F I N A L R E P O R T

ENHANCED IN-SITU BIOREMEDIATION

REPORT ON PRELIMINARY FIELD TESTING

Prepared for
El Dorado Chemical Company
El Dorado, Arkansas

October 13, 1999

File No. 3500009153.00

URS Greiner Woodward Clyde
A Division of URS Corporation

2822 O'Neal Lane
Baton Rouge, Louisiana 70816
(225) 751-1873

URS Greiner Woodward Clyde
A Division of URS Corporation

2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616
Offices Worldwide

October 13, 1999

Mr. Keith Brown
Manager, State Permits, Water Division
Arkansas Department of Environmental Quality
8001 National Drive
Little Rock, Arkansas 72219-8913

Re: Enhanced In-Situ Bioremediation
Report on Preliminary Field Testing
El Dorado Chemical Company
El Dorado, Arkansas
URSGWC File No. 3500009153.00

Dear Mr. Brown:

Attached are three copies of the referenced report for you, Art Riddle, and Belinda Colby. If you have questions or comments, we can be reached at (225) 756-1431.

Sincerely,

Dennis E. Reece
Vice President

William Beal, P.G., P.E.

Attachments

DER:cm

cc: Art Riddle, ADEQ
Belinda Colby, ADEQ

W:\ELDORADO\350000915300\RPT-PFT-ISB-CVL.DOC

F I N A L R E P O R T

ENHANCED IN-SITU BIOREMEDIATION

REPORT ON PRELIMINARY FIELD TESTING

Prepared for
El Dorado Chemical Company
El Dorado, Arkansas

October 13, 1999

File No. 3500009153.00

URS Greiner Woodward Clyde
A Division of URS Corporation

2822 O'Neal Lane
Baton Rouge, Louisiana 70816
(225) 751-1873

TABLE OF CONTENTS

TABLES

APPENDICES

URSGWC conducted the preliminary field tests in monitor wells MW-11 and MW-17 from May 27 – August 6, 1999 in accordance with the plan presented in the April 14, 1999 report "Initial Sampling and Testing and Plan for Preliminary Field Testing" prepared by URSGWC.

The tests involved pumping groundwater from each monitor well, amending the groundwater by addition of nutrients and pH buffer, and returning the amended groundwater back into the well. The purpose of the amendments was to create conditions in the groundwater at each of the two monitor wells that would be conducive to denitrifying bacteria and consequently to reduce the nitrate concentrations.

The initial amendments to the groundwater were as follows:

- Groundwater volume withdrawn-initially 20 and 50 gallons at MW-11 and MW-17, respectively, and 7 and 17 gallons, respectively, after May 27, 1999
- Carbon/electron donor source-trisodium citrate at approximately 31 and 27 mg/l at MW-11 and MW-17, respectively
- Phosphate-trisodium phosphate at 3.8 and 10 mg/L at MW-11 and MW-17, respectively
- pH buffering-soda ash to bring pH to 6 – 6.5

Nitrate, pH and other parameters were monitored in the withdrawn groundwater. Withdrawal and amendment of groundwater was on a weekly basis from May 27 through July 8, 1999 and was completed every other week from July 8 through August 6, 1999.

Based on monitoring results, additional pH buffering and nutrients were added in the amendments during the course of the test. The pH was adjusted to 7.5 – 8.5. Trisodium citrate concentration was increased starting July 1, 1999 to approximately 190 and 624 mg/L at MW-11 and MW-17, respectively. Trisodium phosphate was increased to approximately 19 and 24 mg/L at MW-11 and MW-17, respectively, starting July 1, 1999. The volume of groundwater withdrawn and amended at MW-11 was also increased to 55 gallons starting July 1, 1999. Beginning July 23, 1999, the withdrawn groundwater was also amended with glucose to an approximate concentration of 100 mg/L to provide additional carbon/electron donor source.

To evaluate the capability for denitrification under controlled pH conditions, a laboratory test was conducted as follows:

- On July 23, 1999, four samples were collected of withdrawn groundwater from MW-17 after addition of nutrient and pH buffering amendments. The samples were collected in BOD bottles, sealed and transported to the laboratory. The pH of the amended water was 8.5.
- One bottle was analyzed for nitrate and Total Organic Carbon (TOC) approximately each week for four weeks.

The results were then used to evaluate whether the amended water, under controlled conditions, was capable of fostering growth of denitrifying bacteria and reducing nitrate concentrations.

Tables 1 and 2 present preliminary summaries of the analytical results for the withdrawn groundwater (pre-addition of amendments) from MW-11 and MW-17, respectively. Note, the field test kit analytical results for nitrate were found to be unreliable, probably due to a negative interference, and are consistently much lower than the concentrations from the laboratory analyses. Consequently, the laboratory results for nitrate were used for interpretation of results rather than the field analyses. Appendix A presents the laboratory reports.

Two analytes (pH and nitrate) are key in interpreting the results. The pH data indicate that the addition of soda ash as a buffering agent during the preliminary field test did not always result in raising the in-situ groundwater pH to near neutral during the duration of the test. This indicates that an improved method for adding alkalinity to the groundwater needs to be developed to create proper pH conditions for denitrification. The pH at MW-11 was essentially unchanged by the addition of the amended groundwater and ranged from only 4.2 to 4.6 during the test. The pH at MW-17 increased from a low of 4.24 to a maximum of 6.2 during the test, but appeared to stabilize at approximately 5.9. Nitrate concentration at MW-11 and MW-17 was essentially unchanged. Nitrate concentration at MW-11 fluctuated within a range of 7.8 to 13 mg/L and at MW-17 fluctuated within a range of 66.9 to 102 mg/L.

By contrast, the samples of amended groundwater withdrawn from MW-17 on July 23, 1999 and analyzed in the laboratory at one-week intervals demonstrated rapid and near complete denitrification. The analytical results were as follows:

- Nitrate concentration at time of sample collection – 98 mg/L
- Nitrate concentration at approximately one week after sample collection – 0.01 mg/L
- Nitrate concentration at approximately two weeks after sample collection – 0.04 mg/L
- Nitrate concentration at approximately three weeks after sample collection – 0.03 mg/L
- Nitrate concentration at approximately four weeks after sample collection – 0.31 mg/L

These results indicate that the amended groundwater that had been kept in anaerobic conditions similar to that in the subsurface exhibited essentially complete denitrification

within one week. Conditions toxic to denitrifying bacteria were not indicated, rather, the results indicate that the conditions in the amended groundwater are very favorable for denitrification. Percent removals of nitrate ranged from 99.68 to 99.99 percent. The resulting nitrate concentrations were far below the MCL of 10 mg/L.

The laboratory test of the amended groundwater from MW-17 demonstrated that denitrification will proceed rapidly when the pH is raised and sufficient organic carbon is present. The preliminary field test results indicate that the critical factor in achieving denitrification is pH of the in-situ groundwater. The preliminary field test results also indicate that raising the pH will require addition of more base to the groundwater than was accomplished during the preliminary field tests.

Overall, the test results indicate that enhanced in-situ biodegradation can be feasible in conjunction with pH adjustment.

The preliminary field tests and laboratory test demonstrated that denitrification is potentially applicable to the site and that additional base needs to be added to the groundwater to raise the in-situ pH to a range conducive to denitrification.

Consequently, additional field testing will be conducted. The additional field tests will focus on raising the in-situ pH to neutral or above at MW-17. MW-17 was selected since the nitrate concentration is much higher than at MW-11. Note that nitrate concentrations at MW-11 were frequently (five of seven laboratory analyses) slightly below 10 mg/L during the preliminary field tests. In the additional field testing, pH will be the only parameter monitored until the pH is raised to neutral or above. When the pH has been raised sufficiently, nitrate and TOC will be monitored and nutrients will be added. At the completion of the test, other parameters as listed in Table 3 will be analyzed.

The additional field tests will be conducted as follows:

Four small diameter piezometers will be installed with Geoprobe® type techniques in a semicircle upgradient of MW-17. The piezometers will be located approximately 6 feet from MW-17. Periodically, water will be pumped from MW-17 and will be amended with sodium hydroxide to a pH of between 8.5 and 10. The amended water will be recharged into each of the small diameter wells. The amount of water withdrawn and recharged is expected to be considerably greater than that during the previous tests. Initially a total of 500 gallons per week is planned to be added. Depending on the rate of recharge, this volume may be adjusted. pH of the water withdrawn from MW-17 will be measured. When the pH is raised to near neutral, the nitrate and TOC concentrations will be measured for water withdrawn from MW-17, and, as necessary, nutrients (similar to that added in the preliminary field tests) will be added to the water recharged through the temporary wells. A more complete chemical analysis (Table 3) will be completed on a single sample at the completion of the test. Duration of the test will depend on the results of measurements of pH and nitrate. A report of the completed tests will be submitted to the ADEQ within six months of the start of the tests.

TABLES

TABLE 1

ANALYTICAL RESULTS
PRELIMINARY FIELD TESTS
IN-SITU ENHANCED BIODEGRADATION MONITORING RESULTS FOR MW-11

Parameter	5/27/99	6/3/99	6/10/99	6/17/99	6/24/99	7/1/99	7/8/99	7/23/99	8/6/99
pH (S.U.)	4.21	4.21	4.2	4.25	4.3	4.3	4.6	4.5	4.3
Dissolved Oxygen (mg/L)	0.42	0.41	0.41	0.34	0.32	0.25	0.35	0.36	0.4
Carbon Dioxide (mg/L)	250	325	400	NA	350	400	350	NA	350
Nitrite (mg/L as N)	0.02	0.08	0.05	NA	0.7	0.07	0.05	NA	0.05
Phosphate (mg/L as P)	ND	ND	ND	ND	ND	ND	NA	0.1	ND
Denitrifying Bacteria (CFU/ml)	Negative	Negative	Negative	NA	Negative	NA	Negative	NA	Negative
Ferrous Iron (mg/L)	0.03	0.08	NA	NA	0.12	NA	NA	NA	ND
Oxidation Reduction Potential (mv)	350	NA	NA	303	322	327	272	192	NA
Field Nitrate (mg/L as N)	7	1	9	5	7	7	4	7	8
Laboratory Nitrate (mg/L as N)	NA	10.9	13	9.6	9	NA*	9.1	7.8	8
Ammonia (mg/L as N)	>3	7	>3	NA	>3	NA	>3	NA	>3
Total Kjeldahl Nitrogen (mg/L as N)	6.2	14	NA	NA	6.7	NA	NA	NA	5.9
Total Organic Carbon (mg/L)	24.2	22.9	21.8	NA	27.8	NA	24.5	NA	40.8
Alkalinity (mg/L as $CaCO_3$)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Temperature (degrees C)	18.5	21.3	20.4	20.7	19.4	20.2	19.4	20.8	20.5

NOTES:
ND = Not Detected
NA = Not Analyzed
* Indicates sample bottle broke during transport to the laboratory.

TABLE 2

ANALYTICAL RESULTS
PRELIMINARY FIELD TESTS
IN-SITU ENHANCED BIODEGRADATION MONITORING RESULTS FOR MW-17

Parameter	5/27/99	6/3/99	6/10/99	6/17/99	6/24/99	7/1/99	7/8/99	7/23/99	8/6/99
pH (S.U.)	3.93	4.24	4.8	4.71	5	5.6	6.2	5.9	5.9
Dissolved Oxygen (mg/L)	0.49	0.51	0.5	0.9	0.43	1.4	3.65	0.43	1.2
Carbon Dioxide (mg/L)	120	130	120	NA	110	110	60	NA	70
Nitrite (mg/L as N)	ND	0.2	0.45	NA	0.4	0.5	0.5	NA	0.3
Phosphate (mg/L as P)	ND	ND	ND	ND	ND	0.15	0.45	0.4	0.8
Denitrifying Bacteria (CFU/ml)	Negative	Negative	Negative	NA	Negative	NA	Negative	NA	Negative
Ferrous Iron (mg/L)	0.02	0.07	NA	NA	0.05	NA	NA	NA	ND
Oxidation Reduction Potential (mv)	352	NA	NA	225	285	264	204	139	169
Field Nitrate (mg/L as N)	20	15	25	22	23	20	13	15	20
Laboratory Nitrate (mg/L as N)	NA	102	75	96	88	NA*	66.9	98	73
Ammonia (mg/L as N)	2.3	1.3	2	NA	2.5	NA	2.8	NA	3
Total Kjeldahl Nitrogen (mg/L as N)	ND	ND	NA	NA	ND	NA	NA	NA	ND
Total Organic Carbon (mg/L)	ND	3.9	ND	NA	4.3	NA	4.2	NA	4
Alkalinity (mg/L as $CaCO_3$)	ND	3	ND	ND	ND	NA	70	35	37
Temperature (degrees C)	19.2	21.3	19.4	20.1	20.3	18.8	18.9	19.2	19.5

NOTES:
ND = Not Detected
NA = Not Analyzed
* Indicates sample bottle broke during transport to the laboratory.

TABLE 3

GROUNDWATER ANALYTICAL PARAMETERS
MW-17 AT COMPLETION OF ADDITIONAL TESTING
EL DORADO CHEMICAL COMPANY
EL DORADO, ARKANSAS

Analyte	Field or Laboratory
pH	Field
Dissolved Oxygen	Field
Carbon Dioxide	Field
Temperature	Field
Denitrifying Bacteria	Field
Nitrite	Laboratory
Nitrate	Laboratory
Ammonia	Laboratory
Total Kjeldahl Nitrogen	Laboratory
Phosphate	Laboratory
Total Organic Carbon	Laboratory

APPENDIX A

LABORATORY REPORTS

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/08/1999

GCAL REPORT NO: 9903604

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280058	WATER	MW11	05/27/1999 14:45	05/28/1999 15:15
9905280059	WATER	MW17	05/27/1999 12:05	05/28/1999 15:15

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (504) 769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280058	WATER	MW11	05/27/1999 14:45	05/28/1999 15:15

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Total Kjeldahl Nitrogen	4500-NH3 BE	06/01/1999 08:00	06/01/1999 15:50
Total Organic Carbon	5310 B		06/04/1999 20:15

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	24.2	(mg/L C)	1	1	103008	jar
Total Kjeldahl Nitrogen	6.2	(mg/L N)	1	1	102591	ktf

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280059	WATER	MW17	05/27/1999 12:05	05/28/1999 15:15

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Total Kjeldahl Nitrogen	4500-NH3 BE	06/01/1999 08:00	06/01/1999 15:50
Total Organic Carbon	5310 B		06/04/1999 20:15

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	<DL	(mg/L C)	1	1	103008	jar
Total Kjeldahl Nitrogen	<DL	(mg/L N)	1	1	102591	ktf

QUALITY CONTROL SUMMARY

Report#: 9903604

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 102591												
Total Kjeldahl Nitrogen	(mg/L N)	<DL	1	15.0	14.6	97	179000	171000	5	15.0	13.4	89
QC Batch 103008												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	50.5	101	11.1	10.9	2	50.0	46.7	93

Woodward Clyde/0463/9903604/Due 6/5/99

WOODWARD-CLYDE CONSULTANTS

CHAIN-OF-CUSTODY-RECORD

SAMPLE NO.	YR: DATE MM/DD	TIME	SAMPLE DEPTH FROM	SAMPLE DEPTH TO	STATION LOCATION	TOTAL NO. CONTAINERS		TDC (2 bottles each)	TKN (2 bottles each)		
990528											
58 MW11	5-27-99	1445	—	—	MW-EDC-11	4		X	X		
59 MW17	5-27-99	1205	—	—	MW-EDC-17	4		X	X		

SAMPLE COLLECTION:

PROJECT NO. AND NAME 350009153.00 Insitu Bioremediation

LOCATION OF SAMPLE: El Dorado Chemical Co.

COLLECTOR'S NAME: Dennis E. Reece TELEPHONE: (225) 756-1431

COMPANY NAME: URS Greiner Woodward-Clyde

ADDRESS: 2822 O'Neal Lane

WITNESS: _____ COMPANY NAME: _____

FIELD INFORMATION

TYPES OF SAMPLES: (LIQUID) GAS SLUDGE SOIL OTHER (SPECIFY) Groundwater

FIELD NOTES: _____

TRANSPORTER: Not Applicable AIRBILL/INVOICE: _____

SAMPLE TRANSFER (Original must be retained with sample at all times)

	RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1	NAME Dennis E. Reece	5-28-99 1350	Jody Gray	5-28-99-1335
	COMPANY ~~5-28-99~~ URS&W		GCAL	
2	NAME Jody Gray	5-28-99-1515	Donna Duncan	5/28/99 1515
	COMPANY GCAL		GCAL	
3	NAME			
	COMPANY			

TERMINATION OF CHAIN-OF-CUSTODY:

3°C

AUTHORIZED BY: _____ DATE: _____ TIME: _____

COMPANY NAME: _____

SAMPLE DISPOSITION: STORAGE _____ DISPOSAL _____ OTHER _____

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/08/1999

GCAL REPORT NO: 9903604

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280058	WATER	MW11	05/27/1999 14:45	05/28/1999 15:15
9905280059	WATER	MW17	05/27/1999 12:05	05/28/1999 15:15

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (504) 769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280058	WATER	MW11	05/27/1999 14:45	05/28/1999 15:15

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Total Kjeldahl Nitrogen	4500-NH3 BE	06/01/1999 08:00	06/01/1999 15:50
Total Organic Carbon	5310 B		06/04/1999 20:15

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	24.2	(mg/L C)	1	1	103008	jar
Total Kjeldahl Nitrogen	6.2	(mg/L N)	1	1	102591	ktf

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9905280059	WATER	MW17	05/27/1999 12:05	05/28/1999 15:15

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Total Kjeldahl Nitrogen	4500-NH3 BE	06/01/1999 08:00	06/01/1999 15:50
Total Organic Carbon	5310 B		06/04/1999 20:15

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	<DL	(mg/L C)	1	1	103008	jar
Total Kjeldahl Nitrogen	<DL	(mg/L N)	1	1	102591	ktf

QUALITY CONTROL SUMMARY

Report#: 9903604

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 102591												
Total Kjeldahl Nitrogen	(mg/L N)	<DL	1	15.0	14.6	97	179000	171000	5	15.0	13.4	89
QC Batch 103008												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	50.5	101	11.1	10.9	2	50.0	46.7	93

Woodward Clyde / 0463 / 9903604 / Due 6/5/99

WOODWARD-CLYDE CONSULTANTS

CHAIN-OF-CUSTODY-RECORD

	SAMPLE NO.	YR: DATE MM/DD	TIME	SAMPLE DEPTH FROM	SAMPLE DEPTH TO	STATION LOCATION	TOTAL NO. CONTAINERS		TOC (2 bottles each)	TKN (2 bottles each)		
990528-58	MW11	5-27-99	1445	—	—	MW-EDC-11	4		X	X		
59	MW17	5-27-99	1205	—	—	MW-EDC-17	4		X	X		

SAMPLE COLLECTION:

PROJECT NO. AND NAME: 350000915300 Insitu Bioremediation

LOCATION OF SAMPLE: El Dorado Chemical Co.

COLLECTOR'S NAME: Dennis E. Reece TELEPHONE: (225) 756-1431

COMPANY NAME: URS Greiner Woodward-Clyde

ADDRESS: 2822 O'Neal Lane

WITNESS: ______ COMPANY NAME: ______

FIELD INFORMATION

TYPES OF SAMPLES: (LIQUID circled) GAS SLUDGE SOIL OTHER (SPECIFY) Groundwater

FIELD NOTES: ______

TRANSPORTER: Not Applicable AIRBILL/INVOICE: ______

SAMPLE TRANSFER (Original must be retained with sample at all times)

	RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1	NAME Dennis E. Reece	5-28-99 135pm	Jody Gray	5-28-99 - 1335
	COMPANY ~~5-28-99~~ URSGWC		GC99	
2	NAME Jody Gray	5-28-99 - 1515	Anna Kinchen	5/28/99 1515
	COMPANY GCAL		GCAL	
3	NAME			
	COMPANY			

TERMINATION OF CHAIN-OF-CUSTODY:

3°C

AUTHORIZED BY: ______ DATE: ______ TIME: ______

COMPANY NAME: ______

SAMPLE DISPOSITION: STORAGE ______ DISPOSAL ______ OTHER ______

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/16/1999

GCAL REPORT NO: 9903965

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906110102	WATER	EDC-17	06/10/1999 10:45	06/11/1999 09:20
9906110104	WATER	EDC-11	06/10/1999 13:25	06/11/1999 09:20

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906110102	WATER	EDC-17	06/10/1999 10:45	06/11/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/11/1999 18:58
Total Organic Carbon	5310 B		06/16/1999 04:23

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	<DL	(mg/L C)	1	1	103685	jar
Nitrate	75.0	(mg/L N)	5	500	103460	jeb

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906110104	WATER	EDC-11	06/10/1999 13:25	06/11/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/11/1999 18:58
Total Organic Carbon	5310 B		06/16/1999 04:23

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	21.8	(mg/L C)	1	1	103685	jar
Nitrate	13.0	(mg/L N)	1	100	103460	jeb

QUALITY CONTROL SUMMARY

Report#: 9903965

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 103460												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.96	96	75.0	95.0	24	500	505	101
QC Batch 103685												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	46.5	93	1.5	1.2	22	50.0	43.3	87

GULF COAST ANALYTICAL LABORATORIES, INC.
7979 GSRI Avenue
Baton Rouge, LA
70820-7402
(225) 769-4900 • Fax (225) 767-5717

CHAIN OF CUSTODY RECORD

Lab use only: Woodward Clyde | 0443 | 9903945 | 6/18/99

Client Name | Client # | Group # | Due Date

Report to:
Client: URSGWC
Address: ~~108~~ O'Neal Ln.
Baton Rouge, LA
Contact: Dennis Reece
Phone: 800-697-0103
Fax:

Bill to:
Client: Same
Address:
Contact:
Phone:
Fax:

Lab use only:
Custody Seal
used ☐ yes ☐ no
in tact ☐ yes ☐ no
Temperature °C 5

P.O. Number 3500009153-00001
Project Name/Number EDC In Situ Bioremediation
Sampled By: Dave Eddington

Analytical Requests & Method

Matrix¹	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	TOC	Nitrite									Remarks:	Lab ID 6111
H_2O	6-10	1045		✓	EDC-17	on label	3	✓	✓										-102
↓	↓	1325		✓	EDC-11	↓	3	✓	✓										-104

Turn Around Time: ☐ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Fed Ex	6-10-99	1940
FedEx# 812888952036	[signature]	6/11/99	0920

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

¹Matrix: W = water, S = soil, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GCAL-06 11/98

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/17/1999

GCAL REPORT NO: 9903745

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REESE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906040042	WATER	EDC-17	06/03/1999 12:40	06/04/1999 09:30
9906040049	WATER	EDC-11	06/03/1999 15:20	06/04/1999 09:30

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906040042	WATER	EDC-17	06/03/1999 12:40	06/04/1999 09:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Ammonia	4500-NH3 BE	06/07/1999 09:45	06/09/1999 15:04
Nitrite + Nitrate	353.2-N+N		06/16/1999 17:40
Total Alkalinity	SM2320 B		06/13/1999 15:28
Total Kjeldahl Nitrogen	4500-NH3 BE	06/08/1999 08:30	06/10/1999 09:00
Total Organic Carbon	5310 B		06/08/1999 06:48
Total Phosphorus	365.1	06/04/1999 15:30	06/10/1999 17:00

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	3.9	(mg/L C)	1	1	103050	ktf
Total Alkalinity	3.0	(mg/L CaCO3)	1	1	103419	jar
Nitrite + Nitrate	102	(mg/L N)	1	100	103794	bmc
Ammonia	1.3	(mg/L N)	1	1	103359	jar
Total Kjeldahl Nitrogen	<DL	(mg/L N)	1	1	103362	ktf
Total Phosphorus	<DL	(mg/L P)	0.05	1	103299	bmc

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906040049	WATER	EDC-11	06/03/1999 15:20	06/04/1999 09:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Ammonia	4500-NH3 BE	06/07/1999 09:45	06/09/1999 15:04
Nitrite + Nitrate	353.2-N+N		06/16/1999 17:40
Total Alkalinity	SM2320 B		06/13/1999 15:28
Total Kjeldahl Nitrogen	4500-NH3 BE	06/08/1999 08:30	06/10/1999 09:00
Total Organic Carbon	5310 B		06/08/1999 06:48
Total Phosphorus	365.1	06/04/1999 15:30	06/10/1999 17:00

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	22.9	(mg/L C)	1	1	103050	ktf
Total Alkalinity	<DL	(mg/L CaCO3)	1	1	103419	jar
Nitrite + Nitrate	10.9	(mg/L N)	0.1	10	103794	bmc
Ammonia	7.0	(mg/L N)	1	1	103359	jar
Total Kjeldahl Nitrogen	14.0	(mg/L N)	1	1	103362	ktf
Total Phosphorus	<DL	(mg/L P)	0.05	1	103299	bmc

QUALITY CONTROL SUMMARY

Report#: 9903745

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 103050												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	49.5	99	11.6	11.8	2	50.0	57.7	115
QC Batch 103299												
Total Phosphorus	(mg/L P)	<DL	0.05	1.00	0.97	97	1.64	1.52	8	NA	NA	
QC Batch 103359												
Ammonia	(mg/L N)	<DL	1	15.0	14.0	93	7.0	6.7	4	15.0	14.7	98
QC Batch 103362												
Total Kjeldahl Nitrogen	(mg/L N)	<DL	1	15.0	14.0	93	14.0	14.6	4	15.0	14.0	93
QC Batch 103419												
Total Alkalinity	(mg/L CaCO3)			250	245	98	0.3	0.3	0	50.0	49.0	98
QC Batch 103794												
Nitrite + Nitrate	(mg/L N)	<DL	0.01	1.00	0.95	95	0.05	0.05	0	1.00	0.81	81

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue
Baton Rouge, LA
70820-7402

(225) 769-4900 • Fax (225) 767-5717

CHAIN OF CUSTODY RECORD

Lab use only	Client Name	Client #	Group #	Due Date
	Woodward Clyde	0463	99037145	6/11/99

Report to:
Client: URS Greiner Woodward Clyde
Address: ONeal Lane
Baton Rouge
Contact: Dennis Reese
Phone:
Fax:

Bill to:
Client:
Address:
Contact:
Phone:
Fax:

P.O. Number:

Project Name/Number: EDC InSitu Bioremediation / 350000915300

Sampled By: Dave Eddington

Analytical Requests & Method: TOC, TKN, Nitrate/Nitrite, Alkalinity, Ammonia, Phosphate

Lab use only:
Custody Seal used ☐ yes ☐ no
in tact ☐ yes ☐ no
Temperature °C 3

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	TOC	TKN	Nitrate/Nitrite	Alkalinity	Ammonia	Phosphate	Remarks	Lab ID
H2O	6-3-99	1240		✓	EDC-17	see table	6	✓	✓	✓	✓	✓	✓		6/4-42
H2O	6-3-99	1520		✓	EDC-11	↓	5	✓	✓	✓	✓	✓	✓		-49

Turn Around Time: ☐ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Fed Ex - LR	6-3-99	1900
Fed Ex	[signature]	6-4-99	0930

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

[1] Matrix: W = water, S = soil, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

BATTS PRINTING, LLC

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

CAL-06 11/98

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/21/1999

GCAL REPORT NO: 9904128

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906180041	WATER	EDC-11	06/17/1999 14:45	06/18/1999 09:10
9906180042	WATER	EDC-17	06/17/1999 12:15	06/18/1999 09:10

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906180041	WATER	EDC-11	06/17/1999 14:45	06/18/1999 09:10

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/18/1999 15:00

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Nitrate	9.60	(mg/L N)	0.1	10	103895	bmc

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906180042	WATER	EDC-17	06/17/1999 12:15	06/18/1999 09:10

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/18/1999 15:00

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Nitrate	96.0	(mg/L N)	1	100	103895	bmc

QUALITY CONTROL SUMMARY

Report#: 9904128

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 103895												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.94	94	0.34	0.38	11	1.00	0.94	94

GULF COAST ANALYTICAL LABORATORIES, INC.
7979 GSRI Avenue
Baton Rouge, LA
70820-7402
(225) 769-4900 • Fax (225) 767-5717

CHAIN OF CUSTODY RECORD

Lab use only	Client Name	Client #	Group #	Due Date
	UWWC	463	9904128	6-25-99

Report to:
Client: URSG Wodward Clyde
Address: ONeal Ln.
B.R., LA
Contact: Dennis Reece
Phone: 800-697-0103
Fax:

Bill to:
Client: Same
Address:
Contact:
Phone:
Fax:

Lab use only:
Custody Seal
used ☐ yes ☑ no
in tact ☐ yes ☐ no
Temperature °C 4

P.O. Number:
Project Name/Number: EDC 1
Sampled By:

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	Nitrate	Remarks	Lab ID
										618
H2O	6-17	1445		✓	EDC-11		1	✓		-41
↓	↓	1215		✓	EDC-17		1	✓		-42

Turn Around Time: ☐ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Federal Express	6-17-99	1945
Fed. Ex. #813412456	Dalla Hayde	6-18-99	0910

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = soil, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

BATTS PRINTING, LLC

GCAL-06 11/98

GULF COAST
ANALYTICAL LABORATORIES, INC.

File
EDCC/LSB
3800009153 00
Analytical Results

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 06/30/1999

GCAL REPORT NO: 9904281

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906250004	WATER	EDC-11	06/24/1999 14:55	06/25/1999 09:20
9906250005	WATER	EDC-17	06/24/1999 11:50	06/25/1999 09:20

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906250004	WATER	EDC-11	06/24/1999 14:55	06/25/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/25/1999 17:15
Total Kjeldahl Nitrogen	4500-NH3 BE	06/28/1999 08:00	06/30/1999 12:20
Total Organic Carbon	5310 B		06/28/1999 15:01

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	27.8	(mg/L C)	1	1	104425	jdt
Total Kjeldahl Nitrogen	6.7	(mg/L N)	1	1	104587	jar
Nitrate	9.0	(mg/L N)	0.1	10	104393	jeb

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9906250005	WATER	EDC-17	06/24/1999 11:50	06/25/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		06/25/1999 17:15
Total Kjeldahl Nitrogen	4500-NH3 BE	06/28/1999 08:00	06/30/1999 12:20
Total Organic Carbon	5310 B		06/28/1999 15:01

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	4.3	(mg/L C)	1	1	104425	jdt
Total Kjeldahl Nitrogen	<DL	(mg/L N)	1	1	104587	jar
Nitrate	88.0	(mg/L N)	1	100	104393	jeb

QUALITY CONTROL SUMMARY

Report#: 9904281

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 104393												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.97	97	0.77	0.76	1	1.00	0.86	86
QC Batch 104425												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	49.8	100	9.0	10.3	13	50.0	52.8	106
QC Batch 104587												
Total Kjeldahl Nitrogen	(mg/L N)	<DL	1	15.0	14.0	93	<DL	<DL		15.0	14.3	95

GULF COAST ANALYTICAL LABORATORIES, INC.
7979 GSRI Avenue
Baton Rouge, LA
70820-7402
(225) 769-4900 • Fax (225) 767-5717

CHAIN OF CUSTODY RECORD

Lab use only

Client Name	Client #	Group #	Due Date
Woodward Clyde	0463	9904281	7/2/99

Report to:
Client: URSGWC
Address: ONeal Ln.
Baton Rouge LA
Contact: Dennis Reece
Phone: 800 697 0103
Fax:

Bill to:
Client: Same
Address:
Contact:
Phone:
Fax:

Lab use only:
Custody Seal
used ☐ yes ☐ no
in tact ☐ yes ☐ no
Temperature °C 3

P.O. Number

Project Name/Number EDC In Situ Bioremediation / 35000915300

Sampled By: Dave Eddington

Analytical Requests & Method

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	Nitrate	TKN	TOC	Remarks	Lab ID 6/25
H_2O	624	1455		✓	EDC-11	See table	3	✓	✓	✓		-4
↓	↓	1150 ~~1455~~		✓	EDC-17	↓	↓	✓	✓	✓		-5

Turn Around Time: ☐ 24-48 hrs. ☐ 3 days ☐ 1 week ☑ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Fed Ex	6-24-99	1945
FedEx # 813412459753	[signature]	6/25/99	0920

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

[1] Matrix: W = water, S = soil, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 07/19/1999

GCAL REPORT NO: 9904580

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907090014	WATER	EDC-11	07/08/1999 14:20	07/09/1999 09:20
9907090015	WATER	EDC-17	07/08/1999 11:20	07/09/1999 09:20

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907090014	WATER	EDC-11	07/08/1999 14:20	07/09/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		07/09/1999 11:20
Total Organic Carbon	5310 B		07/12/1999 18:01

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	24.5	(mg/L C)	1	1	105073	ktf
Nitrate	9.1	(mg/L N)	0.1	10	105004	jeb

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907090015	WATER	EDC-17	07/08/1999 11:20	07/09/1999 09:20

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		07/09/1999 11:20
Total Alkalinity	SM2320 B		07/16/1999 11:00
Total Organic Carbon	5310 B		07/15/1999 05:01

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	4.2	(mg/L C)	1	1	105181	ktf
Total Alkalinity	70	(mg/L CaCO3)	1	1	105222	ktf
Nitrate	66.9	(mg/L N)	1	100	105004	jeb

QUALITY CONTROL SUMMARY

Report#: 9904580

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 105004												
Nitrate	(mg/L N)	<DL	0.01	1.00	1.09	109	9.1	9.2	1	10.0	10.3	103
QC Batch 105073												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	51.6	103	<DL	<DL		50.0	55.4	111
QC Batch 105181												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	50.7	101	4.2	4.6	9	50.0	56.9	114
QC Batch 105222												
Total Alkalinity	(mg/L CaCO3)			250	245	98	70	68	3	50	50	100

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue
Baton Rouge, LA
70820-7402

(225) 769-4900 • Fax (225) 767-5717

CHAIN OF CUSTODY RECORD

Lab use only	Client Name	Client #	Group #	Due Date
	Woodward Clyde	463	9904580	7/16/99

Report to:
Client: URSGWC
Address: ONeal Ln.
BR, LA
Contact: Dennis Reece
Phone: 800 697 0103
Fax:

Bill to:
Client: Same
Address:
Contact:
Phone:
Fax:

P.O. Number:

Project Name/Number: EDC Insitu Bioremediation/35000c9153.00

Sampled By: D. Eddington

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	TOC	Nitrate	Alkalinity	Lab ID
H_2O	7-8	1420		✓	EDC-11	see table	2	✓	✓		7/9-14
↓	↓	1120		✓	EDC-17	↓	2	✓	✓	✓	-15

Analytical Requests & Method

Lab use only:
Custody Seal used ☐ yes ☑ no
in tact ☐ yes ☐ no
Temperature °C 5

Remarks:

Turn Around Time: ☐ 24-48 hrs. ☐ 3 days ☐ 1 week ☑ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
	FedEx	7-8-99	1930
Relinquished by: (Signature) FedEx #813430471532	Received by: (Signature) David Hayden	Date: 7-9-99	Time: 0920
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = soil, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5...

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

BATTS PRINTING, LLC

GCAL-06 11/98

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 07/30/1999

GCAL REPORT NO: 9904945

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907260003	WATER	MW-11	07/23/1999 15:15	07/24/1999 08:30
9907260004	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907260003	WATER	MW-11	07/23/1999 15:15	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		07/25/1999 09:00

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Nitrate	7.80	(mg/L N)	0.1	10	105645	bmc

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9907260004	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		07/25/1999 09:00
Total Alkalinity	SM2320 B		07/28/1999 10:30

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Alkalinity	35	(mg/L CaCO3)	1	1	105727	ktf
Nitrate	98.0	(mg/L N)	1	100	105645	bmc

QUALITY CONTROL SUMMARY

Report#: 9904945

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 105645												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.95	95	98.0	95.0	3	100	106	106
QC Batch 105727												
Total Alkalinity	(mg/L CaCO3)			250	245	98	336	334	1	50	46	92

Gulf Coast Labs

WWC1463/9904945 | Due 8-2-99

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: URS Greiner Woodward Clyde
Project Reference: EDC In Situ Bioremed.
Project Manager: Dennis Reece
Sampled By: Dave Eddington

PO No.

AIC No	Sample Identification	Date/Time Collected	GRAB	COMP	SAMPLE MATRIX: WATER	SOIL		NO OF BOTTLES	ANALYSES REQUESTED: Nitrate	Alkalinity	Special (see Ed)
	MW-11	7-23 1515	✓		✓			1	✓		
	MW-17	↓ 1200	✓		✓			5	✓	✓	✓
		Container Type									
		Preservative									

AIC CONTROL NO:
AIC PROPOSAL NO:
Carrier:
Received on Ice (4 C)? YES NO
Remarks
990726-3
-4
Field pH calibration on _____ @ _____
Buffer:

Symbol references: G = Glass, P = Plastic, V = VOA vials, T = Sodium Thiosulfate
NO = none, S = Sulfuric acid pH2, N = Nitric acid pH2, B = NaOH to pH12, Z = Zinc acetate

Turnaround Time Requested: (Please circle)
NORMAL or EXPEDITED IN ___ DAYS
Expedited results requested by: _____
Who should AIC contact with questions: Dennis Reece
Phone: 800 697 0103 Fax: _____
Report Attention to: Dennis Reece
Report Address to: O'Neal Ln
Baton Rouge LA

Relinquished By:	Date/Time	Received By:	Date/Time
	7-23/1845		7-23
Relinquished By:	Date/Time	Received in Lab By:	Date/Time
	7-23 0830		

Comments:
4°C

GULF COAST
ANALYTICAL LABORATORIES, INC.

File 3500009153
El Dorado Chemical / LSB

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 08/10/1999

GCAL REPORT NO: 9905109

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908020027	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

CASE NARRATIVE

Client: WOODWARD CLYDE/BR **Group No:** 9905109
Date: 08/10/1999

INORGANIC QUALITY CONTROL CRITERIA:

Holding Times: The Nitrate sample was analyzed out of holding time as per client request.

All other holding times were within method criteria.

Method Blanks: All method blanks were found to be within quality control criteria.

Spike/Duplicate (S/D): The RPD for duplicate Nitrate analysis is above the control limit; however, this RPD is not applicable because the batch duplicate sample concentration is less than five times the detection limit.

All other S/D recoveries were within quality control criteria.

Laboratory Control Samples: All LCS analyses met quality control criteria.

Calibration Verifications: All ICV, ICB, CCV, CCB analyses met all quality control criteria.

Analysis Comments: No other unusual analytical problems were encountered during the analysis of these samples.

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

Scott Bailey

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908020027	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/03/1999 15:15
Total Organic Carbon	5310 B		08/06/1999 19:17

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	53.0	(mg/L C)	1	1	106138	ktf
Nitrate	0.02	(mg/L N)	0.01	1	106035	bmc

QUALITY CONTROL SUMMARY

Report#: 9905109

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 106035												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.94	94	0.02	0.01	67 *	1.00	1.04	104
QC Batch 106138												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	46.7	93	53.0	51.0	4	50.0	47.0	94

*Outside QC Limits - See Narrative

Gulf Coast Labs WWC|463|990514|Due 8-9-99

AMERICAN INTERPLEX CORPORATION LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: URS Greiner Woodward Clyde

Project Reference: EDC In Situ Bioremed.

Project Manager: Dennis Reece

Sampled By: Dave Eddington

PO No.:

AIC CONTROL NO:

AIC PROPOSAL NO:

Carrier:

Received on Ice (4 C)? YES NO

ANALYSES REQUESTED: Nitrate; ~~Alkalinity~~; Special (see Ed); analyze TOC + NO3 - OK out of hold time; OK not refrigerated JL 8/12/99

AIC No	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	NO OF BOTTLES	Nitrate	~~Alkalinity~~	Special (see Ed)								Remarks
	MW-11	7-23 1515	✓		✓		1	✓										
	MW-17	↓ 1200	✓		✓		5	✓	~~✓~~	✓								990802-27
																		Field pH calibration
		Container Type																on ______ @ ______
		Preservative																Buffer:

Symbol references: G = Glass; P = Plastic; V = VOA vials; T = Sodium Thiosulfate; NO = none; S = Sulfuric acid pH2; N = Nitric acid pH2; B = NaOH to pH12; Z = Zinc acetate

Turnaround Time Requested: (Please circle) (NORMAL) or EXPEDITED IN ____ DAYS

Expedited results requested by: ____________

Who should AIC contact with questions: Dennis Reece

Phone: 800 697 0103 Fax:

Report Attention to: Dennis Reece

Report Address to: ONeal Ln
Baton Rouge LA

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7-23/1845	[signature]	7-23
Fed X	~~7-23~~ 24 0830	Received in Lab By: Jody Grey	

Comments:

4/99

FORM 0060

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 08/25/1999

GCAL REPORT NO: 9905288

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908090061	WATER	EDC-11	08/06/1999 14:50	08/07/1999 11:30
9908090062	WATER	EDC-17	08/06/1999 12:10	08/07/1999 11:30

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

Scott Bailey

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908090061	WATER	EDC-11	08/06/1999 14:50	08/07/1999 11:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/07/1999 19:00
Total Kjeldahl Nitrogen	4500-NH3 BE	08/13/1999 12:00	08/16/1999 08:20
Total Organic Carbon	5310 B		08/10/1999 12:50

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	40.8	(mg/L C)	1	1	106257	ktf
Nitrate	9.40	(mg/L N)	0.1	10	106213	jeb
Total Kjeldahl Nitrogen	5.9	(mg/L N)	1	1	106448	ktf

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908090062	WATER	EDC-17	08/06/1999 12:10	08/07/1999 11:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/07/1999 19:00
Total Alkalinity	SM2320 B		08/10/1999 14:25
Total Kjeldahl Nitrogen	4500-NH3 BE	08/13/1999 12:00	08/16/1999 08:20
Total Organic Carbon	5310 B		08/10/1999 12:50

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	4.0	(mg/L C)	1	1	106257	ktf
Total Alkalinity	37	(mg/L CaCO3)	1	1	106258	ktf
Nitrate	73.0	(mg/L N)	1	100	106213	jeb
Total Kjeldahl Nitrogen	<DL	(mg/L N)	1	1	106448	ktf

QUALITY CONTROL SUMMARY

Report#: 9905288

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 106213												
Nitrate	(mg/L N)	<DL	0.01	1.00	1.03	103	9.40	8.80	7	NA	NA	
QC Batch 106257												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	54.0	108	<DL	<DL		50.0	60.9	122
QC Batch 106258												
Total Alkalinity	(mg/L CaCO3)			250	250	100	37	35	6	50	53	106
QC Batch 106448												
Total Kjeldahl Nitrogen	(mg/L N)	<DL	1	15.0	14.0	93	<DL	<DL		15.0	14.0	93

GULF COAST CARB WWC1463/9905288 Due 8-16-99 Serial Number 119200

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 Fax: (912) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (904) 878-3994 Fax: (904) 878-9504
414 SW 12th Avenue, Deerfield Beach, FL 33442 Phone: (954) 421-7400 Fax: (954) 421-2584
900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049
100 Alpha Drive, Suite 110, Destrehan, LA 70047 Phone: (504) 764-1100 Fax: (504) 725-1163

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Task

PROJECT REFERENCE	PROJECT NO	~~PO~~ NUMBER
~~URSGWC~~ Biorem.	350000915300	000001

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
AR	Dave Eddington	800 6970103	

CLIENT NAME	CLIENT PROJECT MANAGER
URSGWC	Dennis Reese

CLIENT ADDRESS (CITY, STATE, ZIP): Baton Rouge, LA

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (oil, solvent, etc)

REQUIRED ANALYSES: TOC / TKN / Nitrate / Alkalinity / Special

PAGE 1 OF 1

STANDARD REPORT DELIVERY ✓

EXPEDITED REPORT DELIVERY (surcharge)

Date Due

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED						REMARKS
8-6	1450		EDC-11	✓				✓	✓	✓			990809-61	Dennis Reece will call for instruction for Special 1-gal. sample
↓	1210		EDC-17	✓				✓	✓	✓	✓	✓	-62	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME
	8/24/99	1600		8-6	1940		8/7/99	11:30
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
	8/9/99	0830	Fed Ex	8-6	1940		8/7/99	11:30

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
	8-9-99	0845	☐ YES ☐ NO			

ORIGINAL

GULF COAST
ANALYTICAL LABORATORIES, INC.

File 350000915300
El Dorado Chemical/LSB

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 08/16/1999

GCAL REPORT NO: 9905277

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908090003	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

CASE NARRATIVE

Client: WOODWARD CLYDE/BR **Group No:** 9905277
Date: 08/16/1999

INORGANIC QUALITY CONTROL CRITERIA:

Holding Times: The Nitrate analysis was analyzed out of holding time as per client request.

All other holding times were within method criteria.

Method Blanks: All method blanks were found to be within quality control criteria.

Spike/Duplicate (S/D): The RPD for duplicate Nitrate analysis is above the control limit; however, this RPD is not applicable because the batch duplicate sample concentration is less than five times the detection limit.

All other S/D recoveries were within quality control criteria.

Laboratory Control Samples: All LCS analyses met quality control criteria.

Calibration Verifications: All ICV, ICB, CCV, CCB analyses met all quality control criteria.

Analysis Comments: No other unusual analytical problems were encountered during the analysis of these samples.

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

Scott Bailey

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908090003	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/11/1999 09:30
Total Organic Carbon	5310 B		08/13/1999 17:32

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	42.0	(mg/L C)	1	1	106438	jdt
Nitrate	0.04	(mg/L N)	0.01	1	106266	jdt

QUALITY CONTROL SUMMARY

Report#: 9905277

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 106266												
Nitrate	(mg/L N)	<DL	0.01	1.00	1.05	105	0.04	0.02	67 *	1.00	1.06	106
QC Batch 106438												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	48.9	98	<DL	<DL		50.0	52.5	105

*Outside QC Limits - See Narrative

Gulf Coast Labs

WUC/463/99052771/Due 8-16-99

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: URS Greiner Woodward Clyde
Project Reference: EDC In Situ Bioremed.
Project Manager: Dennis Reece
Sampled By: Dave Eddington

PO No.

AIC No	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	NO OF BOTTLES	Nitrate	Alkalinity TOC	Special (see Ed)
	MW-11	7-23 1515	✓		✓		1	✓		
	MW-17	↓ 1200	✓		✓		5	✓	✓	✓
		Container Type								
		Preservative								

ANALYSES REQUESTED

AIC CONTROL NO:
AIC PROPOSAL NO:
Carrier:
Received on Ice (4 C)? YES NO
Remarks
990809-3
Field pH calibration
on _____ @ _____
Buffer:

Symbol references: G = Glass P = Plastic V = VOA vials T = Sodium Thiosulfate
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate

Turnaround Time Requested: (Please circle)
NORMAL or EXPEDITED IN ___ DAYS
Expedited results requested by: _____
Who should AIC contact with questions: Dennis Reece
Phone: 800 697 0103 Fax: _____
Report Attention to: Dennis Reece
Report Address to: ONeal Ln
Baton Rouge LA

Relinquished By:	Date/Time	Received By:	Date/Time
	7-23/1845		7-23
Relinquished By: Fed Ex	Date/Time 7-23 0830 24	Received in Lab By: Jodey Grey	Date/Time

Comments: Room Temp.

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 08/19/1999

GCAL REPORT NO: 9905431

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908160018	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

CASE NARRATIVE

Client: WOODWARD CLYDE/BR **Group No:** 9905431
Date: 08/19/1999

INORGANIC QUALITY CONTROL CRITERIA:

Holding Times: The Nitrate sample was added and analyzed out of hold time as requested by the client.

All other holding times were within method criteria.

Method Blanks: All method blanks were found to be within quality control criteria.

Spike/Duplicate (S/D): All S/D recoveries were within quality control criteria.

Laboratory Control Samples: All LCS analyses met quality control criteria.

Calibration Verifications: All ICV, ICB, CCV, CCB analyses met all quality control criteria.

Analysis Comments: No other unusual analytical problems were encountered during the analysis of these samples.

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

Scott Bailey

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908160018	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/16/1999 08:55
Total Organic Carbon	5310 B		08/18/1999 20:52

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	52.0	(mg/L C)	1	1	106603	ktf
Nitrate	0.03	(mg/L N)	0.01	1	106462	bmc

QUALITY CONTROL SUMMARY

Report#: 9905431

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 106462												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.96	96	0.03	0.03	0	1.00	0.99	99
QC Batch 106603												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	48.8	98	3.0	3.0	0	50.0	55.7	111

Gulf Coast Labs

AMERICAN INTERPLEX CORPORATION LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

Woodward Clyde / 04163 / 9905431 / Due 8/23/99

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: URS Greiner Woodward Clyde
Project Reference: EDC In Situ Bioremed.
Project Manager: Dennis Reece
Sampled By: Dave Eddington

PO No.

SAMPLE MATRIX: WATER, SOIL

NO OF BOTTLES

ANALYSES REQUESTED: Nitrate; ~~Alkalinity~~ TOC; Special (See Ed) analyze TOC & NO_3 sample out of hold time - not refrigerated JL 8/17/99

AIC CONTROL NO:
AIC PROPOSAL NO:
Carrier:
Received on Ice (4 C)? YES NO

AIC No	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	NO OF BOTTLES	Nitrate	~~Alkalinity~~ TOC	Special (See Ed)	Remarks
	MW-11	7-23 1515	✓		✓		1	✓			- 18
	MW-17	↓ 1200	✓		✓		5	✓	✓	✓	↓ rush
		Container Type									
		Preservative									

Field pH calibration
on _____ @ _____
Buffer:

Symbol references: G = Glass; P = Plastic; V = VOA vials; T = Sodium Thiosulfate
NO = none; S = Sulfuric acid pH2; N = Nitric acid pH2; B = NaOH to pH12; Z = Zinc acetate

Turnaround Time Requested: (Please circle)
NORMAL or EXPEDITED IN ___ DAYS
Expedited results requested by: _____
Who should AIC contact with questions: Dennis Reece
Phone: 800 697 0103 Fax: _____
Report Attention to: Dennis Reece
Report Address to: ONeal Ln
Baton Rouge LA

Relinquished By:	Date/Time	Received By:	Date/Time
	7-23 1845		7-23
Relinquished By: Fed Ex	Date/Time 7-23 0830	Received in Lab By:	Date/Time

Comments: 24

4/99

FORM 0060

GULF COAST
ANALYTICAL LABORATORIES, INC.

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

REPORT DATE: 08/25/1999

GCAL REPORT NO: 9905600

DELIVER TO	WOODWARD CLYDE/BR
	WOODWARD CLYDE CONSULTANTS
	2882 ONEAL LANE
	BATON ROUGE, LA 70816
ATTENTION	DENNIS REECE
CLIENT ID	0463

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402 • Phone (225) 769-4900 • Fax (225) 767-5717
Email: gcal@premier.net

SAMPLE CROSS-REFERENCE

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908230013	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

CASE NARRATIVE

Client: WOODWARD CLYDE/BR **Group No:** 9905600
Date: 08/25/1999

INORGANIC QUALITY CONTROL CRITERIA:

Holding Times: The Nitrate was analyzed out of hold time as per the client request.

All other holding times were within method criteria.

Method Blanks: All method blanks were found to be within quality control criteria.

Spike/Duplicate (S/D): All S/D recoveries were within quality control criteria.

Laboratory Control Samples: All LCS analyses met quality control criteria.

Calibration Verifications: All ICV, ICB, CCV, CCB analyses met all quality control criteria.

Analysis Comments: No other unusual analytical problems were encountered during the analysis of these samples.

LABORATORY ENDORSEMENT

Sample receipt at Gulf Coast Analytical Laboratories, Inc. is documented for your designated sample(s). Chain-of-custody documentation, if provided, is included in this report.

Sample analysis was performed in accordance with Environmental Protection Agency protocol or other approved methods as designated in this report. All Quality Control criteria were found to be within Method Control Limits unless otherwise noted in the Case Narrative of this report. All results reported are to be considered Wet Weight Results unless dry weight determinations are made and the Case Narrative includes a statement that results are reported on a Dry Weight Basis.

REPORT QUALIFIERS

<DL	RESULT IS LESS THAN THE DETECTION LIMIT
DO	PARAMETER WAS DILUTED OUT
fld **	PARAMETER WAS PERFORMED IN THE FIELD
MI	MATRIX INTERFERENCE
NA	NOT APPLICABLE
ND	NOT DETECTED
subc **	ANALYSIS WAS SUBCONTRACTED
TNTC	TOO NUMEROUS TO COUNT
00:00	TIME NOT PROVIDED OR MIDNIGHT

** These fields will appear in the analyst column

ISO GUIDE 25 DECLARATION

Gulf Coast Analytical Laboratories, Inc. is certified by The American Association For Laboratory Accreditation (A2LA). This certification ensures compliance with the laboratory standards outlined in ISO Guide 25. In accordance with ISO Guide 25, this report shall be reproduced only in full, and with the written permission of Gulf Coast Analytical Laboratories, Inc. The results herein relate only to the sample(s) tested. Documented results are shown on the following page(s).

We appreciate this opportunity to provide you with this analytical service. If we can be of further assistance, please do not hesitate to contact us at (225)769-4900.

Scott Bailey

SCOTT A. BAILEY
OPERATIONS MANAGER

This Report Contains 7 Pages.

SAMPLE ANALYSIS

SAMPLE IDENTIFICATION

Sample#	Matrix	Sample ID	Sample Date	Receive Date
9908230013	WATER	MW-17	07/23/1999 12:00	07/24/1999 08:30

METHOD SUMMARY

Test	Method	Prep Date	Analysis Date
Nitrate	EPA353.2-NO3		08/23/1999 09:40
Total Organic Carbon	5310 B		08/25/1999 03:18

ANALYTICAL RESULTS

Miscellaneous Analyses	Result	Unit	Detection Limit	Dilution	QC Batch	By
Total Organic Carbon	255	(mg/L C)	1	1	106830	jdt
Nitrate	0.31	(mg/L N)	0.01	1	106751	bmc

QUALITY CONTROL SUMMARY

Report#: 9905600

Parameter	Units	METHOD BLANK		LABORATORY CONTROL STANDARD			DUPLICATE			SPIKE		
		Result	Detection Limit	Spiked Amount	Recovered Amount	Percent Recovery	Result 1	Result 2	RPD	Spiked Amount	Recovered Amount	Percent Recovery
QC Batch 106751												
Nitrate	(mg/L N)	<DL	0.01	1.00	0.95	95	0.31	0.29	7	1.00	0.84	84
QC Batch 106830												
Total Organic Carbon	(mg/L C)	<DL	1	50.0	51.6	103	16.2	15.9	2	50.0	47.4	95

Gulf Coast Labs WWC/463/99050600 / Due 8-30-99

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060
FAX (501) 224-5072

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client: URS Greiner Woodward Clyde
Project Reference: EDC In Situ Bioremed.
Project Manager: Dennis Reece
Sampled By: Dave Eddington

PO No.

SAMPLE MATRIX: W A T E R; S O I L

NO OF BOTTLES

ANALYSES REQUESTED: Nitrate; ~~Alkalinity~~ TOC; Special (see Ed) analyze NO3 & TOC on MW-17 DK out of hold time JL 8/31/99

AIC CONTROL NO:
AIC PROPOSAL NO:
Carrier:
Received on Ice (4 C)? YES NO
Remarks

AIC No	Sample Identification	Date/Time Collected	GRAB	COMP	WATER	SOIL	NO OF BOTTLES	Nitrate	~~Alkalinity~~ TOC	Special (see Ed)	Remarks
	MW-11	7-23 1515	✓		✓		1	✓			
	MW-17	↓ 1200	✓		✓		5	✓	✓	✓	990823-13
		Container Type									Field pH calibration
		Preservative									on _____ @ _____ Buffer:

Symbol references: G = Glass P = Plastic V = VOA vials T = Sodium Thiosulfate
NO = none S = Sulfuric acid pH2 N = Nitric acid pH2 B = NaOH to pH12 Z = Zinc acetate

Turnaround Time Requested: (Please circle)
NORMAL or EXPEDITED IN ___ DAYS
Expedited results requested by: _____
Who should AIC contact with questions: Dennis Reece
Phone: 800 697 0103 Fax: _____
Report Attention to: Dennis Reece
Report Address to: ONeal Ln
Baton Rouge LA

Relinquished By:	Date/Time	Received By:	Date/Time
	7-23 1845		7-23
Relinquished By: Fed Ex	Date/Time 7-23 0830 24	Received in Lab By: Jodey Gray	Date/Time

Comments: