UNION CARBIDE

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

May 4, 1990

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

Dear Mr. Mitrey:

I am enclosing a copy of the eighth quarter's ground water sampling analysis from the closed Republic Solid Waste Management Facility. Bedrock well, BW-4, remains the only well which indicates some slight semi-volatile and volatile organic contamination in the less than one part per million range.

Methylene chloride, acetone and butybenzylpthalate were not found in this particular sampling round.

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

Sampling Date	Contaminate	Concentration ppb
7/88	Hexachlorobutadine	13
3/89	Hexachlorobutadine	150
6/89	Hexachlorobutadine	22
9/89	Hexachlorobutadine	29
12/89	Hexachlorobutadine	10
3/90	Hexachlorobutadine	19
11/88	Teichloroethylene	30
3/89	Teichloroethylene	570
6/89	Teichloroethylene	740
9/89	Teichloroethylene	350
12/89	Teichloroethylene	320
3/90	Teichloroethylene	290
9/89	Vinyl Chloride	34
12/89	Vinyl Chloride	44
3/90	Vinyl Chloride	250
9/89	Chloroform	5.5
12/89	Chloroform	5.5
7/88	1,1,2,2-Tetrachloroethylene	44
11/89	1,1,2,2-Tetrachloroethylene	1300
3/89	1,1,2,2-Tetrachloroethylene	1600
6/89	1,1,2,2-Tetrachloroethylene	1500
9/89	1,1,2,2-Tetrachloroethylene	510
12/89	1,1,2,2-Tetrachloroethylene	380
3/90	Tetrachloroethylene	300

As discussed in previous reports BW-4-86 well is located upgradient of the bulk of the Republic Solid Waste Management Facility fill in regards to the overburden ground water flow direction; therefore, any contamination in the overburden at this location may, in fact, be originating off-site to the north.

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

If you have further questions or concerns about this data, please contact me at 614-380-4215.

Very truly yours,

UCAR CARBON COMPANY, INC.

Rick Bolton

Rick A. Bolton
Manager H.S.&E.A.

RAB/bc

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

ADVANCED
ENVIRONMENTAL SERVICES INC.

REPUBLIC SOLID WASTE MANAGEMENT FACILITY
POST-CLOSURE MONITORING PROGRAM QUARTERLY REPORT
OF GROUNDWATER ANALYSIS

Report Prepared For

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION

Frank J. Scrivano
Project Manager

Paul T. McMahon
Quality Control Officer

April 23, 1990
AES Report CTC

COMMITMENT
TO
HONESTY - QUALITY - SERVICE

ADVANCED ENVIRONMENTAL SERVICES, INC.

FIELD REPORT

CLIENT: UNION CARBIDE AES JOB CODE: CTC

DATE PURGED: 3/28/90 DATE SAMPLED: 3/28/90

WELL IDENTIFICATION	TOP OF PIPE ELEVATION	ELEVATION BEFORE PURGING	AMOUNT PURGED	ELEVATION BEFORE SAMPLING
B-W-1	610.72	596.11	17.0 Gal.	595.81
*** M-W-1	609.43	595.72	2.5 Gal.	588.53
B-W-3	604.72	597.62	28.0 Gal.	597.62
** M-W-3	601.61	595.13	7.0 Gal.	592.88
** B-W-2	608.43	596.33	20.0 Gal.	596.28
* M-W-2	607.54	584.54	0.05Gal.	Dry
** B-W-4	607.08	599.23	65.0 Gal.	599.23
** B-W-5	603.33	597.69	25.0 Gal.	597.63
B-W-6	607.04	593.03	25.0 Gal.	590.74
O-W-1 South	608.81	603.22	N/A ****	N/A
O-W-2 North	607.06	601.36	N/A	N/A

* Well dry no samples collected
** Purged on 3/29 - sampled on 3/29
*** Purged on 3/28 - sampled on 3/29

Scott MacFarlane
Field Technician

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

Analytical Parameter(s)	Method No.	Quant. Limits				
			AES Lab No. -	3004	3005	3006
			Sample ID -	BW 1	BW 6	TRIP BLANK
			Sample Date-	GRAB 03/28/90	GRAB 03/28/90	GRAB 03/28/90
Nitrite (mg/l)	353.2	0.01		BQL *	BQL	BQL
Ammonia (as N) (mg/l)	350.1	0.01		2.0	0.22	0.05
Total Kjeldahl Nitrogen(mg/l)	351.2	0.1		0.8	0.8	BQL

* Below Quantifiable Limits.

M. Shauna Pandolfino
Inorganic Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

(All results are in mg/l)

Analytical Parameter(s)	Method No.	Quant. Limits		AES Lab No. - 3004 Sample ID - BW-1	3005 BW-6	3006 TRIP BLANK
			Sample Date-	GRAB 03/28/90	GRAB 03/28/90	GRAB 03/28/90
Soluble Iron (Fe)	236.1	0.30		1.07	5.10	BQL *
Total Iron (Fe)	236.1	0.30		2.12	38.8	NR **
Total Potassium (K)	258.1	1.00		3.49	3.35	BQL
Soluble Potassium (K)	258.1	1.00		3.25	2.36	NR
Total Zinc (Zn)	289.1	0.05		0.53	0.13	BQL
Soluble Zinc (Zn)	289.1	0.05		0.19	0.08	NR

* Below Quantifiable Limits.
** Not Required.

M. Shauna Pandolfino
Inorganic Supervisor

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

Analytical Parameters	Sample No.	Original Conc.	Duplicate Conc.	Average Conc.	Range	Rel. % Difference
Iron	3005S	5.10	5.10	5.10	0	0
Potassium	3005S	2.31	2.42	2.36	0.11	4.7
Zinc	3005S	0.09	0.08	0.08	0.01	12.5
Ammonia	3005	0.22	0.22	0.22	0	0
Nitrite	3005	BQL *	BQL	BQL	NA **	NA
Total Kjeldahl Nitrogen	3005	0.8	0.8	0.8	0	0

Relative Percent Difference =
Range/Average X 100
* Below Quantifiable Limits. ** Not Available.

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*
Iron	3005S	SPK ***	8.04	2.55	5.00	110
EPA (Fe) STD	988	STD	0.99	1.00	---	99
Potassium	3005S	SPK	21.4	2.36	20.0	95
EPA (K) STD	988-7	STD	10.4	10.0	---	104
Zinc	3005S	SPK	1.10	0.08	1.00	102
EPA (Zn) STD	989	STD	0.51	0.50	---	102
Ammonia	3005	SPK	0.46	0.22	0.25	96
Ammonia	---	EPA	1.7	2.0	---	85
Nitrite	3005	SPK	0.24	BQL **	0.25	96
Nitrite	---	EPA	1.8	2.0	---	90
Total Kjeldahl Nitrogen	3005	SPK	6.0	0.8	5.0	104
Total Kjeldahl Nitrogen	---	EPA	5.20	5.28	---	98

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

** Below Quantifiable Limits.

*** Spike performed on a sample dilution.

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

Analytical Parameter(s)	Method No.	Quant. Limits		AES Lab No. - 3038 Sample ID - MW 1 Sample Date- GRAB 03/29/90	AES Lab No. - 3039 Sample ID - BW 2 Sample Date- GRAB 03/29/90	AES Lab No. - 3040 Sample ID - MW 3 Sample Date- GRAB 03/29/90	AES Lab No. - 3041 Sample ID - BLIND DUP Sample Date- GRAB 03/29/90
Nitrite (mg/l)	353.2	0.01		0.06	0.03	0.02	0.03
Ammonia (as N) (mg/l)	350.1	0.01		8.5	0.42	0.02	0.44
Total Kjeldahl Nitrogen(mg/l)	351.2	0.1		12.0	1.1	0.3	1.2

M. Shauna Pandolfino
Inorganic Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

(All results are in mg/l)

Analytical Parameter(s)	Method No.	Quant. Limits		AES Lab No. -	3038	2039	3040	3041
				Sample ID -	MW 1	BW 2	MW 3	BLIND DUP
			Sample Date-		GRAB 03/29/90	GRAB 03/29/90	GRAB 03/29/90	GRAB 03/29/90
Total Iron (Fe)	236.1	0.30			246	30.0	39.4	36.2
Soluble Iron (Fe)	236.1	0.30			3.61	1.03	4.46	0.60
Total Potassium (K)	258.1	1.00			53.4	48.2	9.94	53.0
Soluble Potassium (K)	258.1	1.00			52.0	42.1	2.00	65.3
Total Zinc (Zn)	289.1	0.05			3.6	29.6	0.64	29.2
Soluble Zinc (Zn)	289.1	0.05			0.17	0.71	0.17	0.86

M. Shauna Pandolfino
Inorganic Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

Analytical Parameter(s)	Method No.	Quant. Limits		AES Lab No. - 3042 / Sample ID - BW 3	AES Lab No. - 3043 / Sample ID - BW 4	AES Lab No. - 3044 / Sample ID - BW 5
			Sample Date-	GRAB 03/29/90	GRAB 03/29/90	GRAB 03/29/90
Nitrite (mg/l)	353.2	0.01		BQL *	BQL	0.01
Ammonia (as N) (mg/l)	350.1	0.01		0.09	4.26	0.05
Total Kjeldahl Nitrogen(mg/l)	351.2	0.10		0.30	5.1	0.45

* Below Quantifiable Limits.

M. Shauna Pandolfino
Inorganic Supervisor

ADVANCED ENVIRONMENTAL SERVICES, INC.
LABORATORY REPORT

Type of Analysis: INORGANICS

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

(All results are in mg/l)

Analytical Parameter(s)	Method No.	Quant. Limits				
			AES Lab No. -	3042	3043	3044
			Sample ID -	BW 3	BW 4	BW 5
			Sample Date-	GRAB 03/29/90	GRAB 03/29/90	GRAB 03/29/90
Total Iron (Fe)	236.1	0.30		0.56	2.88	48.6
Soluble Iron (Fe)	236.1	0.30		0.46	2.37	3.44
Total Potassium (K)	258.1	1.00		2.02	18.6	2.24
Soluble Potassium (K)	258.1	1.00		2.47	17.0	2.43
Total Zinc (Zn)	289.1	0.05		0.50	0.30	3.35
Soluble Zinc (Zn)	289.1	0.05		0.47	0.19	0.18

M. Shauna Pandolfino
Inorganic Supervisor

AES INORGANICS DEPARTMENT TRACEABILITY

JOB CODE: CTC

Technician Signature	AES Sample #	Method	Date of Analysis
Jarvis	3004-06	236.1 (T+S)	4-5-90
Mack Morris	3004-06	258.1 (T+S)	4-6-90
Mack Morris	3004-06	289.1 (T+S)	4-6-90
T. Akor	3004-06	350.1	4-6-90
T. Akor	3004-06	351.2	4-4-90
T. Akor	3004-06	353.2	3-30-90

AES INORGANICS DEPARTMENT TRACEABILITY

JOB CODE: CTC

Technician Signature	AES Sample #	Method	Date of Analysis
Jars	3038-44	236.1 (T+S)	4-5-90
Mark Moore	3038-44	258.1 (T+S)	4-6-90
Mark Moore	3038-44	289.1 (T+S)	4-6-90
T. Akon	3038-44	350.1	4-6-90
T. Akon	3038-44	351.2	4-11-90
T. Akon	3038-44	353.2	3-30-90

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.-	3005	3006	3043
			Sample ID -	BW 6 GRAB	TRIP BLANK GRAB	BW 4 GRAB
			Sample Date-	03/28/90	03/28/90	03/29/90
Chloromethane	SW8240	10		BQL *	BQL	BQL
Vinyl Chloride	"	"		BQL	BQL	250
Chloroethane	"	"		BQL	BQL	BQL
Bromomethane	"	"		BQL	BQL	BQL
2-Chloroethylvinylether	"	"		BQL	BQL	BQL
Ethylbenzene	"	5.0		BQL	BQL	BQL
Methylene Chloride	"	10		BQL	BQL	BQL
Chlorobenzene	"	5.0		BQL	BQL	BQL
1,1-Dichloroethylene	"	"		BQL	BQL	BQL
1,1-Dichloroethane	"	"		BQL	BQL	BQL
trans-1,2-Dichloroethylene	"	"		BQL	BQL	BQL
Chloroform	"	"		BQL	BQL	BQL
1,2-Dichloroethane	"	"		BQL	BQL	BQL
1,1,1-Trichloroethane	"	"		BQL	BQL	BQL
Carbon Tetrachloride	"	"		BQL	BQL	BQL
Bromodichloromethane	"	"		BQL	BQL	BQL
1,2-Dichloropropane	"	"		BQL	BQL	BQL
trans-1,3-Dichloropropene	"	"		BQL	BQL	BQL
Trichloroethylene	"	"		BQL	BQL	290
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

* 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

Analytical Parameter(s)	Method No.	Quant. Limits	AES Lab No.-	3005	3006	3043
			Sample ID -	BW 6 GRAB	TRIP BLANK GRAB	BW 4 GRAB
			Sample Date-	03/28/90	03/28/90	03/29/90
Tetrachloroethylene	SW8240	5.0		BQL *	BQL	300
1,1,2,2-Tetrachloroethane	"	"		BQL	BQL	BQL
Toluene	"	"		BQL	BQL	BQL
Acetone	"	50		BQL	BQL	BQL
Carbon Disulfide	"	10		BQL	BQL	BQL
2-Butanone	"	50		BQL	BQL	BQL
Vinyl Acetate	"	10		BQL	BQL	BQL
2-Hexanone	"	50		BQL	BQL	BQL
4-Methyl-2-Pentanone	"	50		BQL	BQL	BQL
Styrene	"	10		BQL	BQL	BQL
o-Xylene	"	5.0		BQL	BQL	BQL
m/p-Xylene	"	5.0		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.-	3005	3006	3043
			Sample ID -	BW 6 GRAB	TRIP BLANK GRAB	BW 4 GRAB
			Sample Date-	03/28/90	03/28/90	03/29/90
2-Methylnaphthalene	SW8270	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)Ether	"	"		BQL	BQL	BQL
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	BQL	19
Hexachlorocyclopentadiene	"	"		BQL	BQL	BQL
2-Chloronaphthalene	"	"		BQL	BQL	BQL
Dimethylphthalate	"	"		BQL	BQL	BQL
Acenaphthylene	"	"		BQL	BQL	BQL
2,6-Dinitrotoluene	"	"		BQL	BQL	BQL
Acenapthene	"	"		BQL	BQL	BQL
2,4-Dinitrotoluene	"	"		BQL	BQL	BQL
Diethylphthalate	"	"		BQL	BQL	BQL
Fluorene	"	"		BQL	BQL	BQL
4-Chlorophenylphenylether	"	"		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.-	3005	3006	3043
			Sample ID -	BW 6	TRIP BLANK	BW 4
				GRAB	GRAB	GRAB
			Sample Date-	03/28/90	03/28/90	03/29/90
N-Nitrosodiphenylamine	SW8270	10		BQL *	BQL	BQL
Benzyl Alcohol	"	20		BQL	BQL	BQL
4-Chloroaniline	"	10		BQL	BQL	BQL
4-Bromophenylphenylether	"	"		BQL	BQL	BQL
Hexachlorobenzene	"	"		BQL	BQL	BQL
Phenanthrene	"	"		BQL	BQL	BQL
Anthracene	"	"		BQL	BQL	BQL
Di-N-Butylphthalate	"	"		BQL	BQL	BQL
Fluoranthene	"	"		BQL	BQL	BQL
2-Nitroaniline	"	15		BQL	BQL	BQL
Pyrene	"	10		BQL	BQL	BQL
Butylbenzylphthalate	"	"		BQL	BQL	BQL
Benzo(a)Anthracene	"	"		BQL	BQL	BQL
3,3'-Dichlorobenzidine	"	20		BQL	BQL	BQL
Chrysene	"	10		BQL	BQL	BQL
Bis(2-Ethylhexyl)Phthalate	"	20		BQL	BQL	BQL
Di-N-Octylphthalate	"	10		BQL	BQL	BQL
Benzo(b)Fluoranthene	"	"		BQL	BQL	BQL
Benzo(k)Fluoranthene	"	"		BQL	BQL	BQL
Benzo(a)Pyrene	"	"		BQL	BQL	BQL
Indeno(1,2,3-cd)Pyrene	"	15		BQL	BQL	BQL
Dibenz(a,h)Anthracene	"	"		BQL	BQL	BQL
Benzo(g,h,i)Perylene	"	"		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.-	3005	3006	3043
			Sample ID -	BW 6	TRIP BLANK	BW 4
				GRAB	GRAB	GRAB
			Sample Date-	03/28/90	03/28/90	03/29/90
Phenol	SW8270	10		BQL *	BQL	BQL
2-Chlorophenol	"	"		BQL	BQL	BQL
2-Nitrophenol	"	"		BQL	BQL	BQL
2,4-Dimethylphenol	"	"		BQL	BQL	BQL
4-Chloro-3-Methylphenol	"	"		BQL	BQL	BQL
2,4,6-Trichlorophenol	"	"		BQL	BQL	BQL
2,4-Dinitrophenol	"	40		BQL	BQL	BQL
4-Nitrophenol	"	30		BQL	BQL	BQL
4,6-Dinitro-2-Methylphenol	"	30		BQL	BQL	BQL
Pentachlorophenol	"	20		BQL	BQL	BQL
2,4-Dichlorophenol	"	10		BQL	BQL	BQL
4-Methylphenol	"	10		BQL	BQL	BQL
Benzoic Acid	"	30		BQL	BQL	BQL
2,4,5-Trichlorophenol	"	10		BQL	BQL	BQL
3-Nitroaniline	"	15		BQL	BQL	BQL
Dibenzofuran	"	10		BQL	BQL	BQL
4-Nitroaniline	"	15		BQL	BQL	BQL
2-Methylphenol	"	10		BQL	BQL	BQL
Benzidine	"	30		BQL	BQL	BQL
1,2-Diphenylhydrazine	"	10		BQL	BQL	BQL
Aniline	"	10		BQL	BQL	BQL

* 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	3005	<10	<10	<10	N/A*	N/A
Vinyl Chloride	"	"	"	"	"	"
Chlororethane	"	"	"	"	"	"
Bromomethane	"	"	"	"	"	"
2-Chloroethylvinylether	"	"	"	"	"	"
Ethylbenzene	"	<5.0	<5.0	<5.0	"	"
Methylene Chloride	"	<10	<10	<10	"	"
Chlorobenzene	"	<5.0	<5.0	<5.0	"	"
1,1-Dichloroethylene	"	"	"	"	"	"
1,1-Dichloroethane	"	"	"	"	"	"
trans-1,2-Dichloroethylene	"	"	"	"	"	"
Chloroform	"	"	"	"	"	"
1,2-Dichloroethane	"	"	"	"	"	"
1,1,1-Trichloroethane	"	"	"	"	"	"
Carbon Tetrachloroethane	"	"	"	"	"	"
Bromodichloromethane	"	"	"	"	"	"
1,2-Dichloropropane	"	"	"	"	"	"
trans-1,3-Dichloropropene	"	"	"	"	"	"
Trichloroethylene	"	"	"	"	"	"
Benzene	"	"	"	"	"	"
cis-1,3-Dichloropropene	"	"	"	"	"	"
1,1,2-Trichloroethane	"	"	"	"	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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
Dibromochloromethane	3005	<5.0	<5.0	<5.0	N/A*	N/A
Bromoform	"	"	"	"	"	"
Tetrachloroethylene	"	"	"	"	"	"
1,1,2,2-Tetrachloroethane	"	"	"	"	"	"
Toluene	"	"	"	"	"	"
Acetone	"	<50	<50	<50	"	"
Carbon Disulfide	"	<10	<10	<10	"	"
2-Butanone	"	<50	<50	<50	"	"
Vinyl Acetate	"	<10	<10	<10	"	"
2-Hexanone	"	<50	<50	<50	"	"
4-Methyl-2-Pentanone	"	"	"	"	"	"
Styrene	"	<5.0	<5.0	<5.0	"	"
o-Xylene	"	"	"	"	"	"
m/p-Xylene	"	"	"	"	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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
2-Methylnaphthalene	3005	<10	<10	<10	N/A*	N/A
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	"	"	"	"	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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
Diethylphthalate	3005	<10	<10	<10	N/A*	N/A
Fluorene	"	"	"	"	"	"
4-Chlorophenylphenylether	"	"	"	"	"	"
N-Nitrosodiphenylamine	"	"	"	"	"	"
Benzyl Alcohol	"	<20	<20	<20	"	"
4-Chloroaniline	"	<10	<10	<10	"	"
4-Bromophenylphenylether	"	"	"	"	"	"
Hexachlorobenzene	"	"	"	"	"	"
Phenanthrene	"	"	"	"	"	"
Anthracene	"	"	"	"	"	"
Di-N-Butylphthalate	"	"	"	"	"	"
Fluoranthene	"	"	"	"	"	"
2-Nitroaniline	"	<15	<15	<15	"	"
Pyrene	"	<10	<10	<10	"	"
Butylbenzylphthalate	"	"	"	"	"	"
Benzo(a)Anthracene	"	"	"	"	"	"
3,3'-Dichlorobenzidine	"	<20	<20	<20	"	"
Chrysene	"	<10	<10	<10	"	"
Bis(2-Ethylhexyl)Phthalate	"	<20	<20	<20	"	"
Di-N-Octylphthalate	"	<10	<10	<10	"	"
Benzo(b)Fluoranthene	"	"	"	"	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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
Benzo(k) Fluoranthene	3005	<10	<10	<10	N/A*	N/A
Benzo(a)Pyrene	"	"	"	"	"	"
Indeno(1,2,3-cd)Pyrene	"	<15	<15	<15	"	"
Dibenz(a,h)Anthracene	"	"	"	"	"	"
Benzo(g,h,i)Perylene	"	"	"	"	"	"
Benzidine	"	<30	<30	<30	"	"
4-Nitroaniline	"	<15	<15	<15	"	"
3-Nitroaniline	"	"	"	"	"	"
Dibenzofuran	"	<10	<10	<10	"	"
Phenol	"	"	"	"	"	"
2-Chlorophenol	"	"	"	"	"	"
2-Nitrophenol	"	"	"	"	"	"
2,4-Dimethylphenol	"	"	"	"	"	"
4-Chloro-3-Methylphenol	"	"	"	"	"	"
2,4,6-Trichlorophenol	"	"	"	"	"	"
2,4-Dinitrophenol	"	<40	<40	<40	"	"
4-Nitrophenol	"	<30	<30	<30	"	"
4,6-Dinitro-2-Methylphenol	"	"	"	"	"	"
Pentachlorophenol	"	<20	<20	<20	"	"
2,4-Dichlorophenol	"	<10	<10	<10	"	"
4-Methylphenol	"	"	"	"	"	"
2,4,5-Trichlorophenol	"	"	"	"	"	"
2-Methylphenol	"	"	"	"	"	"
Benzoic Acid	"	<30	<30	<30	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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
1,2-Diphenylhydrazine	3005	<10	<10	<10	N/A*	N/A
Aniline	"	"	"	"	"	"

Relative Percent Difference =
Range/Average X 100
* Not Available

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*
Phenol	3005	SPK	57	<10	100	57
2-Chlorophenol	"	"	80	"	"	80
1,3-Dichlorobenzene	"	"	64	"	"	64
N-Nitrosodipropylamine	"	"	87	"	"	87
1,2,4-Trichlorobenzene	"	"	79	"	"	79
4-Chloro-3-Methylphenol	"	"	107	"	"	107
Acenaphthene	"	"	71	"	"	71
4-Nitrophenol	"	"	32	<30	"	32
2,4-Dinitrotoluene	"	"	107	<10	"	107
Pentachlorophenol	"	"	78	<20	"	78
Pyrene	"	"	99	<10	"	99
1,1-Dichloroethene	3005	SPK	20	<5.0	20	100
trans-1,2-Dichloroethene	"	"	21	"	"	105
1,1-Dichloroethane	"	"	20	"	"	100
Chloroform	"	"	19	"	"	95
1,1,1-Trichloroethane	"	"	19	"	"	95
Carbon Tetrachloride	"	"	16	"	"	80
Trichloroethene	"	"	19	"	"	95

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

AES ORGANICS DEPARTMENT TRACEABILITY

JOB CODE: CTC

Technician Signature	AES Sample #	Method	Date of Analysis	Extrac Dat
Jm Tuyla	3005, 3006	EPA 8240	3/30/90	—
	3005, 3006	EPA 8270	4/5/90	

AES ORGANICS DEPARTMENT TRACEABILITY

JOB CODE: CTC

Technician Signature	AES Sample #	Method	Date of Analysis	Extrac Dat
Jim Fugh	3043	EPA 8240	4/3/90	
Jim Fugh	3043	EPA 8270	4/9/90	

APPENDIX A

CHAIN OF CUSTODY RECORDS

ADVANCED ENVIRONMENTAL SERVICES INC.
2186 LIBERTY DRIVE
NIAGARA FALLS, NY 14304
(716) 283-3120

CHAIN OF CUSTODY RECORD

JOB CODE: CTC

PROJECT NAME: UNION CARBIDE

SAMPLER'S SIGNATURE: Matt Mayfarlane

SAMPLE NO.	SEQ. NO.	DATE	TIME	SAMPLE LOCATION	GRAB	COMP	SAMPLE TYPE	NO. OF CONTAINERS	REMARKS
	1	3/29/96	910	M-W-1	✓	✓	Metals, Ammonia, TKN	4	Nitrate,
	2	"	955	B-W-2	✓	✓		4	
	3	"	235	M-W-3	✓	✓		4	
	4	"	—	Blind Dup	✓	✓		4	
	5	"	1100	B-W-3	✓	✓		4	
	6	"	1240	B-W-4	✓	✓	VOAs - Semi. VOAs	7	
	7	"	315	B-W-5	✓	✓		4	
							TOTAL CONTAINERS	31	

	DATE	TIME	
RELINQUISHED BY (Sign) 1 Matt Mayfarlane	3/29/96	505 pm	RECEIVED BY (Sign) 2
RELINQUISHED BY (Sign) 2	DATE	TIME	RECEIVED BY (Sign) 3
RELINQUISHED BY (Sign) 3	DATE	TIME	RECEIVED BY (Sign) 4
R. NQUISHED BY (Sign) 4	DATE	TIME	RECEIVED BY (Sign) 5

REMARKS:

ADVANCED ENVIRONMENTAL SERVICES INC.

CHAIN OF CUSTODY RECORD

JOB CODE: CTC

PROJECT NAI: UNION

SAMPLER'S SIGNATURE: Scott MacFarlane

SAMPLE NO.	SEQ. NO.	DATE	TIME	SAMPLE LOCATION
	1	8	3-28-90	Trip Blank
	2	3-28-90	10:5	B-W-1
	3	"	12	B-W-6

RELINQUISHED BY (Sign)

1 Scott MacFarlane

RELINQUISHED BY (Sign)

2

RELINQUISHED BY (Sign)

3

RELINQUISHED BY (Sign)

4

REMARKS: