Fe) Std.	988	EPA	1.02	1.00	---	102
Total Potassium	9072	SPK *	33.4	13.8	20.0	98
Soluble Potassium	9072	SPK	34.0	14.0	20.0	100
IND (K) Std.	---	STD	10.4	10.0	---	104
Total Zinc	9072	SPK	1.34	0.34	1.00	100
Soluble Zinc	9072	SPK	1.28	0.26	1.00	102
EPA (Zn) Std.	989	EPA	0.46	0.50	---	92

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\* % Recovery=100 x ((Observed Conc. - "background" Original Conc.)/"Spike" Added Conc.)

\* Spike performed on a sample dilution.

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
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Type of Analysis: INORGANICS

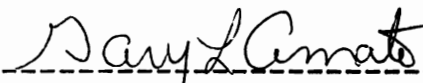
Client: UNION CARBIDE

A.E.S. Job Code CTC

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(All results are in mg/l)

AES Lab No. - 9110 9111  
Sample ID - BW 3 BW 1

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB 09/21/90	GRAB 09/21/90
Total Iron (Fe)	236.1	0.30		3.35	4.03
Soluble Iron (Fe)	236.1	0.30		1.03	1.62
Total Potassium (K)	258.1	1.00		6.13	3.51
Soluble Potassium (K)	258.1	1.00		5.67	3.47
Total Zinc (Zn)	289.1	0.05		12.2	0.80
Soluble Zinc (Zn)	289.1	0.05		0.76	0.34

  
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Gary L. Amato  
Technical Supervisor

AES INORGANIC DEPARTMENT TRACEABILITY.

JOB CODE: GTC

[illegible]

AES INORGANIC DEPARTMENT TRACEABILITY  
JOB CODE: CTC

JOB CODE: CTC

[illegible]

**JOB CODE:**

CTC

Mark Moore

Mark Morris

Mack Morris

9069-12T, S

11

2

236.

289-1

258.

9-25-90

9-25-90

9-27-90

CTC

Mack Moren  
Mack Moren  
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$$\begin{array}{r} \underline{9110} \text{ (T+S)} \\ \underline{9111} \text{ (T+S)} \\ 9110 - 9111 \text{ T/S} \\ \underline{\phantom{9110 - 9111} \text{ T/S}} \end{array}$$

236.1  
236.1  
289.1  
258.1

9-26-90  
9-26-90  
9-26-90  
9-27-90



ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

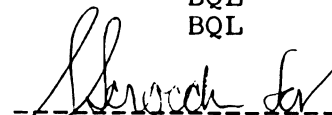
=====  
Type of Analysis: VOLATILES

Units of Measure: Micrograms/ liter or ppb

Client: UNION CARBIDE A.E.S. Job Code CTC

Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No.- 9002		9004		9005	
			Sample ID - TRIP BLANK		BW-4		BLIND DUP	
			GRAB		GRAB		GRAB	
			Sample Date-		09/18/90		09/18/90	
Chloromethane	8240	10	BQL *		BQL		BQL	
- Vinyl Chloride	"	"	BQL		43		53	
Chloroethane	"	"	BQL		BQL		BQL	
Bromomethane	"	"	BQL		BQL		BQL	
2-Chloroethylvinylether	"	"	BQL		BQL		BQL	
Ethylbenzene	"	5.0	BQL		BQL		BQL	
Methylene Chloride	"	"	BQL		BQL		BQL	
Chlorobenzene	"	"	BQL		BQL		BQL	
1,1-Dichloroethylene	"	"	BQL		BQL		BQL	
1,1-Dichloroethane	"	"	BQL		BQL		BQL	
trans-1,2-Dichloroethylene	"	"	BQL		BQL		BQL	
- Chloroform	"	"	BQL		9.2		8.9	
1,2-Dichloroethane	"	"	BQL		BQL		BQL	
1,1,1-Trichloroethane	"	"	BQL		BQL		BQL	
Carbon Tetrachloride	"	"	BQL		BQL		BQL	
Bromodichloromethane	"	"	BQL		BQL		BQL	
1,2-Dichloropropene	"	"	BQL		BQL		BQL	
trans-1,3-Dichloropropene	"	"	BQL		BQL		BQL	
- Trichloroethylene	"	"	BQL		400		380	
Benzene	"	"	BQL		BQL		BQL	
cis-1,3-Dichloropropene	"	"	BQL		BQL		BQL	
1,1,2-Trichloroethane	"	"	BQL		BQL		BQL	
Dibromochloromethane	"	"	BQL		BQL		BQL	
Bromoform	"	"	BQL		BQL		BQL	
- Tetrachloroethylene	"	"	BQL		380		340	
1,1,2,2-Tetrachloroethane	"	"	BQL		BQL		BQL	
Toluene	"	"	BQL		BQL		BQL	

\* Below Quantifiable Limits

  
Wayne J. Juda  
Organics Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC

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Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No.- 9002			9004		9005			
			Sample ID - TRIP BLANK			BW-4		BLIND DUP			
								(BW-4)			
			Sample Date-			GRAB		GRAB			
						09/18/90		09/18/90			
Acetone	8240	50			BQL *		BQL		BQL		
Carbon Disulfide	"	5.0			BQL		BQL		BQL		
2-Butanone	"	50			BQL		BQL		BQL		
Vinyl Acetate	"	50			BQL		BQL		BQL		
2-Hexanone	"	50			BQL		BQL		BQL		
4-Methyl-2-Pentanone	"	50			BQL		BQL		BQL		
Styrene	"	5.0			BQL		BQL		BQL		
o-Xylene	"	5.0			BQL		BQL		BQL		
m/p-Xylene	"	5.0			BQL		BQL		BQL		

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*Shirach fr*

Wayne J. Juda  
Organics Supervisor

\* Below Quantifiable Limits

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

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Type of Analysis: VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC

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AES Lab No.- 9072  
Sample ID - BW-6

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB 09/20/90
Chloromethane	8240	10		BQL *
Vinyl Chloride	"	"		BQL
Chloroethane	"	"		BQL
Bromomethane	"	"		BQL
2-Chloroethylvinylether	"	"		BQL
Ethylbenzene	"	5.0		BQL
Methylene Chloride	"	"		BQL
Chlorobenzene	"	"		BQL
1,1-Dichloroethylene	"	"		BQL
1,1-Dichloroethane	"	"		BQL
trans-1,2-Dichloroethylene	"	"		BQL
Chloroform	"	"		BQL
1,2-Dichloroethane	"	"		BQL
1,1,1-Trichloroethane	"	"		BQL
Carbon Tetrachloride	"	"		BQL
Bromodichloromethane	"	"		BQL
1,2-Dichloropropene	"	"		BQL
trans-1,3-Dichloropropene	"	"		BQL
Trichloroethylene	"	"		BQL
Benzene	"	"		BQL
cis-1,3-Dichloropropene	"	"		BQL
1,1,2-Trichloroethane	"	"		BQL
Dibromochloromethane	"	"		BQL
Bromoform	"	"		BQL
Tetrachloroethylene	"	"		BQL
1,1,2,2-Tetrachloroethane	"	"		BQL
Toluene	"	"		BQL

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*Wayne J. Juda*  
Wayne J. Juda  
Organics Supervisor

\* Below Quantifiable Limits

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: VOLATILES

Units of Measure: Micrograms/ liter or ppb


Client: UNION CARBIDE A.E.S. Job Code CTC

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AES Lab No.- 9072  
Sample ID - BW-6

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB 09/20/90
Acetone	8240	50		BQL *
Carbon Disulfide	"	5.0		BQL
2-Butanone	"	50		BQL
Vinyl Acetate	"	50		BQL
2-Hexanone	"	50		BQL
4-Methyl-2-Pentanone	"	50		BQL
Styrene	"	5.0		BQL
o-Xylene	"	5.0		BQL
m/p-Xylene	"	5.0		BQL

\* Below Quantifiable Limits

  
-----  
Wayne J. Juda  
Organics Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

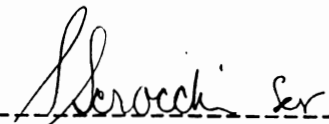
Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb

Client: UNION CARBIDE A.E.S. Job Code CTC

			AES Lab No.- 9002		9004	9005
			Sample ID - TRIP BLANK		BW-4	BLIND DUP
						(BW-4)
			GRAB		GRAB	GRAB
Analytical	Method	Quant.	Sample Date-	09/18/90	09/18/90	09/18/90
Parameter(s)	No.	Limits				
N-Nitrosodimethylamine	8270	10		BQL *	BQL	BQL
Bis(2-Chloroethyl) Ether	"	"		BQL	BQL	BQL
1,3-Dichlorobenzene	"	"		BQL	BQL	BQL
1,4-Dichlorobenzene	"	"		BQL	BQL	BQL
1,2-Dichlorobenzene	"	"		BQL	BQL	BQL
Bis(2-Chloroisopropyl)	"	"		BQL	BQL	BQL
Ether						
Hexachloroethane	"	"		BQL	BQL	BQL
N-Nitrosodi-N-Propylamine	"	"		BQL	BQL	BQL
Nitrobenzene	"	"		BQL	BQL	BQL
Isophorone	"	"		BQL	BQL	BQL
Bis(2-Chloroethoxy) Methane	"	"		BQL	BQL	BQL
1,2,4-Trichlorobenzene	"	"		BQL	BQL	BQL
Naphthalene	"	"		BQL	BQL	BQL
Hexachlorobutadiene	"	"		BQL	85	62
Hexachlorocyclopentadiene	"	"		BQL	BQL	BQL
2-Chloronaphthalene	"	"		BQL	BQL	BQL
Dimethylphthalate	"	"		BQL	BQL	BQL
Acenaphthylene	"	"		BQL	BQL	BQL
2,6-Dinitrotoluene	"	"		BQL	BQL	BQL
Acenaphthene	"	"		BQL	BQL	BQL
2,4-Dinitrotoluene	"	"		BQL	BQL	BQL
Diethylphthalate	"	"		BQL	BQL	BQL

\* Below Quantifiable Limits

  
Wayne J. Juda  
Organics Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====

Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC

-----

Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No.- 9002 9004 9005			
			Sample ID - TRIP BLANK BW-4 BLIND DUP			
			(BW-4)			
			GRAB GRAB GRAB			
			Sample Date- 09/18/90 09/18/90 09/18/90			
Fluorene	8270	10	BQL *	BQL	BQL	BQL
4-Chlorophenylphenylether	"	"	BQL	BQL	BQL	BQL
N-Nitrosodiphenylamine	"	"	BQL	BQL	BQL	BQL
1,2-Diphenylhydrazine	"	"	BQL	BQL	BQL	BQL
4-Bromophenylphenylether	"	"	BQL	BQL	BQL	BQL
Hexachlorobenzene	"	"	BQL	BQL	BQL	BQL
Phenanthrene	"	"	BQL	BQL	BQL	BQL
Anthracene	"	"	BQL	BQL	BQL	BQL
Di-N-Butylphthalate	"	"	BQL	BQL	BQL	BQL
Fluoranthene	"	"	BQL	BQL	BQL	BQL
Benzidine	"	30	BQL	BQL	BQL	BQL
Pyrene	"	10	BQL	BQL	BQL	BQL
Butylbenzylphthalate	"	"	BQL	BQL	BQL	BQL
Benzo(a)Anthracene	"	"	BQL	BQL	BQL	BQL
3,3'-Dichlorobenzidine	"	20	BQL	BQL	BQL	BQL
Chrysene	"	10	BQL	BQL	BQL	BQL
Bis(2-Ethylhexyl) Phthalate	"	20	BQL	BQL	BQL	BQL
Di-N-Octylphthalate	"	10	BQL	BQL	BQL	BQL
Benzo(b) Fluoranthene	"	"	BQL	BQL	BQL	BQL
Benzo(k) Fluoranthene	"	"	BQL	BQL	BQL	BQL
Benzo(a) Pyrene	"	"	BQL	BQL	BQL	BQL
Indeno(1,2,3-cd) Pyrene	"	"	BQL	BQL	BQL	BQL
Dibenz(a,h) Anthracene	"	"	BQL	BQL	BQL	BQL
Benzo(g,h,i) Perylene	"	"	BQL	BQL	BQL	BQL

-----

*Wayne J. Juda*

Wayne J. Juda  
Organics Supervisor

\* Below Quantifiable Limits


ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====  
Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC  
-----

Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No.- Sample ID - TRIP	9002 BLANK	9004 BW-4	9005 BLIND DUP (BW-4)
			Sample Date-	GRAB 09/18/90	GRAB 09/18/90	GRAB 09/18/90
Phenol	8270	10		BQL *	BQL	BQL
2-Chlorophenol	"	"		BQL	BQL	BQL
2-Nitrophenol	"	"		BQL	BQL	BQL
2,4-Dimethylphenol	"	"		BQL	BQL	BQL
4-Chloro-3-Methylphenol	"	20		BQL	BQL	BQL
2,4,6-Trichlorophenol	"	10		BQL	BQL	BQL
2,4-Dinitrophenol	"	50		BQL	BQL	BQL
4-Nitrophenol	"	"		BQL	BQL	BQL
4,6-Dinitro-2-Methylphenol	"	"		BQL	BQL	BQL
Pentachlorophenol	"	"		BQL	BQL	BQL
2,4-Dichlorophenol	"	10		BQL	BQL	BQL
4-Methylphenol	"	"		BQL	BQL	BQL
Benzoic Acid	"	50		BQL	BQL	BQL
2,4,5-Trichlorophenol	"	10		BQL	BQL	BQL
3-Nitroaniline	"	50		BQL	BQL	BQL
Dibenzofuran	"	10		BQL	BQL	BQL
4-Nitroaniline	"	50		BQL	BQL	BQL
2-Methylphenol	"	10		BQL	BQL	BQL
2-Methylnaphthalene	"	"		BQL	BQL	BQL
Aniline	"	"		BQL	BQL	BQL
Benzyl Alcohol	"	20		BQL	BQL	BQL
4-Chloroaniline	"	"		BQL	BQL	BQL
2-Nitroaniline	"	50		BQL	BQL	BQL

\* Below Quantifiable Limits

-----  
  
Wayne J. Juda  
Organics Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

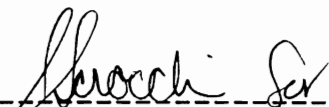
=====  
Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC  
-----

AES Lab No.- 9072  
Sample ID - BW-6

Analytical Parameter(s)	Method No.	Quant. Limits	Sample Date-	GRAB 09/20/90
Fluorene	8270	10		BQL *
4-Chlorophenylphenylether	"	"		BQL
N-Nitrosodiphenylamine	"	"		BQL
1,2-Diphenylhydrazine	"	"		BQL
4-Bromophenylphenylether	"	"		BQL
Hexachlorobenzene	"	"		BQL
Phenanthrene	"	"		BQL
Anthracene	"	"		BQL
Di-N-Butylphthalate	"	"		BQL
Fluoranthene	"	"		BQL
Benzidine	"	30		BQL
Pyrene	"	10		BQL
Butylbenzylphthalate	"	"		BQL
Benzo(a)Anthracene	"	"		BQL
3,3'-Dichlorobenzidine	"	20		BQL
Chrysene	"	10		BQL
Bis(2-Ethylhexyl) Phthalate	"	20		BQL
Di-N-Octylphthalate	"	10		BQL
Benzo(b) Fluoranthene	"	"		BQL
Benzo(k) Fluoranthene	"	"		BQL
Benzo(a) Pyrene	"	"		BQL
Indeno(1,2,3-cd) Pyrene	"	"		BQL
Dibenz(a,h) Anthracene	"	"		BQL
Benzo(g,h,i) Perylene	"	"		BQL

\* Below Quantifiable Limits

  
-----  
Wayne J. Juda  
Organics Supervisor



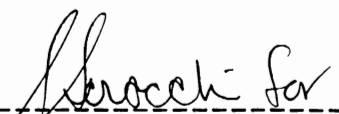
ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====  
Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC  
-----

	AES Lab No.-	9072
	Sample ID -	BW-6
Analytical	Method	Quant.
Parameter(s)	No.	Limits
	Sample Date-	GRAB
	09/20/90	
N-Nitrosodimethylamine	8270	10
Bis(2-Chloroethyl) Ether	"	"
1,3-Dichlorobenzene	"	"
1,4-Dichlorobenzene	"	"
1,2-Dichlorobenzene	"	"
Bis(2-Chloroisopropyl) Ether	"	"
Hexachloroethane	"	"
N-Nitrosodi-N-Propylamine	"	"
Nitrobenzene	"	"
Isophorone	"	"
Bis(2-Chloroethoxy) Methane	"	"
1,2,4-Trichlorobenzene	"	"
Naphthalene	"	"
Hexachlorobutadiene	"	"
Hexachlorocyclopentadiene	"	"
2-Chloronaphthalene	"	"
Dimethylphthalate	"	"
Acenaphthylene	"	"
2,6-Dinitrotoluene	"	"
Acenaphthene	"	"
2,4-Dinitrotoluene	"	"
Diethylphthalate	"	"

BQL \*  
BQL  
BQL  
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Wayne J. Juda  
Organics Supervisor

\* Below Quantifiable Limits

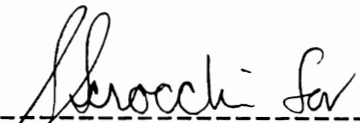
ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT

=====  
Type of Analysis: SEMI-VOLATILES

Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE A.E.S. Job Code CTC  
-----

	AES Lab No.-	9072
	Sample ID -	BW-6
-----		
Analytical	Method	Quant.
Parameter(s)	No.	Limits
	Sample Date-	GRAB
	09/20/90	
-----		
Phenol	8270	10
2-Chlorophenol	"	"
2-Nitrophenol	"	"
2,4-Dimethylphenol	"	"
4-Chloro-3-Methylphenol	"	20
2,4,6-Trichlorophenol	"	10
2,4-Dinitrophenol	"	50
4-Nitrophenol	"	"
4,6-Dinitro-2-Methylphenol	"	"
Pentachlorophenol	"	"
2,4-Dichlorophenol	"	10
4-Methylphenol	"	"
Benzoic Acid	"	50
Dibenzofuran	"	10
4-Nitroaniline	"	50
2-Methylphenol	"	10
2-Methylnaphthalene	"	"
Aniline	"	"
Benzyl Alcohol	"	20
4-Chloroaniline	"	"
2-Nitroaniline	"	50
2,4,5 - Trichlorophenol	"	10
3 - Nitroaniline	"	50

\* Below Quantifiable Limits

  
-----  
Wayne J. Juda  
Organics Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis  
Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE      A.E.S. Job Code:CTC

-----

Analytical Parameters	Sample Code	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
Chloromethane	9072	<10	<10	<10	NONE	NONE
Vinyl Chloride	"	"	"	"	"	"
Chloroethane	"	"	"	"	"	"
Bromomethane	"	"	"	"	"	"
2-Chloroethylvinylether	"	"	"	"	"	"
Ethylbenzene	"	<5.0	<5.0	<5.0	NONE	NONE
Methylene Chloride	"	"	"	"	"	"
Chlorobenzene	"	"	"	"	"	"
1,1-Dichloroethylene	"	"	"	"	"	"
1,1-Dichloroethane	"	"	"	"	"	"
trans-1,2-Dichloroethylene	"	"	"	"	"	"
Chloroform	"	"	"	"	"	"
1,2-Dichloroethane	"	"	"	"	"	"
1,1,1-Trichloroethane	"	"	"	"	"	"
Carbon Tetrachloride	"	"	"	"	"	"
Bromodichloromethane	"	"	"	"	"	"
1,2-Dichloropropane	"	"	"	"	"	"
trans-1,3-Dichloropropene	"	"	"	"	"	"
Trichloroethylene	"	"	"	"	"	"
Benzene	"	"	"	"	"	"
cis-1,3-Dichloropropene	"	"	"	"	"	"
1,1,2-Trichloroethane	"	"	"	"	"	"
Dibromochloromethane	"	"	"	"	"	"
Bromoform	"	"	"	"	"	"
Tetrachloroethylene	"	"	"	"	"	"

Relative Percent Difference =  
Range/Average X 100

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis  
Units of Measure: Micrograms/ liter or ppb  
Client: UNION CARBIDE                      A.E.S. Job Code:CTC

-----

Analytical Parameters	Sample Code	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
1,1,2,2-Tetrachloroethane	9072	<5.0	<5.0	<5.0	NONE	NONE
Toluene	"	"	"	"	"	"
Acetone	"	<50	<50	<50	"	"
Carbon Disulfide	"	<5.0	<5.0	<5.0	"	"
2-Butanone	"	<50	<50	<50	"	"
Vinyl Acetate	"	"	"	"	"	"
2-Hexanone	"	"	"	"	"	"
4-Methyl-2-Pentanone	"	"	"	"	"	"
Styrene	"	<5.0	<5.0	<5.0	"	"
O-Xylene	"	"	"	"	"	"
M/P-Xylene	"	"	"	"	"	"

Relative Percent Difference =  
Range/Average X 100

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis  
Units of Measure: Microgram/Liter, or ppb  
Client: UNION CARBIDE A.E.S. Job Code:CTC

-----

Analytical Parameters	Sample Code	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
N-Nitrosodimethylamine	9072	<10	<10	<10	NONE	NONE
Bis(2-Chloroethyl) Ether	"	"	"	"	"	"
1,3-Dichlorobenzene	"	"	"	"	"	"
1,4-Dichlorobenzene	"	"	"	"	"	"
1,2-Dichlorobenzene	"	"	"	"	"	"
Bis(2-Chloroisopropyl) Ether	"	"	"	"	"	"
Hexachloroethane	"	"	"	"	"	"
N-Nitrosodi-N-Propylamine	"	"	"	"	"	"
Nitrobenzene	"	"	"	"	"	"
Isophorone	"	"	"	"	"	"
Bis(2-Chloroethoxy) Methane	"	"	"	"	"	"
1,2,4-Trichlorobenzene	"	"	"	"	"	"
Naphthalene	"	"	"	"	"	"
Hexachlorobutadiene	"	"	"	"	"	"
Hexachlorocyclopentadiene	"	"	"	"	"	"
2-Chloronaphthalene	"	"	"	"	"	"
Dimethylphthalate	"	"	"	"	"	"
Acenaphthylene	"	"	"	"	"	"
2,6-Dinitrotoluene	"	"	"	"	"	"
Acenaphthene	"	"	"	"	"	"
2,4-Dinitrotoluene	"	"	"	"	"	"
Diethylphthalate	"	"	"	"	"	"
Fluorene	"	"	"	"	"	"
4-Chlorophenyl Phenyl Ether	"	"	"	"	"	"
N-Nitrosodiphenylamine	"	"	"	"	"	"

Relative Percent Difference =  
Range/Average X 100

## ADVANCED ENVIRONMENTAL SERVICES, INC.

## LABORATORY REPORT

## QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis

Units of Measure: Microgram/Liter, or ppb

Client: Union Carbide A.E.S. Job Code:CTC

-----

Analytical Parameters	Sample Code	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
1,2-Diphenylhydrazine	9072	<10	<10	<10	NONE	NONE
4-Bromophenylphenylether	"	"	"	"	"	"
Hexachlorobenzene	"	"	"	"	"	"
Phenanthrene	"	"	"	"	"	"
Anthracene	"	"	"	"	"	"
Di-N-Butylphthalate	"	"	"	"	"	"
Flouranthene	"	"	"	"	"	"
Benzidine	"	<50	<50	<50	"	"
Pyrene	"	<10	<10	<10	"	"
Butylbenzylphthalate	"	"	"	"	"	"
Benzo(a)Anthracene	"	"	"	"	"	"
3,3'-Dichlorobenzidine	"	<30	<30	>30	"	"
Chrysene	"	<10	<10	<10	"	"
Bis(2-Ethylhexyl)Phthalate	"	<20	<20	<20	"	"
Di-N-Octylphthalate	"	<10	<10	<10	"	"
Benzo(b)Fluoranthene	"	"	"	"	"	"
Benzo(k)Fluoranthene	"	"	"	"	"	"
Benzo(a)Pyrene	"	"	"	"	"	"
Indeno(1,2,3-cd)Pyrene	"	"	"	"	"	"
Dibenz(a,h)Anthracene	"	"	"	"	"	"
Benzo(g,h,i)Perylene	"	"	"	"	"	"
Phenol	"	"	"	"	"	"
2-Chlorophenol	"	"	"	"	"	"
2-Nitrophenol	"	"	"	"	"	"
2,4-Dimethylphenol	"	"	"	"	"	"

Relative Percent Difference =  
Range/Average X 100

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - PRECISION

=====

Type of Analysis: Duplicate Analysis  
Units of Measure: Microgram/Liter, or ppb  
Client: UNION CARBIDE A.E.S. Job Code:CTC

-----

Analytical Parameters	Sample Code	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
4-Chloro-3-Methylphenol	9072	<20	<20	<20	NONE	NONE
2,4,6-Trichlorophenol	"	<10	<10	<10	"	"
2,4-Dinitrophenol	"	<50	<50	<50	"	"
4-Nitrophenol	"	"	"	"	"	"
4,6-Dinitro-2-Methylphenol	"	"	"	"	"	"
Pentachlorophenol	"	"	"	"	"	"
2,4-Dichlorophenol	"	<10	<10	<10	"	"
4-Methylphenol	"	"	"	"	"	"
2,4,5-Trichlorophenol	"	"	"	"	"	"
2-Methylphenol	"	"	"	"	"	"
Benzoic Acid	"	<50	<50	<50	"	"
Benzyl Alcohol	"	<20	<20	<20	"	"
Aniline	"	<10	<10	<10	"	"
2-Methylnaphthalene	"	"	"	"	"	"
2-Nitroaniline	"	<50	<50	<50	"	"
4-Nitroaniline	"	"	"	"	"	"
3-Nitroaniline	"	"	"	"	"	"
Dibenzofuran	"	<10	<10	<10	"	"
4-Chloroaniline	"	<20	<20	<20	"	"

Relative Percent Difference =  
Range/Average X 100

ADVANCED ENVIRONMENTAL SERVICES, INC.  
LABORATORY REPORT  
QUALITY CONTROL - ACCURACY

Type of Analysis: Matrix Spikes and E.P.A. Standards  
Client: UNION CARBIDE A.E.S. Job Code: CTC

(Units: ug/l, or ppb)

Analytical Parameters	Sample No.	Type	Observed Conc.	Original Conc.	Added Conc.	Percent Recovery*
1,1-Dichloroethene	9072	SPK	18.9	<5.0	20.0	94
trans-1,2-Dichloroethene	"	"	21.1	"	"	106
1,1-Dichloroethane	"	"	20.2	"	"	101
Chloroform	"	"	20.4	"	"	102
Benzene	"	"	22.6	"	"	113
Trichloroethene	"	"	20.4	"	"	107
Toluene	"	"	20.7	"	"	104
Tetrachloroethene	"	"	20.6	"	"	103
Chlorobenzene	"	"	21.2	"	"	106
2-Chlorophenol	"	"	71	<10	100	71
1,3-Dichlorobenzene	"	"	68	"	"	68
N-Nitrosodipropylamine	"	"	71	"	"	71
1,2,4-Trichlorobenzene	"	"	67	"	"	67
4-Chloro-3-Methylphenol	"	"	75	"	"	75
Acenaphthene	"	"	70	"	"	70
2,4-Dinitrotoluene	"	"	68	"	"	68
Pyrene	"	"	111	"	"	111

\* % Recovery =  $100 \times ((\text{Observed Conc.} - \text{"background" Original Conc.}) / \text{"Spike" Added Conc.})$



ORGANIC DEPARTMENT TRACEABILITY  
JOB CODE: CTL

AES  
Sample #

Date of Analysis

Jim Fugh  
Jim Fugh

9002, 9004, 9005

8240

9/20/90

9002, 9004, 9005

8270

9/27/90

ORGANIC DEPARTMENT TRACEABILITY  
JOB CODE: CTC

AES  
Sample #

Date of Analysis

Jim High  
Jim High

9072

8240

9/25/90

9072

8270

9/27/90

APPENDIX A  
CHAIN OF CUSTODY RECORDS



# CHAIN OF CUSTODY RECORD

PROJECT NAME: Union Carbide Wells



SAMPLER'S SIGNATURE: [Signature]

JOB CODE: CTC  
Quarterly

[illegible]

**NOTE: Please indicate required analysis, and whom we may contact with questions, if you have not yet done so through your customer service representative.**

TOTAL NUMBER OF CONTAINERS	22
----------------------------	----

1. RELINQUISHED BY: 	DATE 9/18/90	TIME 3:30 pm	RECEIVED BY:  4:20
2. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____
3. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____





JOB CODE: CTC

Quarterly

**NOTE:** Please indicate required analysis, and whom we may contact with questions, if you have not yet done so through your customer service representative.

TOTAL NUMBER OF CONTAINERS 4

1. RELINQUISHED BY: 	DATE 9/19/90	TIME 4:00 PM	RECEIVED BY: 
2. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____
3. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____





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JOB CODE: CTC

[illegible]

**NOTE: Please indicate required analysis, and whom we may contact with questions, if you have not yet done so through your customer service representative.**

TOTAL NUMBER OF CONTAINERS 10

1. RELINQUISHED BY: 	DATE 9/21/90	TIME 3 <sup>30</sup> pm	RECEIVED BY: 
2. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____
3. RELINQUISHED BY: _____	DATE	TIME	RECEIVED BY: _____