Inspection

5.	REVIEW FACILITY RECORDS, REPORTS, SELF-MONITORING DATA CURRENTLY AVAILABLE.	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation: NONE IN NWRO FILES	
IF YES:	Info Source/Location/Date Reviewed	Inspector Notations Pertinent to Upcoming Inspection:

6.	REVIEW MAPS SHOWING FACILITY LAYOUT AND WASTE MANAGEMENT/ DISCHARGE SITES.	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation: NONE IN NWRO FILES	
IF YES:	Info Source/Location/Date Reviewed	Inspector Notations Pertinent to Upcoming Inspection:

7.	REVIEW RECORDS OF CITIZEN'S COMPLAINTS.	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation:	
IF YES:	Info Source/Location/Date Reviewed: NWRO FILES 12/22/06	Inspector Notations Pertinent to Upcoming Inspection: NONE

8.	REVIEW ANY PROCESS INFORMATION.	CHECK ONE: YES / NO (N/S) / N/A / N/E
IF NO, N/A, N/E:	Explanation:	
IF YES:	Info Source/Location/Date Reviewed: NWRO FILES 12/22/06	Inspector Notations Pertinent to Upcoming Inspection: NONE

9.	REVIEW AND DETERMINE APPLICABLE REQUIREMENTS.	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation: OBTAIN A COPY OF THE PERMIT DURING INSPECTION	
IF YES:	Info Source/Location/Date Reviewed	Inspector Notations Pertinent to Upcoming Inspection:

ANY ADDITIONAL COMMENTS:

Name and Location of Facility to be Inspected:	NPDES Permit #:	GPS Coordinates Recorded:	Date to be Inspected:	Inspector:
Name: BP Amoco wn/City: WHITING County: LAKE	IN0000108	YES	12/22/06	NKR

1.	REVIEW RELEVANT PROGRAM PERMIT AND PERMIT APPLICATIONS	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Provide explanation or description why: PERMIT COULD NOT BE LOCATED IN NWRO - OBTAIN DURING INSPECTION.	
IF YES:	Info Source/ Location/Date Reviewed	Inspector Notations Pertinent to Upcoming Inspection:

2.	REVIEW PRIOR INSPECTION HISTORY & REPORTS RELEVANT TO THE PROGRAM INSPECTION, PARTICULARLY ANY OUTSTANDING OR UNRESOLVED ISSUES.	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation:	
ES:	Info Source/Location/Date Reviewed NWRO FILES 12/22/06	Inspector Notations Pertinent to Upcoming Inspection: CLARITY PROBLEMS

3.	REVIEW PRIOR COMPLIANCE AND ENFORCEMENT HISTORY RELEVANT TO PROGRAM INSPECTION, PARTICULARLY: WARNINGS AND MINOR VIOLATIONS, FORMAL ACTIONS (OE &/OR EPA)	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, N/E:	Explanation:	
IF YES:	Info Source/Location/Date Reviewed NWRO FILES 12/22/06	Inspector Notations Pertinent to Upcoming Inspection: NONE

4.	REVIEW FACILITY RESPONSES TO ALL OF THE ABOVE	CHECK ONE: YES / NO / N/A / N/E
IF NO, N/A, E:	Explanation:	
YES:	Info Source/Location/Date Reviewed NWRO FILES 12/22/06	Inspector Notations Pertinent to Upcoming Inspection: NONE

Microbac Laboratories, Inc.

SEAWAY INDUSTRIAL DIVISION
542-544 Conkey Street
Hammond, IN. 46324-1153
(219) 932-1770

AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

CLIENT: Natalie Grimmer
Amoco Oil Company
P.O. Box 710
Whiting, IN. 46394

Date Reported: 8/22/94
Date Received: 8/19/94,18:15
Lab ID.: 13917
Page 1 of 1

Sample I.D. / Parameters / Date/Tech.	Result	MDL	Units	EPA Method	Test
13917: Outfall 001, 8/19/94 @ 14:45 by N.G.					
Reduction Potential	245.	NA	mV	*	8/19/94.CS
pH	7.4	NA	pH/units	150.1	8/19/94,CS

* Environmental Chemistry 4th Edition, Stanley E. Manahan, Brooks Cole Publishing 1984

Respectfully Submitted

Karen A. Ziolkowski
Laboratory Director

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INTERNAL QC		CUMULATIVE HEIGHT (UNCORRECTED)	CUMULATIVE HEIGHT (BACKGROUND)	CUMULATIVE HEIGHT (CORRECTED)	RF CORRECTED HEIGHT	RELATIVE AMOUNT (%)	TOTAL As (ug/L) UNCORRECTED	BACKGROUND	CORRECTED	SPIKE LEVEL (ug/L)	RECOVERY (%)
50 ug/L As+3 SPIKE											
3 A-B-0	As+3	196915	<20000	196915	2102	>98.4%	68	19	49	54	>89
	As+5	206057	215788	<20000	<35	<1.6%					
50 ug/L As+3 SPIKE											
6-B-0	As+3	108157	<20000	108157	1154	92.2%	69	17	52	54	>89
	As+5	235931	180449	55482	97	7.8%					
50 ug/L As+5 SPIKE											
4-B-0	As+3	<20000	—	<20000	<212	<15.5%	68	19	49		
	As+5	873768	215788	657980	1152	>84.5%				54	>77
50 ug/L As+5 SPIKE											
6-B-0	As+3	<20000	—	<20000	<212	<21.9%	62	17	45		
	As+5	613577	180449	433128	758	>78.1%				54	>65

		CUMULATIVE PEAK HEIGHT (uV)	RF (uV/ug/L)	MEAN RF (uV/ug/L)
STANDARDS				
500 ug/L As+3				
	As+3	52931	106	94
	As+5	—		
500 ug/L As+3				
	As+3	81510	82	
	As+5	—		
500 ug/L As+5				
	As+3	—		
	As+5	287695	575	571
500 ug/L As+5				
	As+3	—		
	As+5	268097	536	
500 ug/L As+5				
	As+3	—		
	As+5	301178	602	

EPL BIO-ANALYTICAL SERVICES, INC.
PROJECT NO. 251M01
CLIENT: AMOCO OIL COMPANY

ARSENIC SPECIATION ANALYSIS (HPLC/GFAA) OF WASTEWATER SAMPLES
ANALYSIS GROUP 1

SAMPLE ID	COMPOUND	CUMULATIVE PEAK HEIGHT (uV)	RF CORRECTED HEIGHT (uV)	RELATIVE AMOUNT (%)	TOTAL As (ug/L)	SPECIATED As (ug/L)
WASTEWATER						
1-B-0	As+3	<20000	<27	<24.5%	20	<4.9
	As+5	61549	83	>75.5%		>15.1
2-B-0	As+3	<20000	<27	<14.8%	19	<2.8
	As+5	114388	155	>85.2%		>16.2
2-B-1	As+3	<20000	<27	<18.5%	20	<3.7
	As+5	87768	119	>81.5%		>16.3
2-B-2	As+3	145382	686	59.0%	510	301
	As+5	352333	476	41.0%		209
2-B-3	As+3	<20000	<27	—	<5	—
	As+5	<20000	<94	—		—

INTERNAL QC		CUMULATIVE HEIGHT (UNCORRECTED)	CUMULATIVE HEIGHT (BACKGROUND)	CUMULATIVE HEIGHT (CORRECTED)	RF CORRECTED HEIGHT	RELATIVE AMOUNT (%)	TOTAL As (ug/L) UNCORRECTED	BACKGROUND	CORRECTED	SPIKE LEVEL (ug/L)	RECOVERY (%)
50 ug/L As+3 SPIKE											
1-B-0	As+3	120485	<20000	120485	569	>95.5%	72	20	52	50	>99
	As+5	67290	61549	<20000	<27	<4.5%					
50 ug/L As+5 SPIKE											
1-B-0	As+3	<20000	—	<20000	<94	<9.0%	68	20	48		
	As+5	765759	61549	704210	952	>91.0%				55	>79

		CUMULATIVE PEAK HEIGHT (uV)	RF (uV/ug/L)
STANDARDS			
1000 ug/L As+3			
	As+3	211932	212
	As+5	—	
750 ug/L As+5			
	As+3	—	
	As+5	503786	740
750 ug/L As+5			
	As+3	—	
	As+5	506304	

EPL BIO-ANALYTICAL SERVICES, INC.
PROJECT NO. 251M01
CLIENT: AMOCO OIL COMPANY

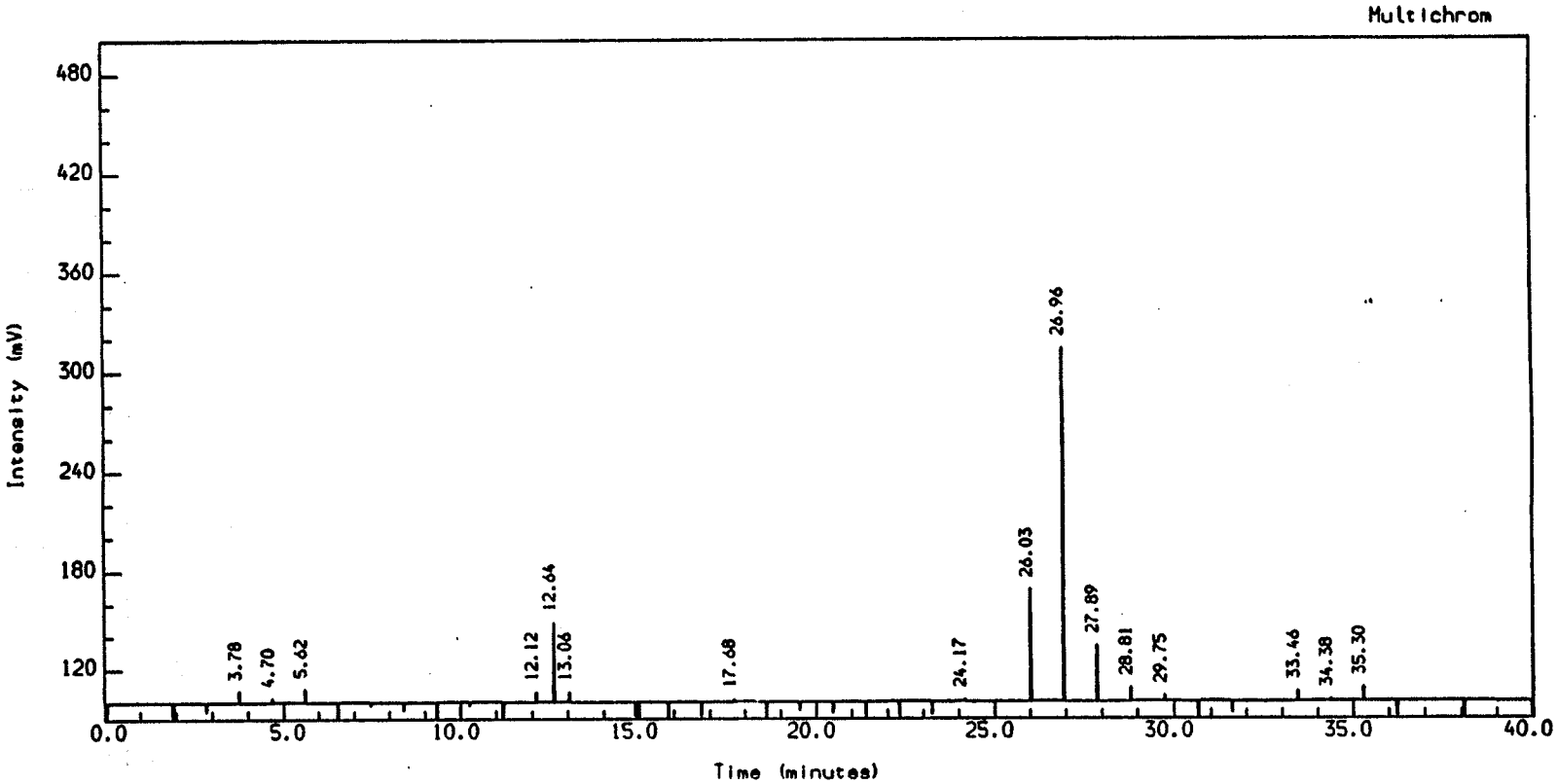
ARSENIC SPECIATION ANALYSIS (HPLC/GFAA) OF WASTEWATER SAMPLES
ANALYSIS GROUP 2

SAMPLE ID	COMPOUND	CUMULATIVE PEAK HEIGHT (uV)	RF CORRECTED HEIGHT (uV)	RELATIVE AMOUNT (%)	TOTAL As (ug/L)	SPECIATED As (ug/L)
WASTEWATER						
3-B-0	As+3	<20000	<212	<22.1%	18	<4.0
	As+5	427751	749	>77.9%		>14.0
4-B-0	As+3	<20000	<212	<35.9%	19	<6.8
	As+5	215788	378	>64.1%		>12.2
5-B-0	As+3	<20000	<212	<18.5%	11	<2.0
	As+5	166545	292	>81.5%		>9.0
5-B-1	As+3	<20000	<212	<47.2%	11	<5.2
	As+5	135363	237	>52.8%		>5.8
5-B-2	As+3	190859	2037	62.0%	620	384
	As+5	714834	1251	38.0%		236
5-B-3	As+3	<20000	<212	—	<5	—
	As+5	<20000	<94	—		—
6-B-0	As+3	<20000	<212	<40.2%	17	<6.8
	As+5	180449	316	>59.8%		>10.1
7-B-0	As+3	<20000	<212	<42.5%	16	<6.8
	As+5	163151	286	>57.4%		>9.2
7-B-1	As+3	<20000	<212	<54.6%	13	<7.1
	As+5	100640	176	>45.4%		>5.9
7-B-2	As+3	114178	1219	62.5%	450	281
	As+5	417548	731	37.5%		169
7-B-3	As+3	<20000	<212	—	<5	—
	As+5	<20000	<35	—		—

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7.6.1.

Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 21-JUN-1994 at 21:48

Reported on 26-JUL-1994 at 16:18

Method : 251M01-7

Calibration :

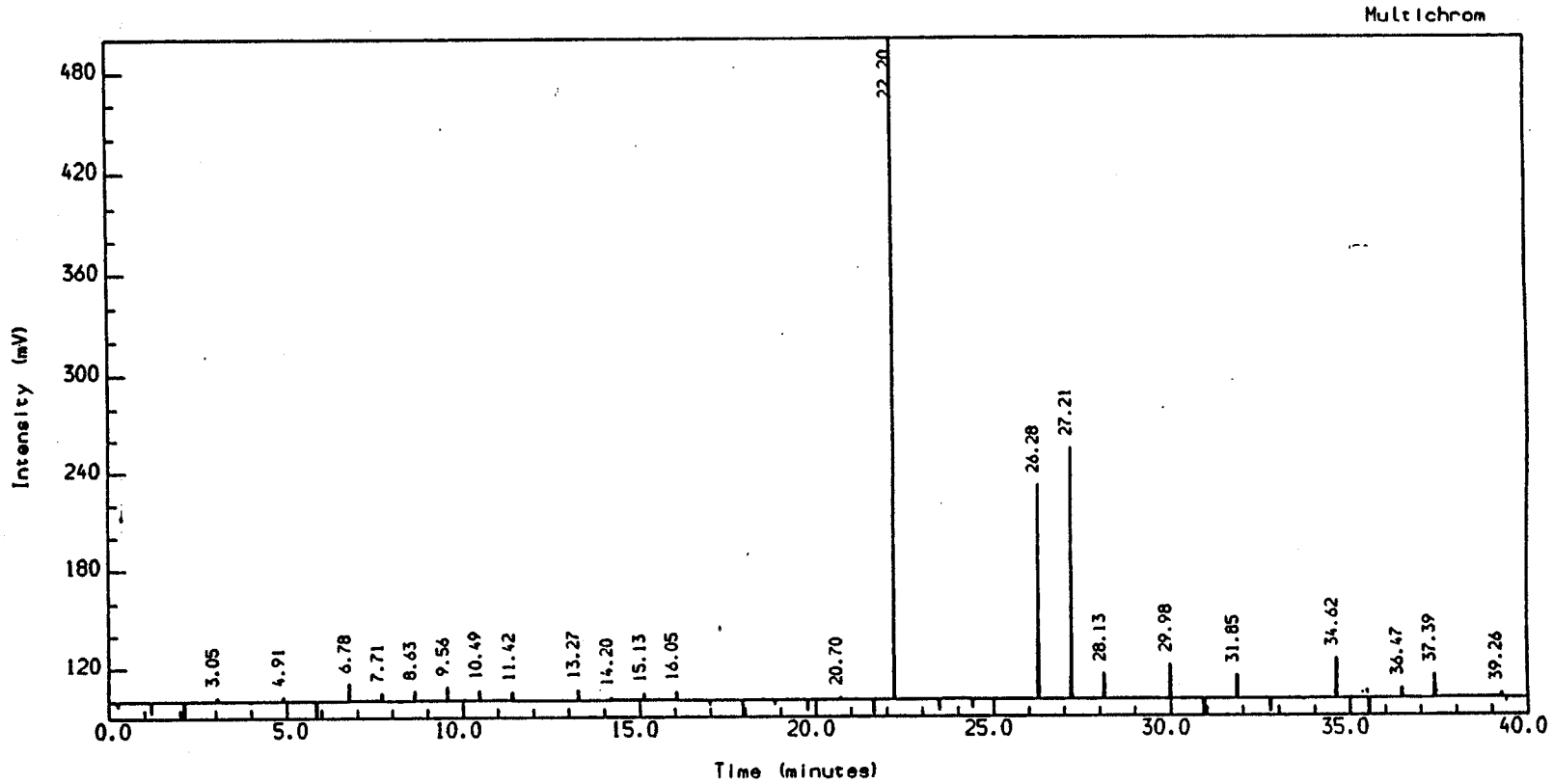
Run Sequence : 251M01-7

Analysis Group 2. As+5 Stand d, 500 ug/L As

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,5,1.

Amount : 1.000



Ana sis Group 2. As+5 Standa , 500 ug/L As

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 21-JUN-1994 at 21:03

Reported on 26-JUL-1994 at 16:18

Method : 251M01-7

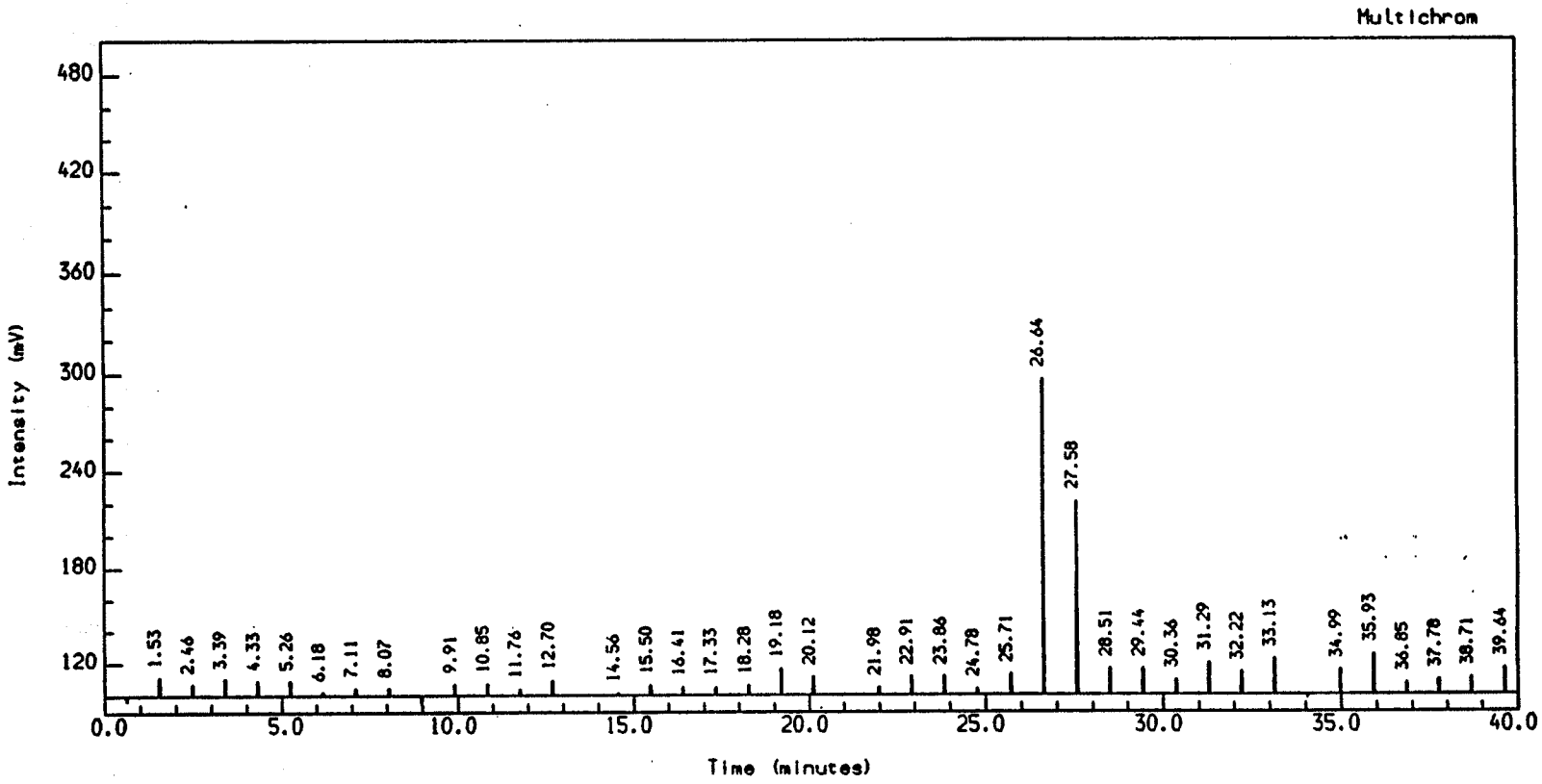
Calibration :

Run Sequence : 251M01-7

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,6,1.

Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-JUN-1994 at 19:11

Reported on 26-JUL-1994 at 16:17

Method : 251M01-6

Calibration :

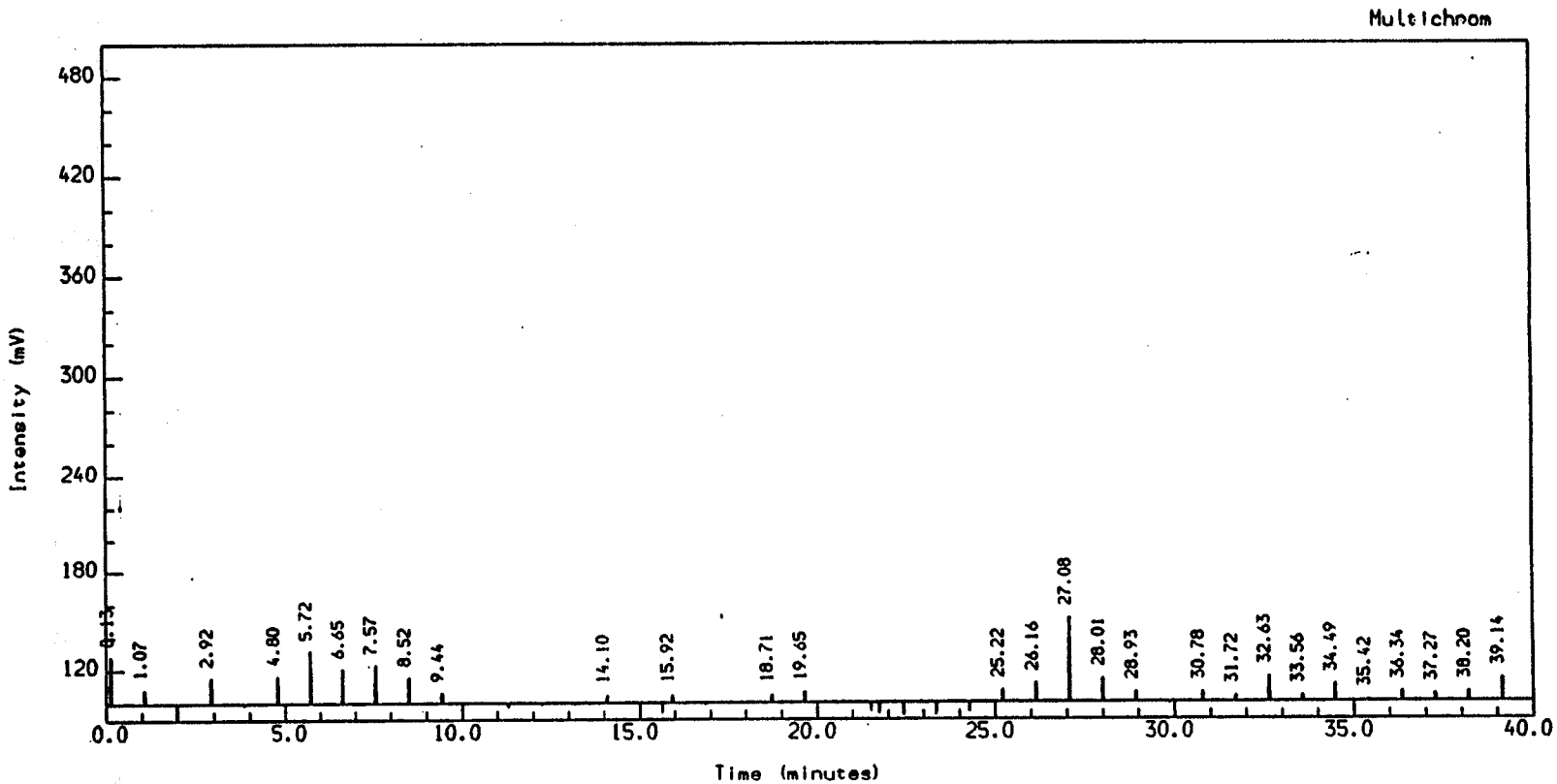
Run Sequence : 251M01-6

A lysis Group 2. As+5 Stan rd, 500 ug/L As

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,4,1.

Amount : 1.000



Analysis Group 2. As+3 Standard 500 ug/L As

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-JUN-1994 at 17:39

Reported on 26-JUL-1994 at 16:16

Method : 251M01-6

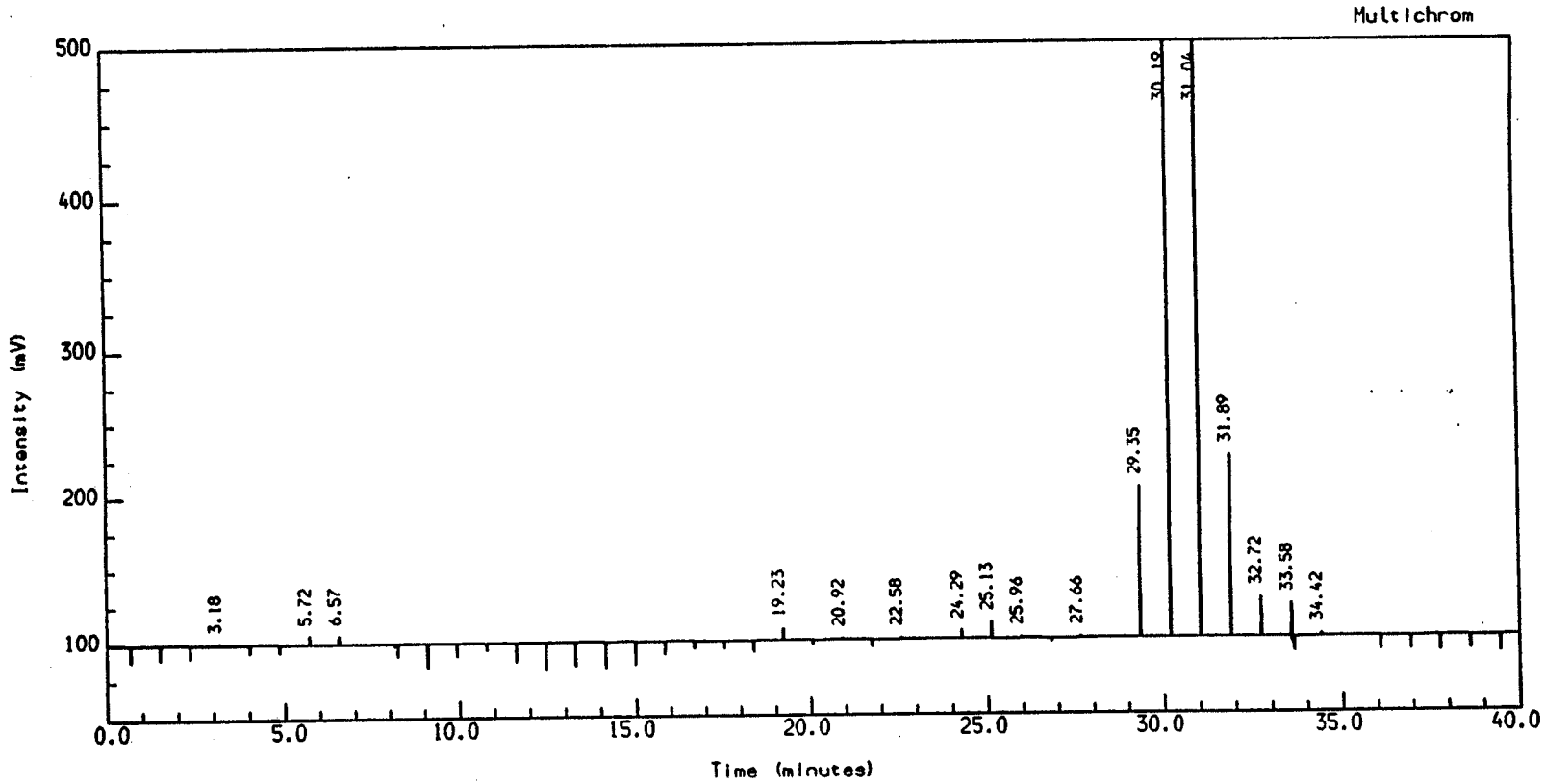
Calibration :

Run Sequence : 251M01-6

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-4,3,1.

Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 25-MAY-1994 at 17:51

Reported on 26-JUL-1994 at 16:15

Method : 251M01-4

Calibration :

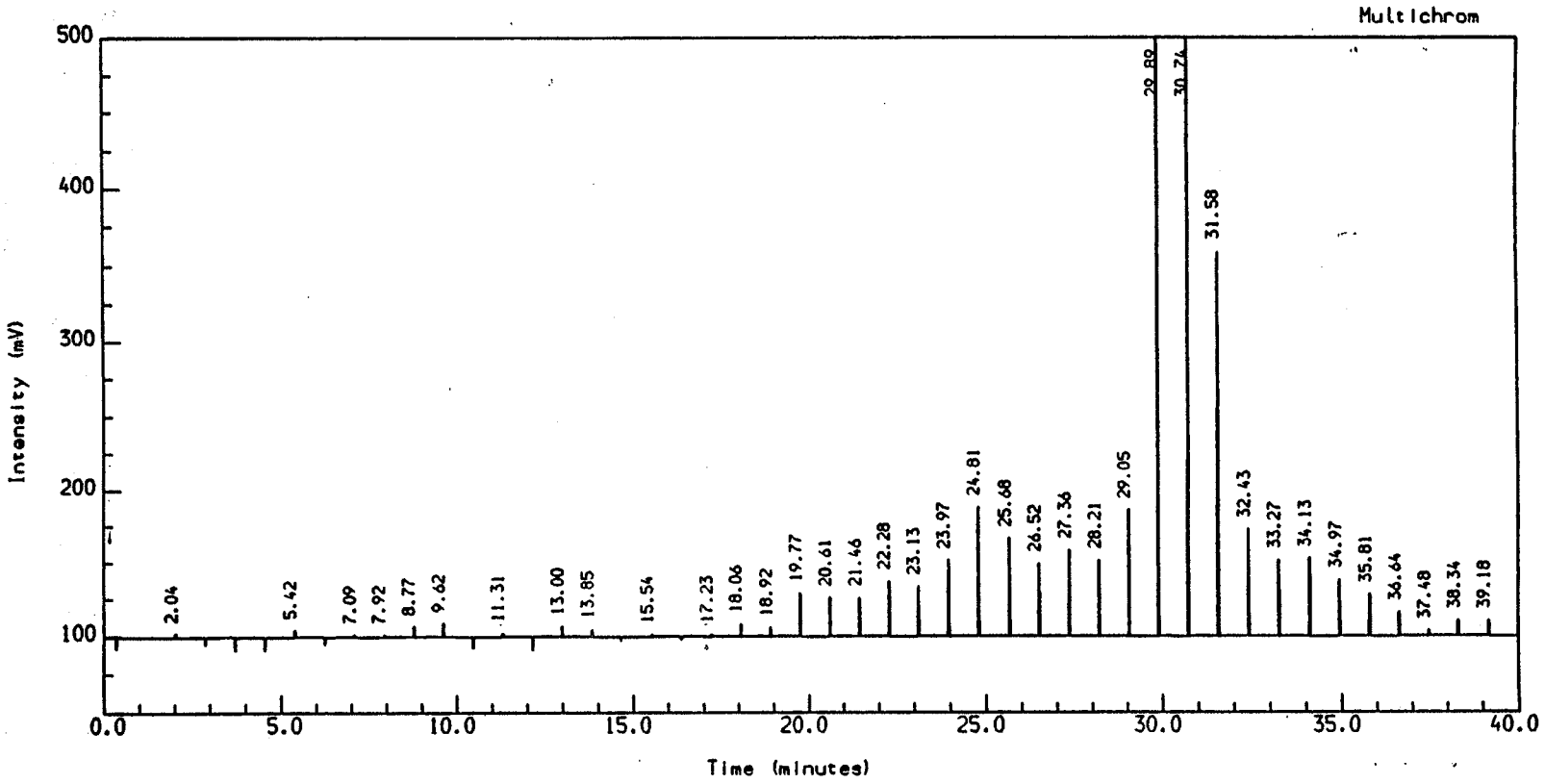
Run Sequence : 251M01-4

Analysis Group 1. As+5 Stand 3, 750 ug/L As

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-4,1,1.

Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 25-MAY-1994 at 16:17

Reported on 26-JUL-1994 at 16:15

Method : 251M01-4

Calibration :

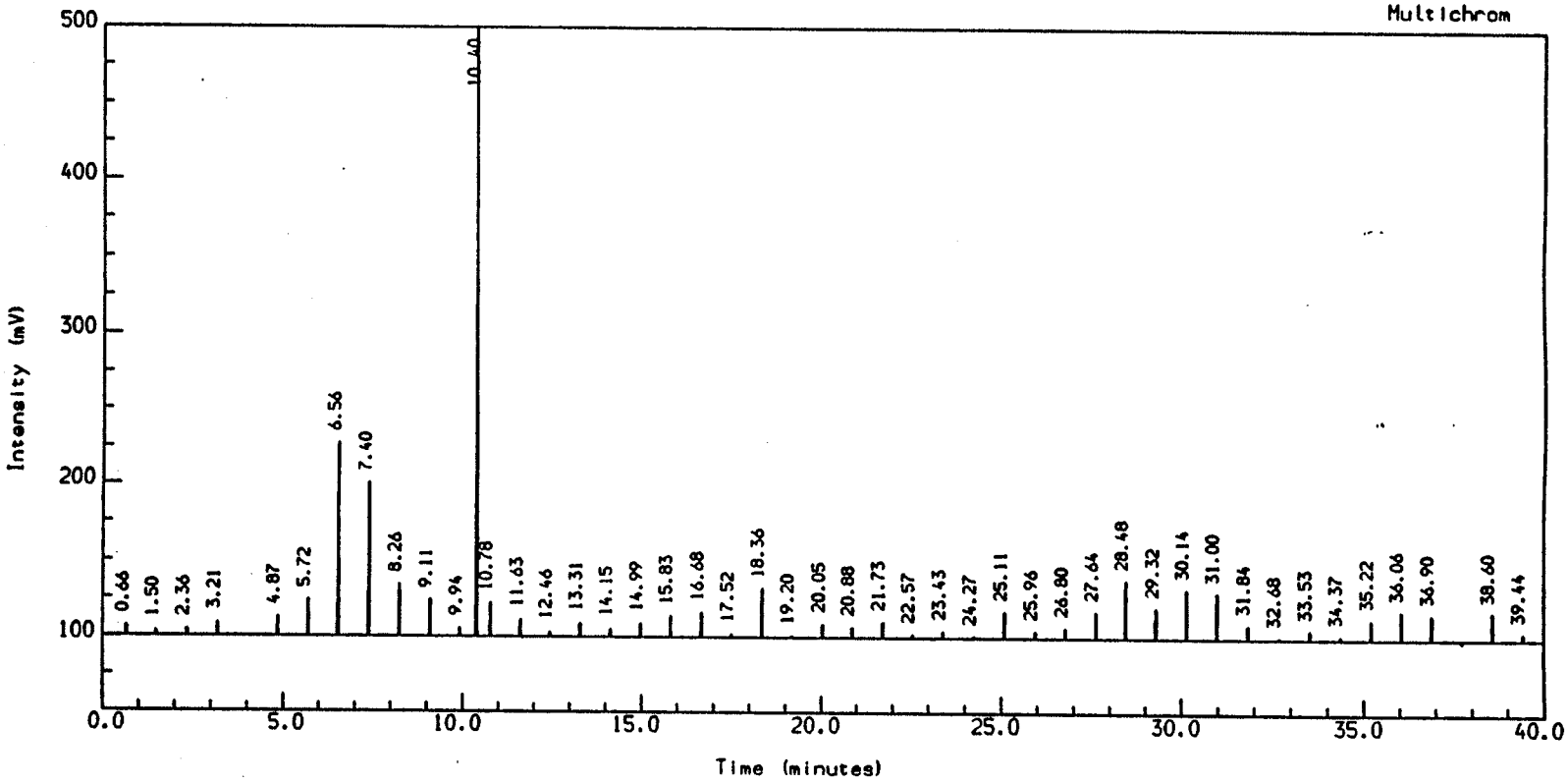
Run Sequence : 251M01-4

Ana 'sis Group 1. As+5 Standard 750 ug/L

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,3,1.

Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-MAY-1994 at 21:28

Reported on 26-JUL-1994 at 15:58

Method : 251M01-3

Calibration :

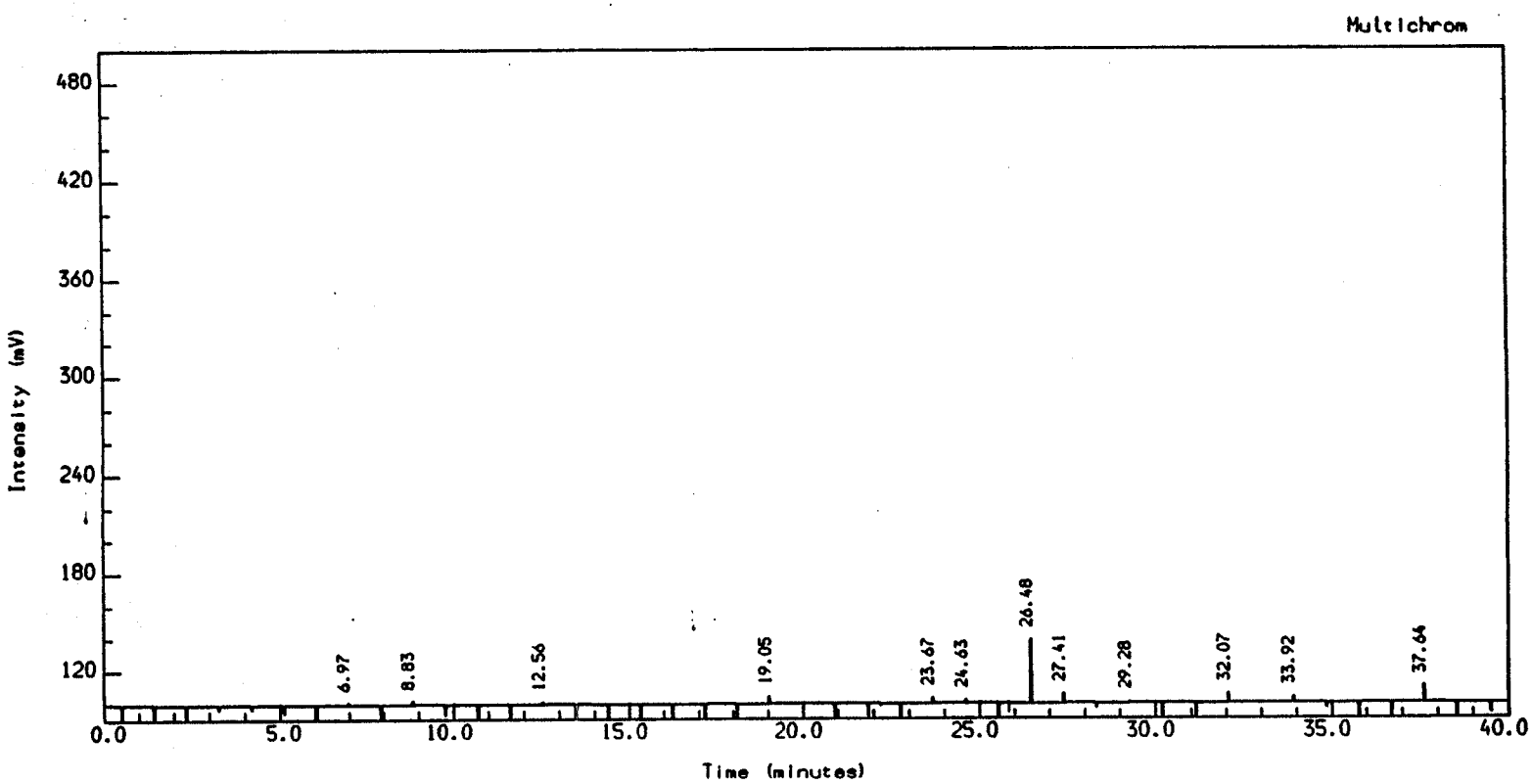
Run Sequence : 251M01-3

nalysis Group 1. As+3 Sti lard, 1,000 ug/L As

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,8,1.

940608-0586 Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 21-JUN-1994 at 23:20

Reported on 26-JUL-1994 at 10:46

Method : 251M01-7

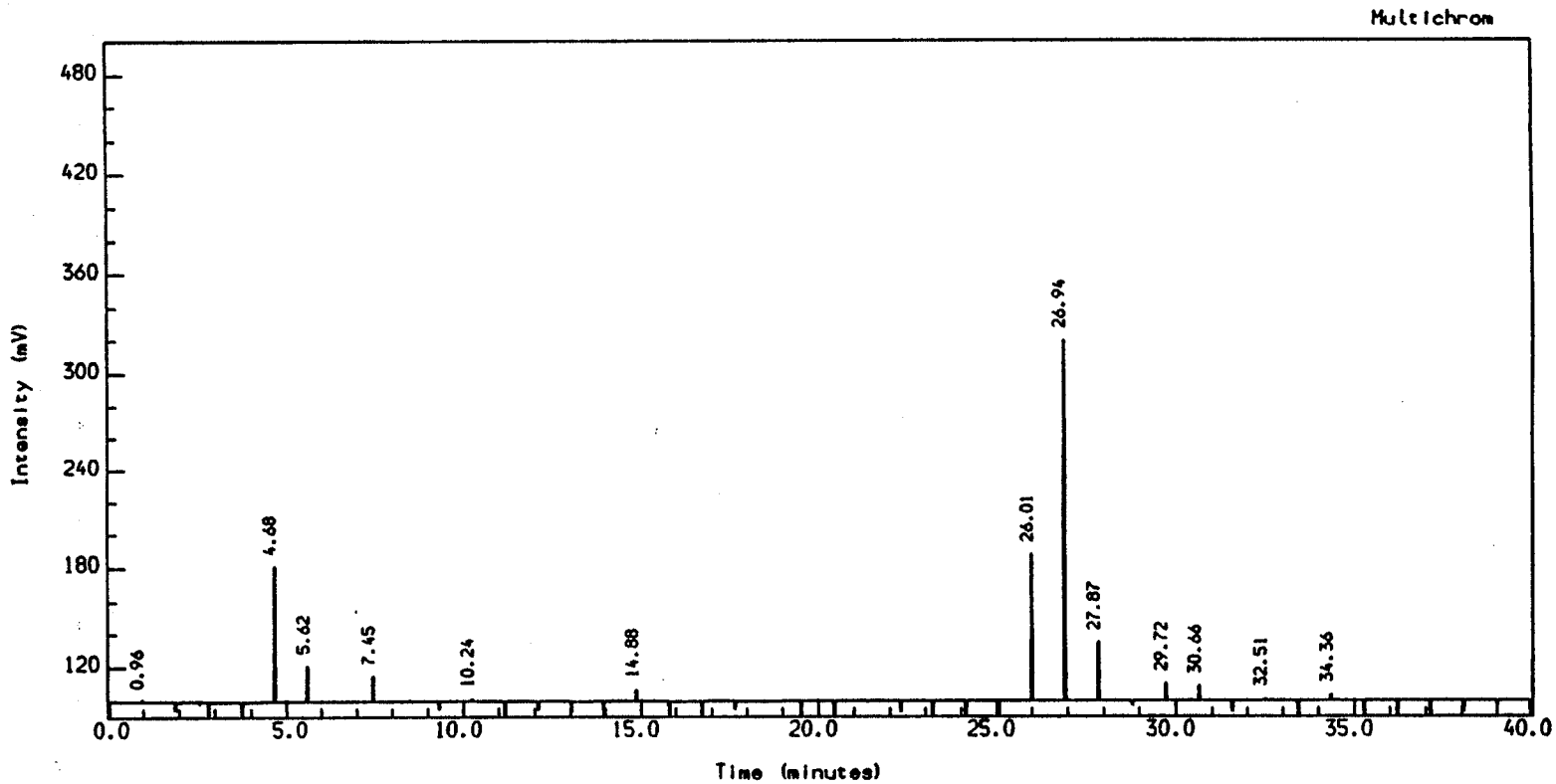
Calibration :

Run Sequence : 251M01-7

Sar e 7-B-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,10,1.
940608-0585 Amount : 1.000



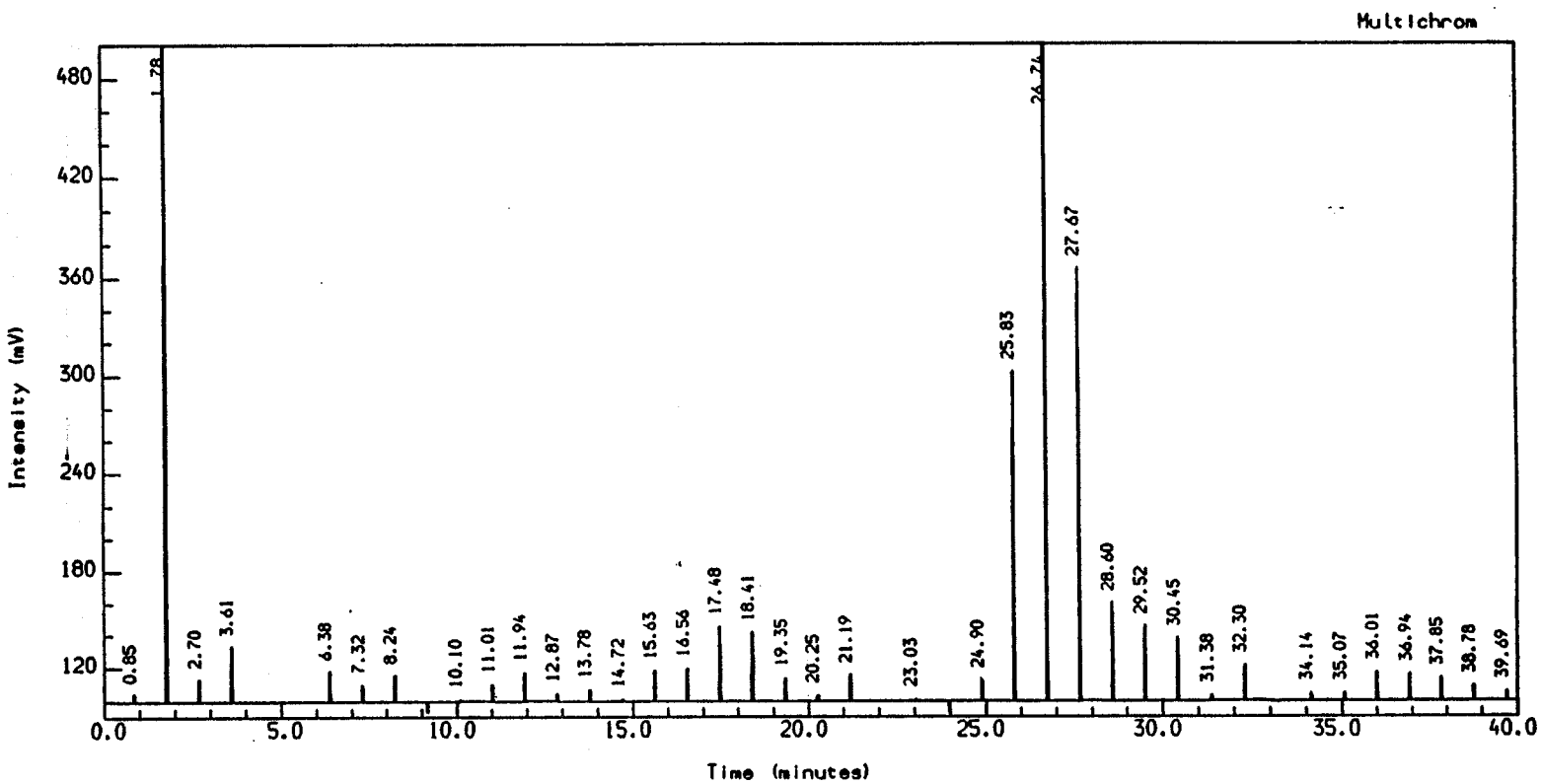
Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 22-JUN-1994 at 00:51
Reported on 26-JUL-1994 at 10:46

Method : 251M01-7
Calibration :
Run Sequence : 251M01-7

Sample 7-B-2

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,17,1.
940608-0584 Amount : 1.000



Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 17-JUN-1994 at 03:34
Reported on 26-JUL-1994 at 09:14

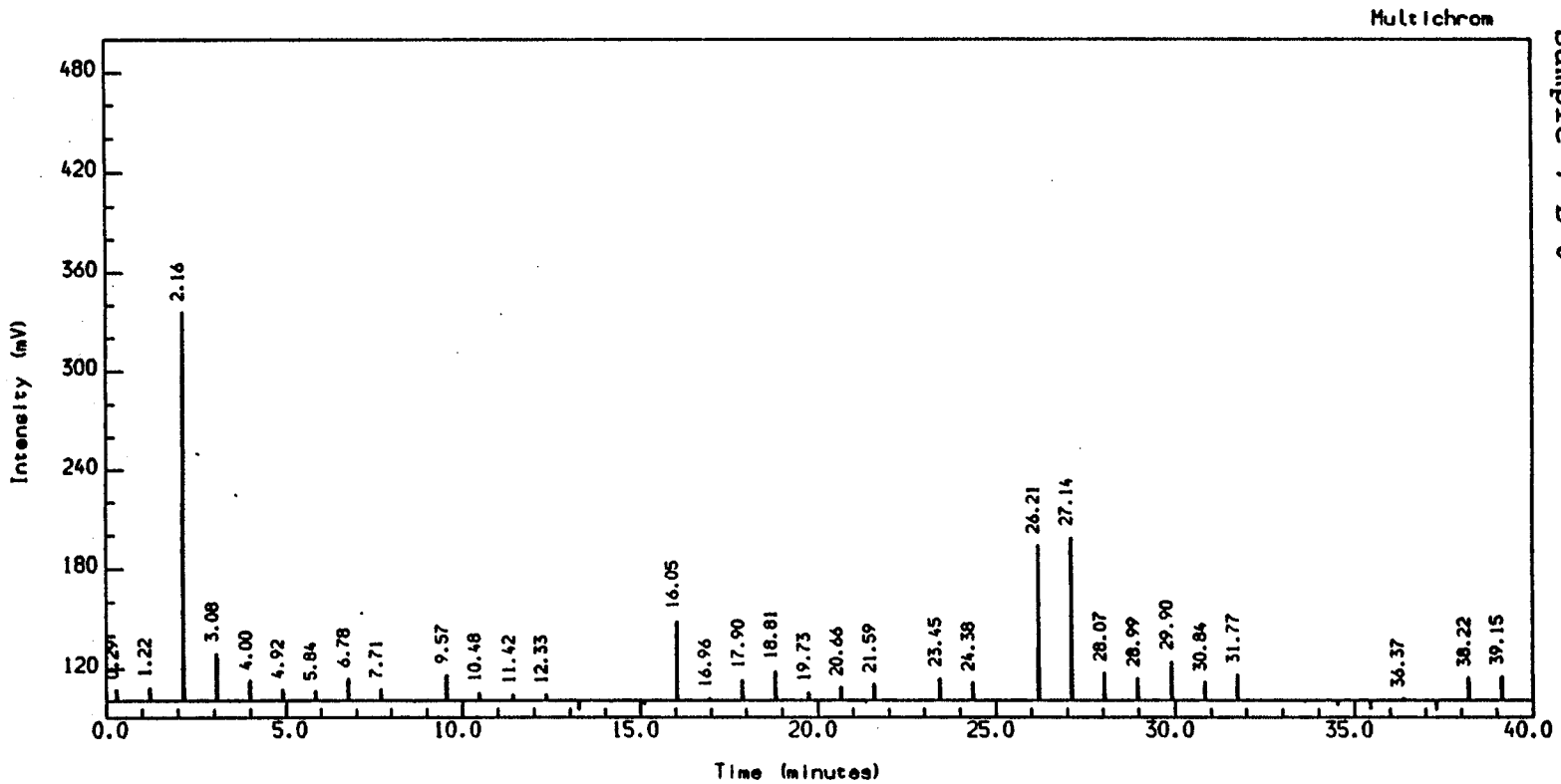
Method : 251M01-6
Calibration :
Run Sequence : 251M01-6

Sample 7-B-1

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,16,1.

940608-0583 Amount : 1.000



Sample 7-B-0

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-JUN-1994 at 02:48

Reported on 26-JUL-1994 at 09:14

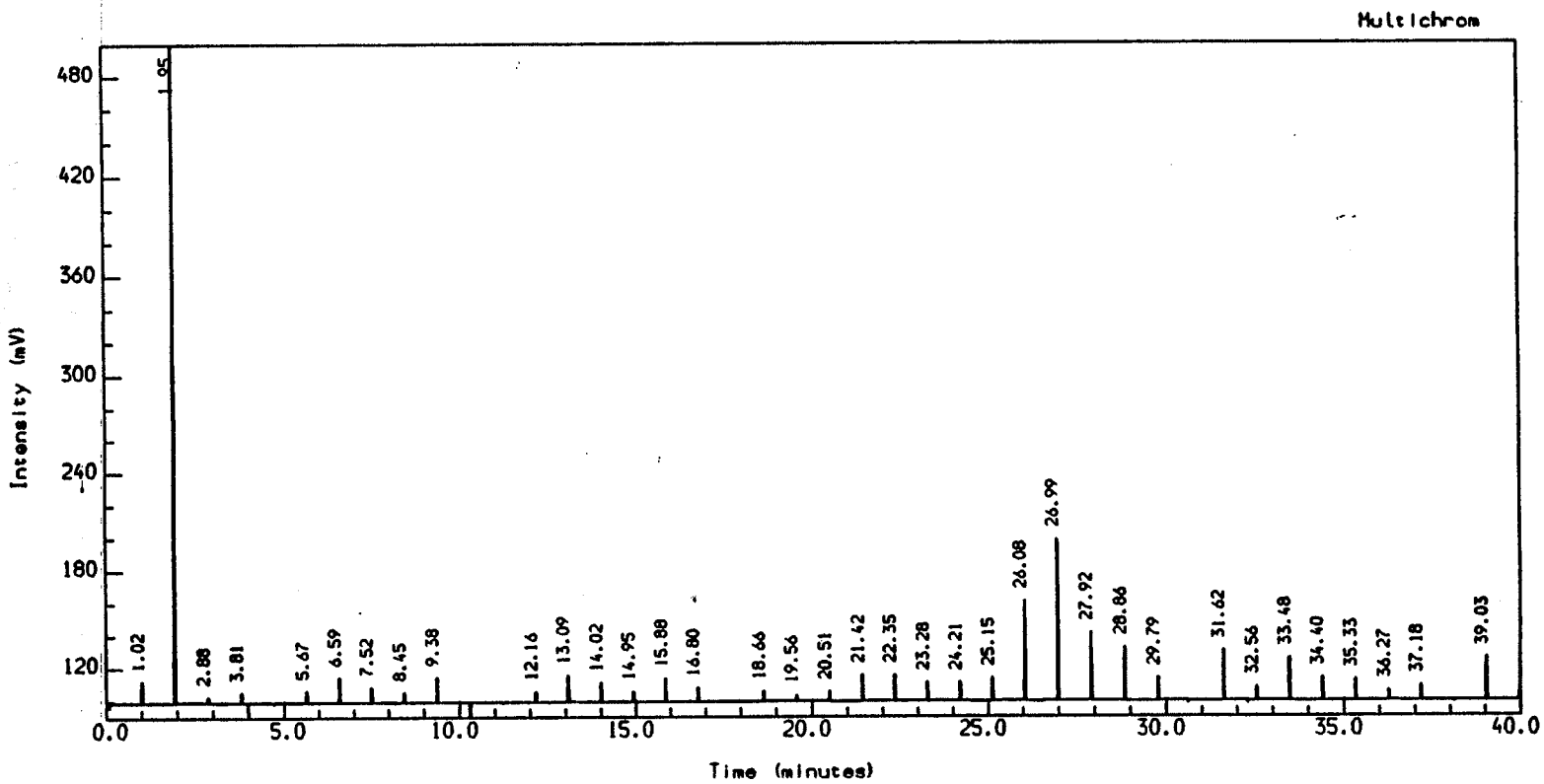
Method : 251M01-6

Calibration :

Run Sequence : 251M01-6

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,11,1.
940602-0234 Amount : 1.000



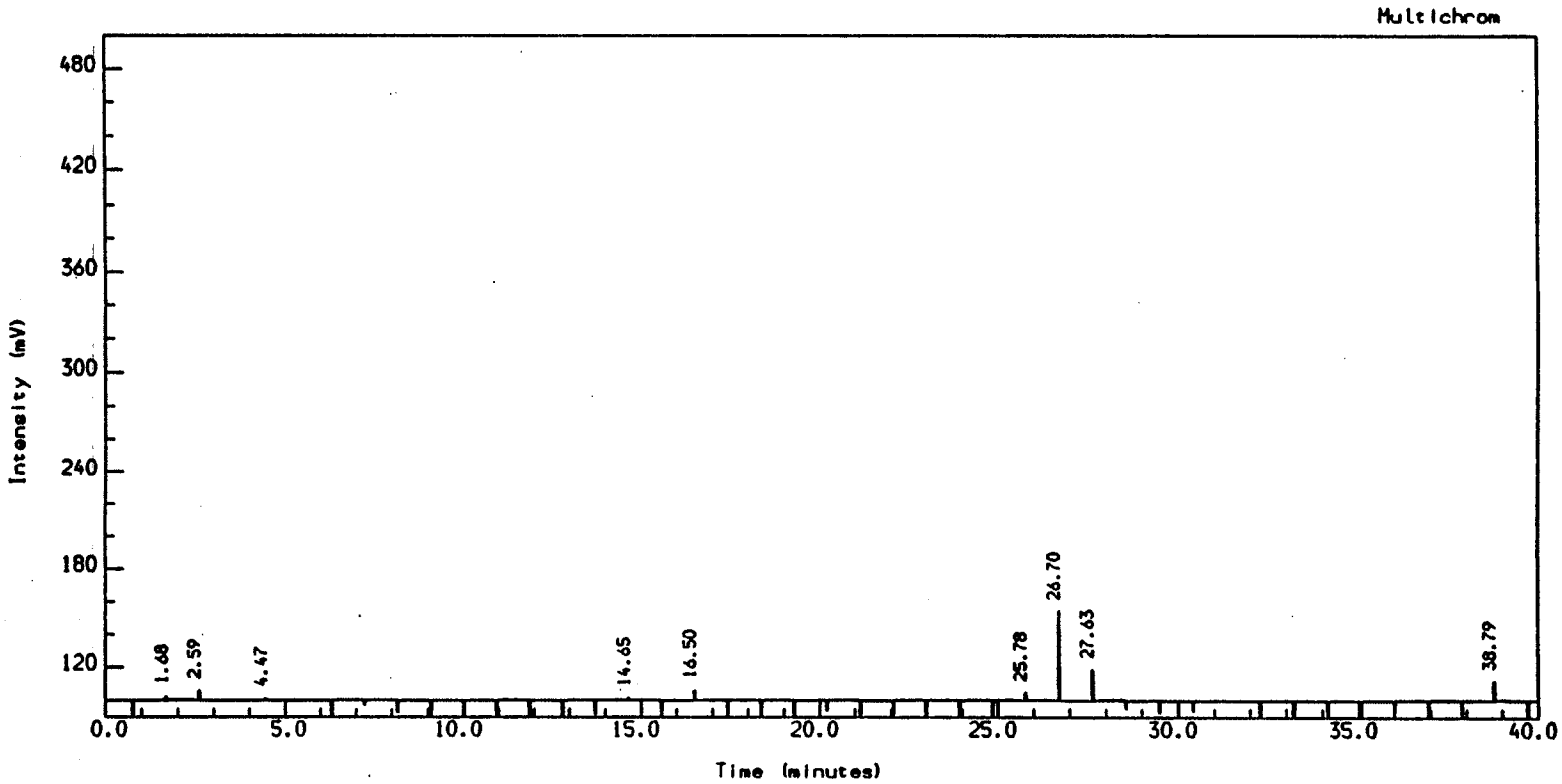
Sa le 6-B-0

Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 16-JUN-1994 at 22:59
Reported on 26-JUL-1994 at 09:13

Method : 251M01-6
Calibration :
Run Sequence : 251M01-6

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,7,1.
940527-0485 Amount : 1.000



Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 21-JUN-1994 at 22:34
Reported on 26-JUL-1994 at 10:45

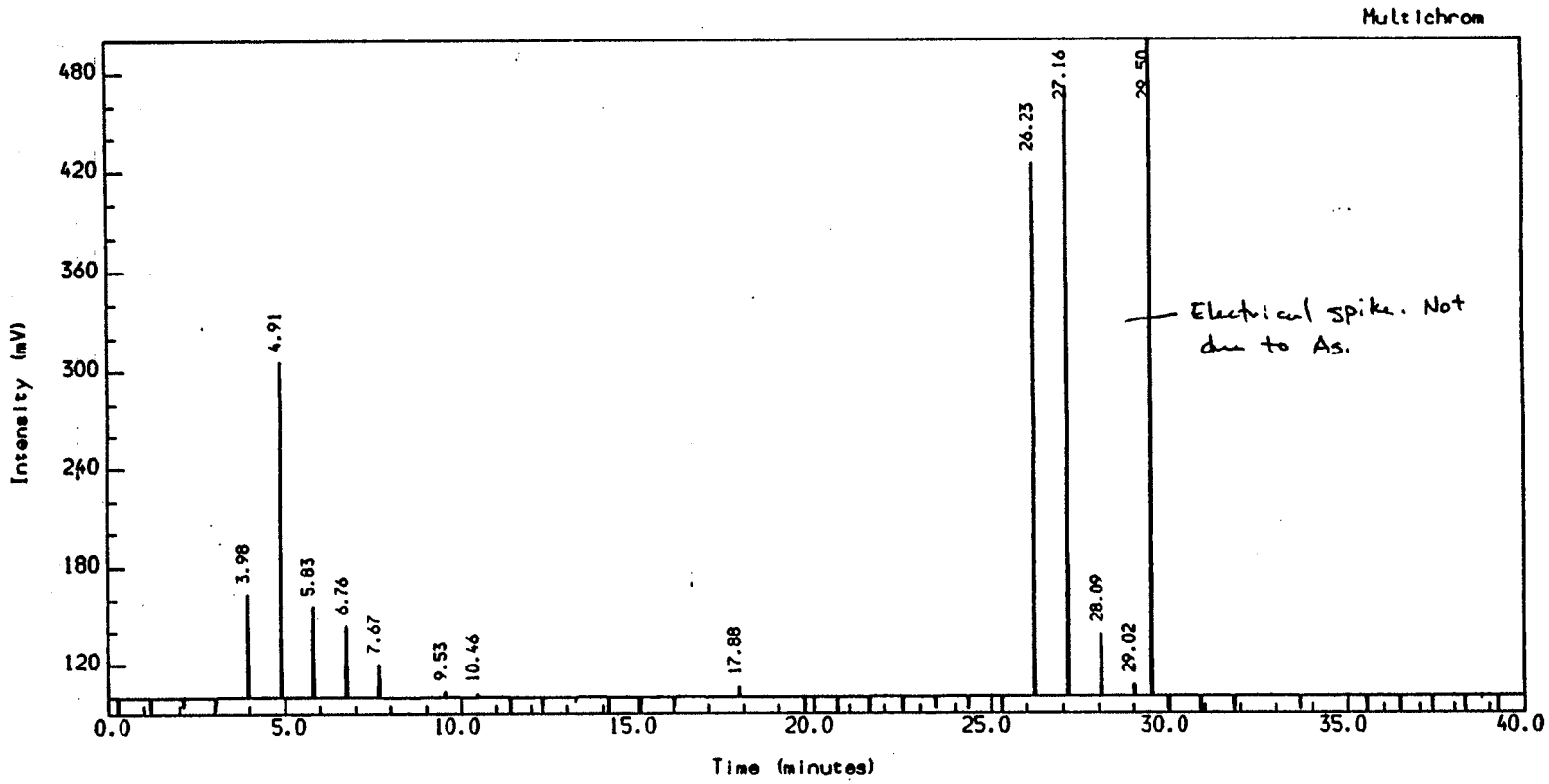
Method : 251M01-7
Calibration :
Run Sequence : 251M01-7

ple 5-B-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,9,1.

940527-0484 Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 22-JUN-1994 at 00:06

Reported on 26-JUL-1994 at 10:46

Method : 251M01-7

Calibration :

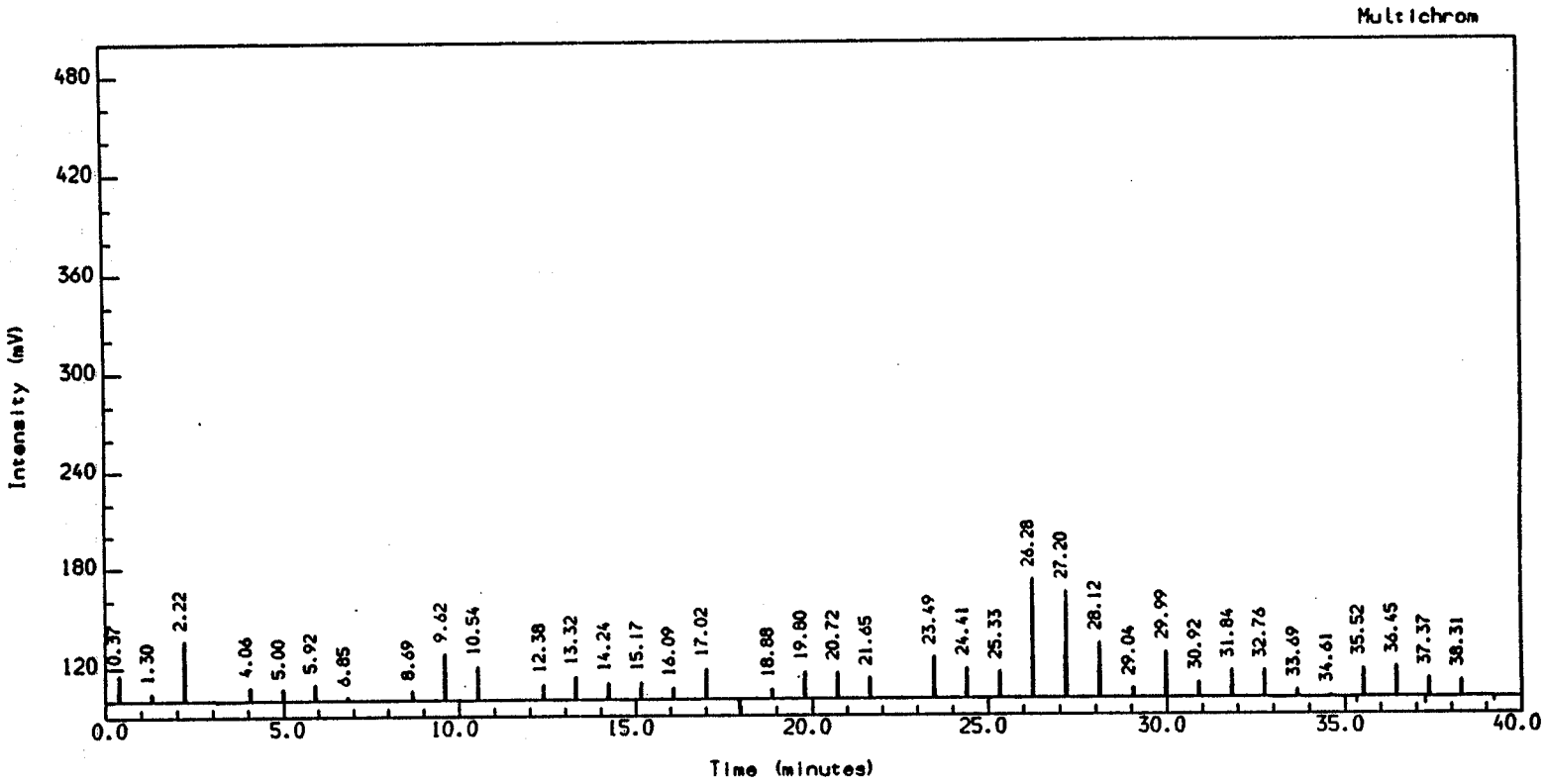
Run Sequence : 251M01-7

Sample 5-B-2

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6.13.1.

940527-0483 Amount : 1.000



Sample 5-B-1

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-JUN-1994 at 00:31

Reported on 26-JUL-1994 at 09:13

Method : 251M01-6

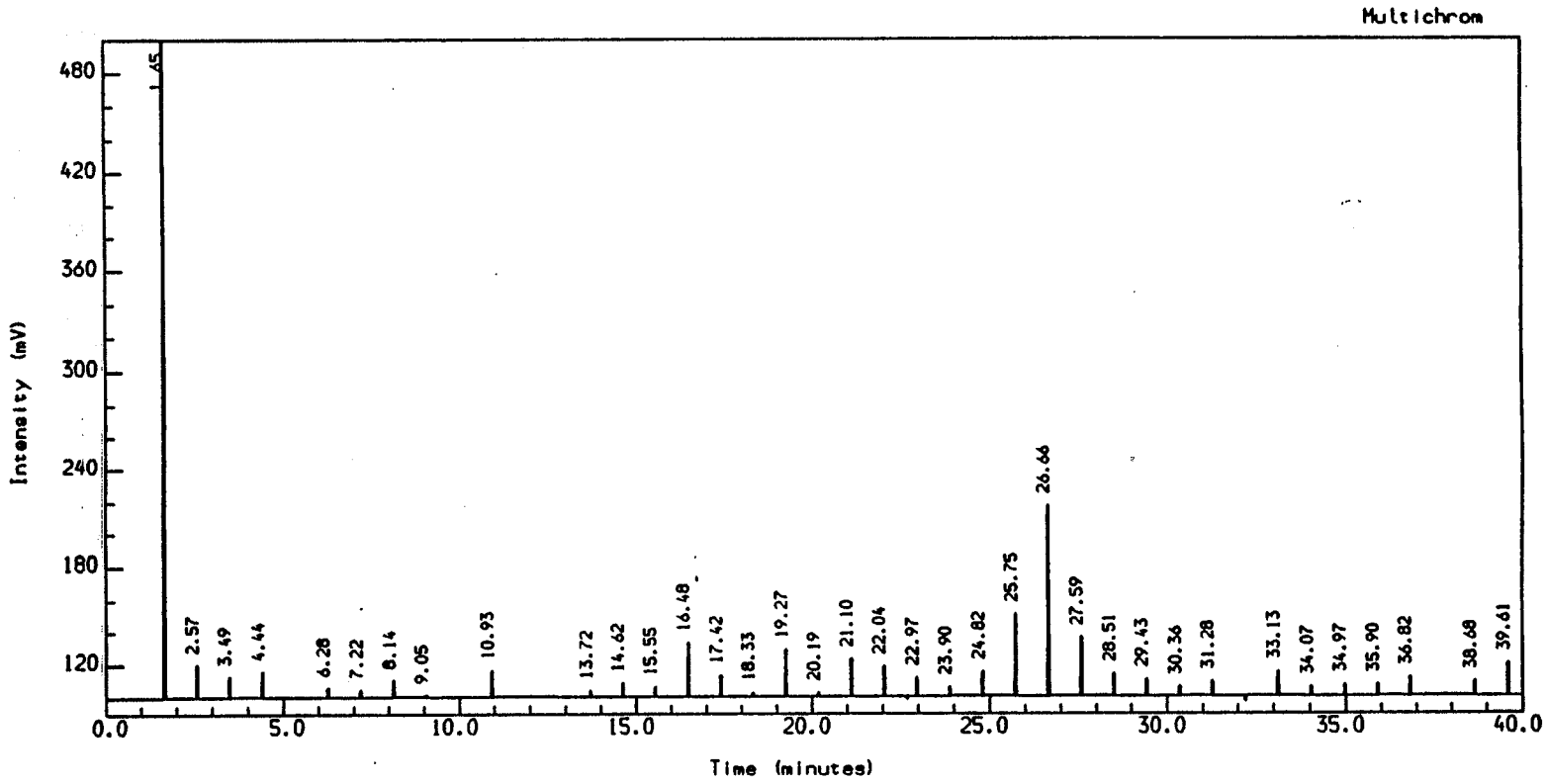
Calibration :

Run Sequence : 251M01-6

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,12,1.

940527-0482 Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-JUN-1994 at 23:45

Reported on 26-JUL-1994 at 09:13

Method : 251M01-6

Calibration :

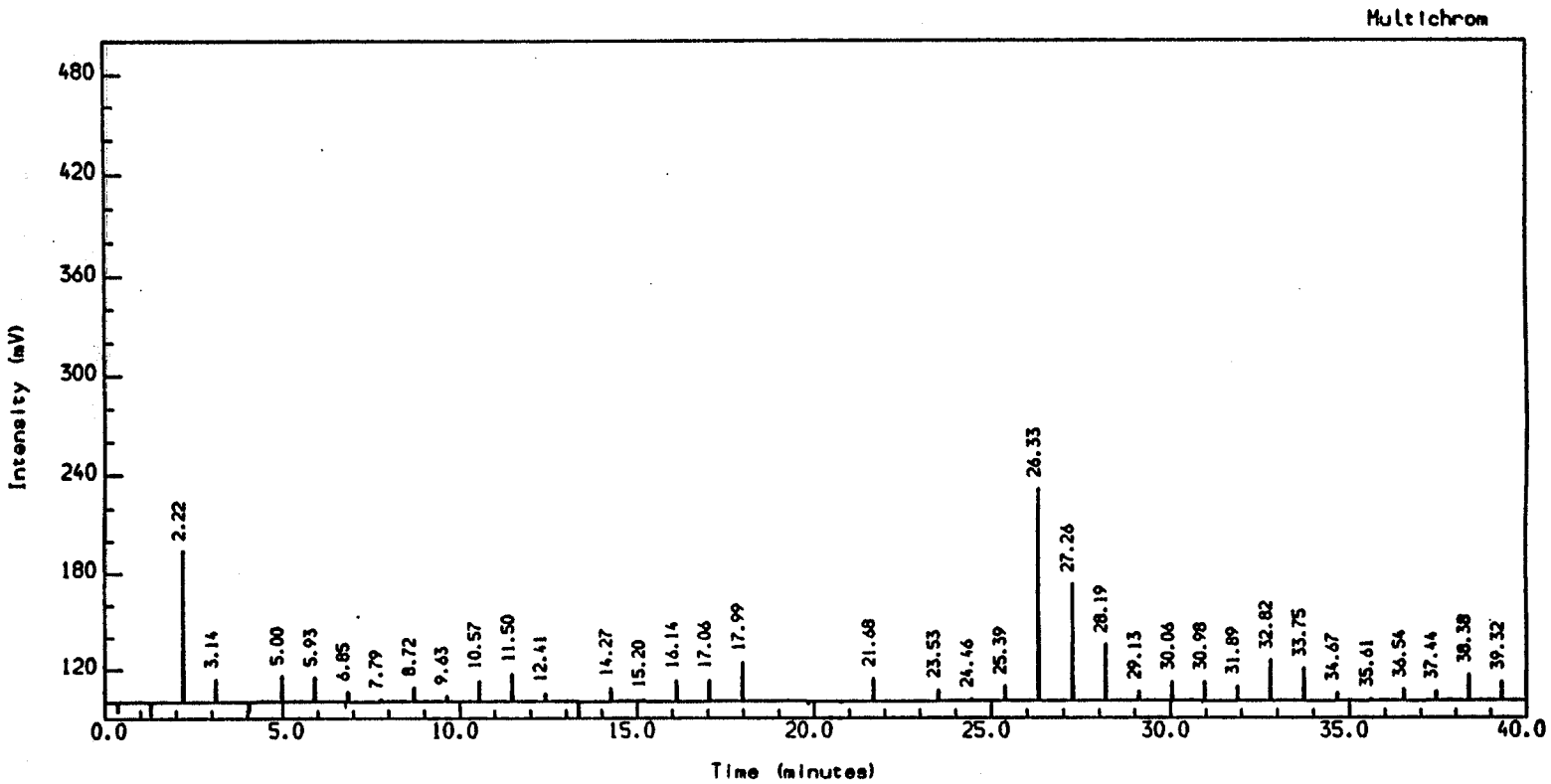
Run Sequence : 251M01-6

ple 5-B-0

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,10,1.

940518-0157 Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-JUN-1994 at 22:14

Reported on 26-JUL-1994 at 09:13

Method : 251M01-6

Calibration :

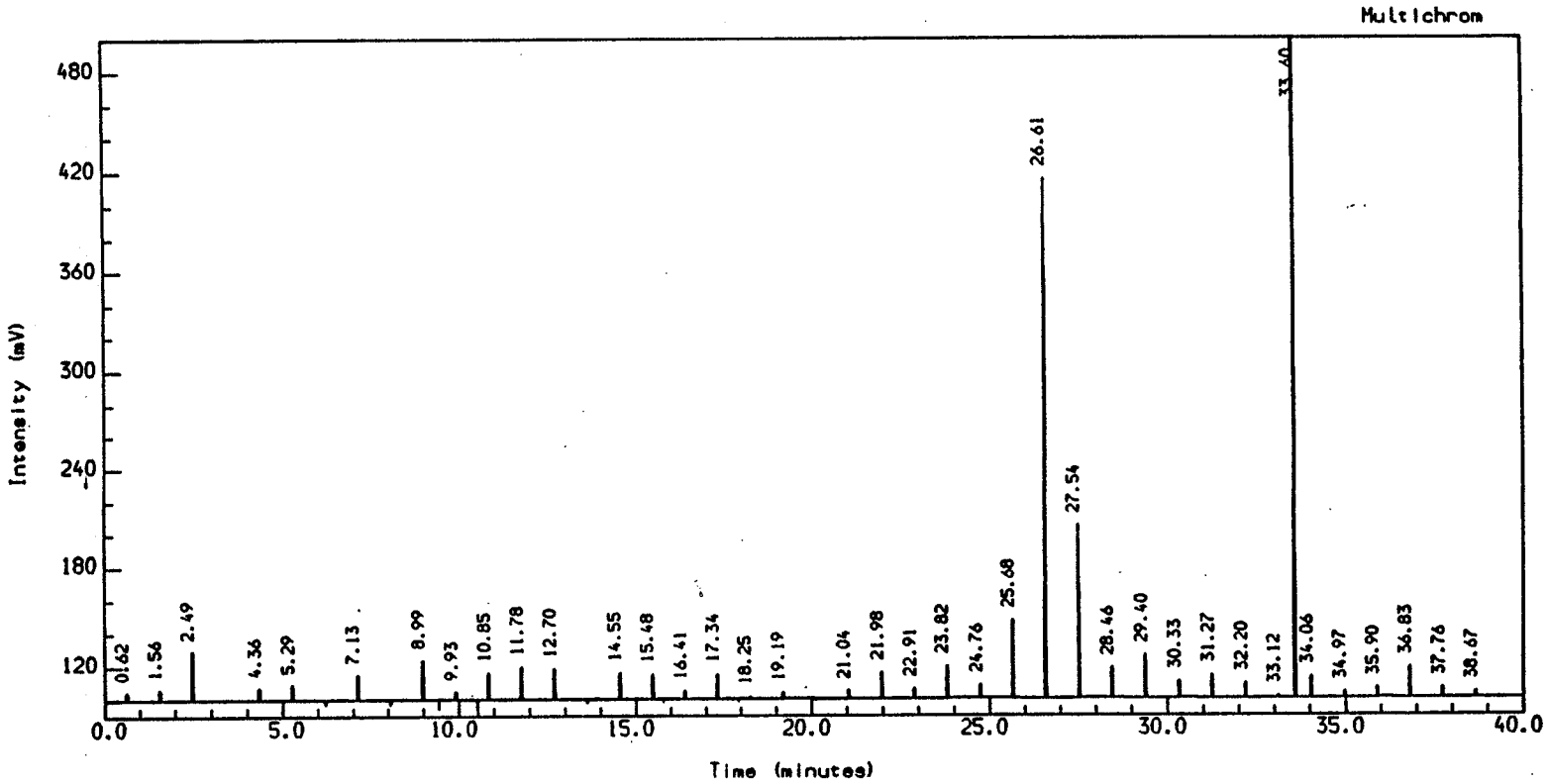
Run Sequence : 251M01-6

ample 4-B-0

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6.9.1.
940511-0129 Amount : 1.000

Sample 3-B-0



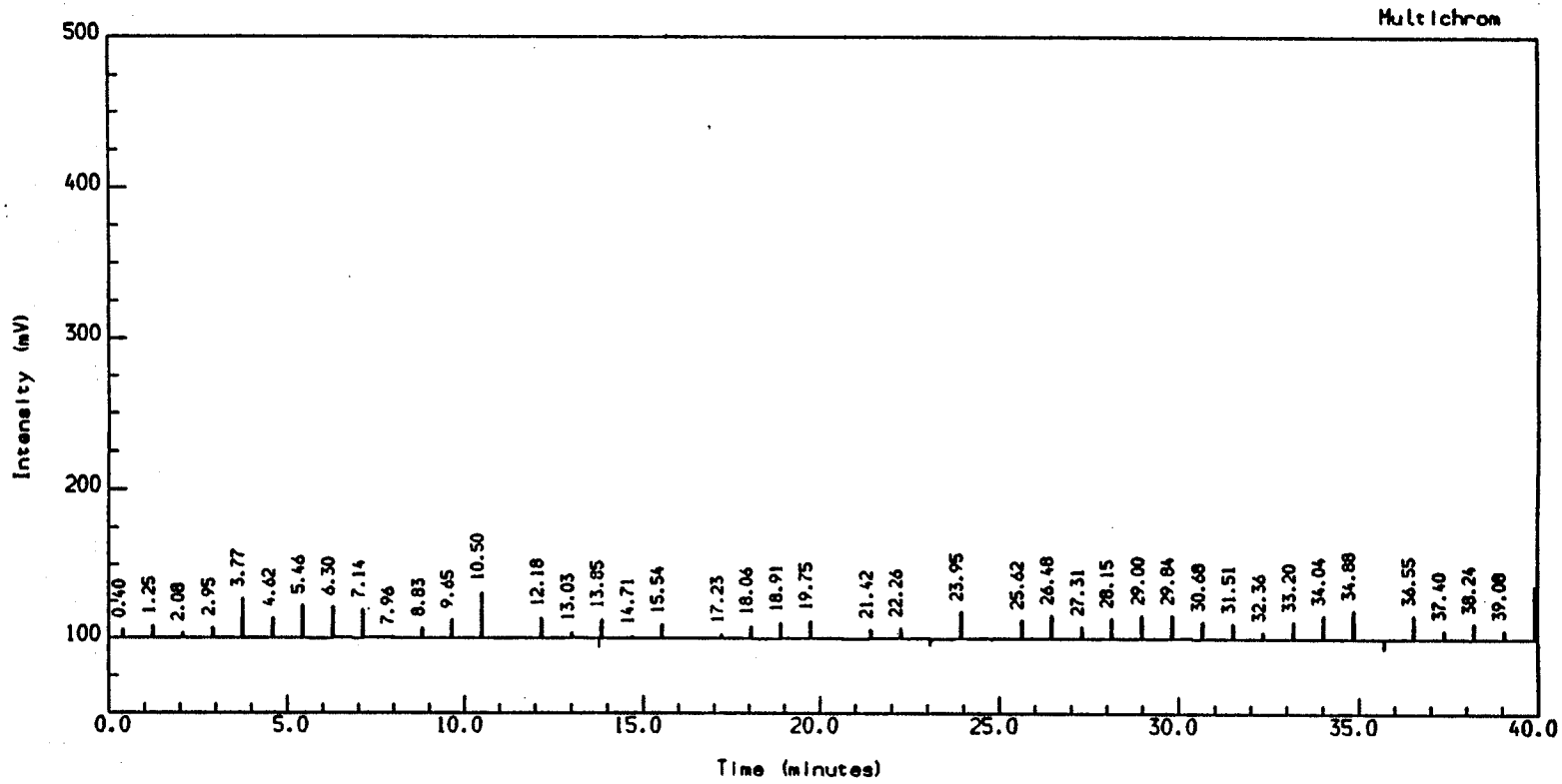
Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 16-JUN-1994 at 21:28
Reported on 26-JUL-1994 at 09:13

Method : 251M01-6
Calibration :
Run Sequence : 251M01-6

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,21,1.

940505-0105 Amount : 1.000



Sample 2-B-3

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-MAY-1994 at 10:35

Reported on 26-JUL-1994 at 09:08

Method : 251M01-3

Calibration :

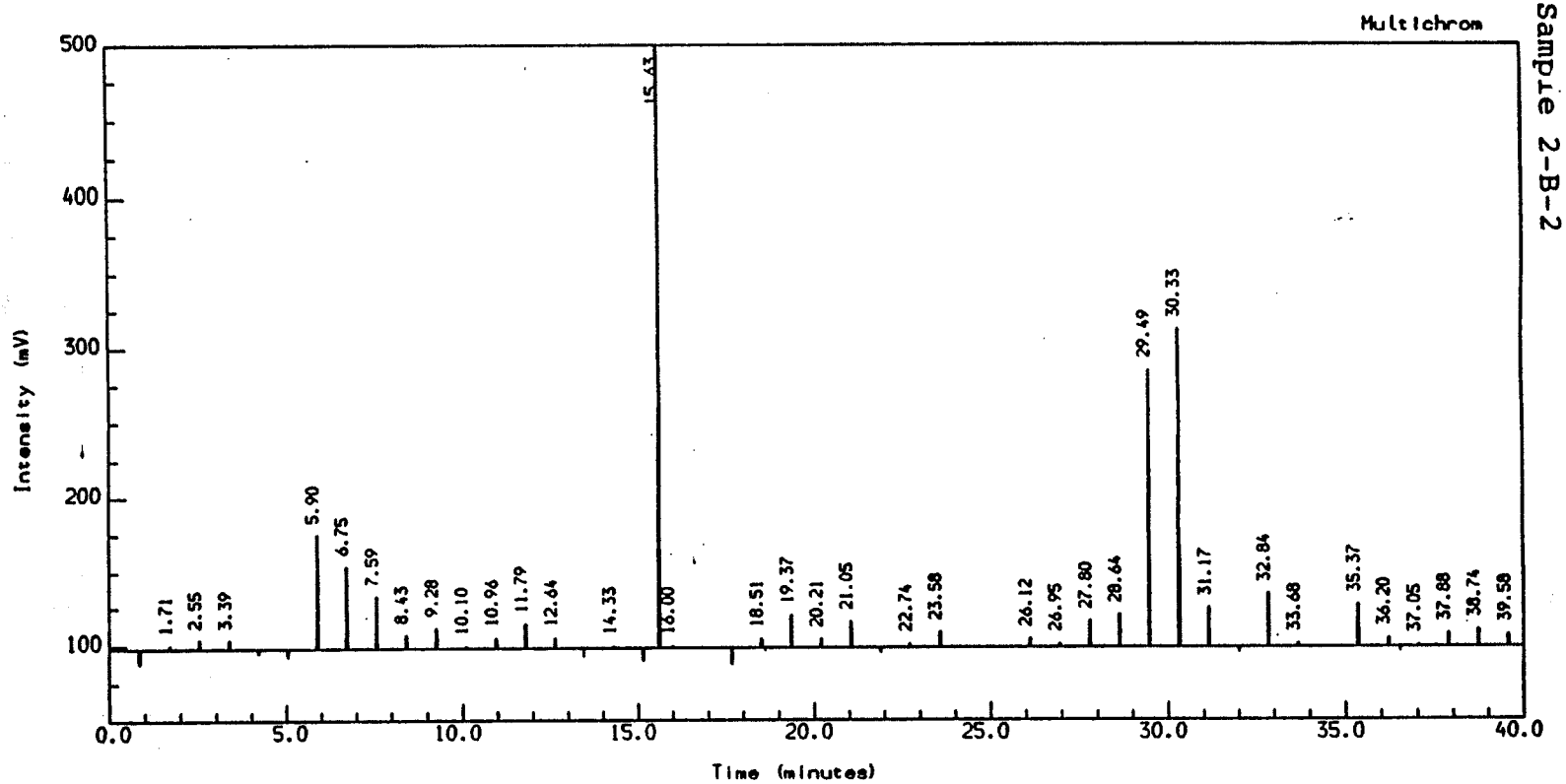
Run Sequence : 251M01-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,15,1.

940505-0104 Amount : 1.000

Sample 2-B-2



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-MAY-1994 at 06:13

Reported on 26-JUL-1994 at 09:07

Method : 251M01-3

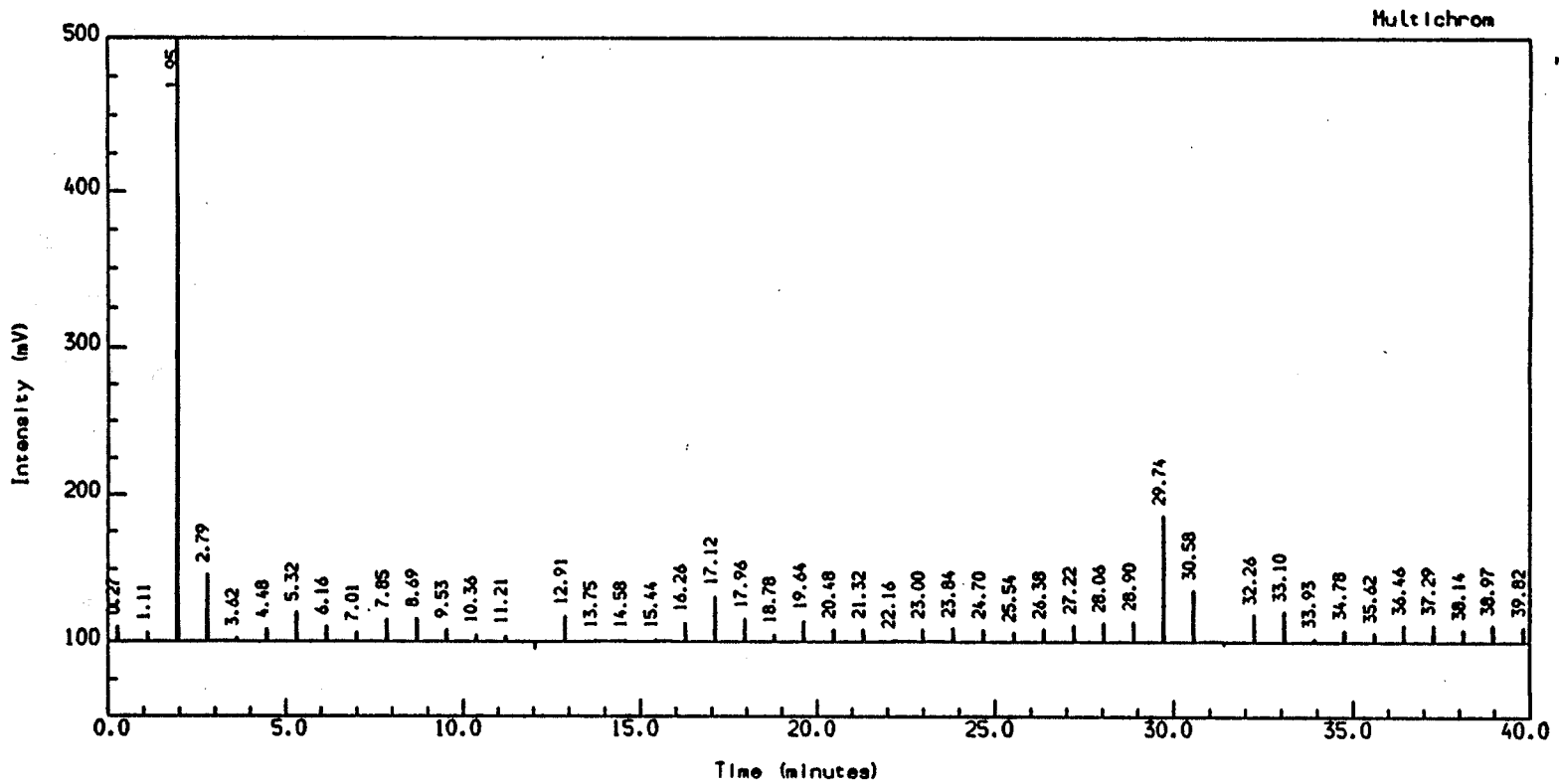
Calibration :

Run Sequence : 251M01-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,19,1.
940505-0103 Amount : 1.000

Sample 2-B-1



Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 17-MAY-1994 at 09:08
Reported on 26-JUL-1994 at 09:08

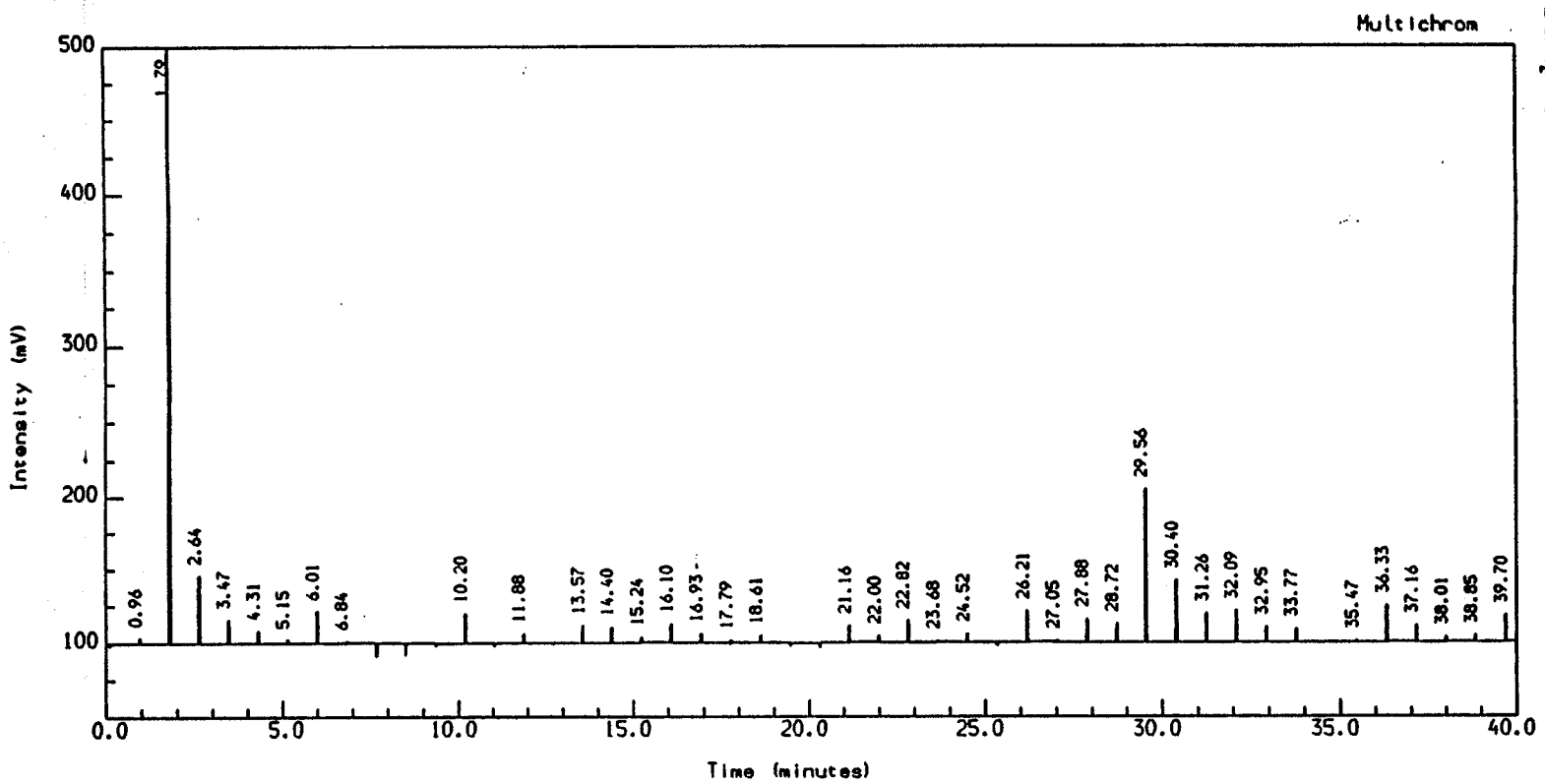
Method : 251M01-3
Calibration :
Run Sequence : 251M01-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,17,1.

940505-0102 Amount : 1.000

Sample 2-B-0



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-MAY-1994 at 07:40

Reported on 26-JUL-1994 at 09:08

Method : 251M01-3

Calibration :

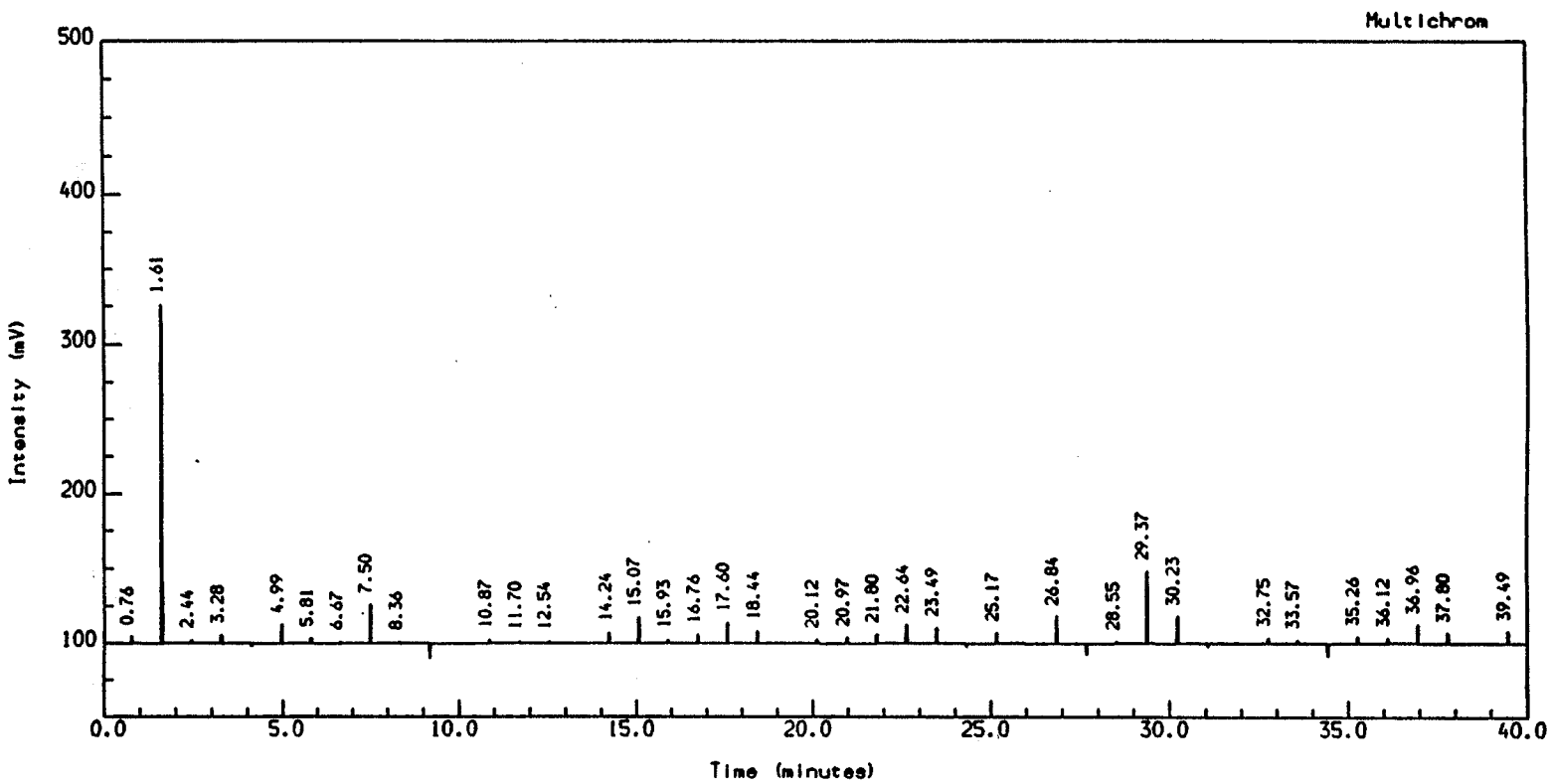
Run Sequence : 251M01-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,13,1.

940429-0494 Amount : 1.000

Sample 1-B-0



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-MAY-1994 at 04:46

Reported on 26-JUL-1994 at 09:07

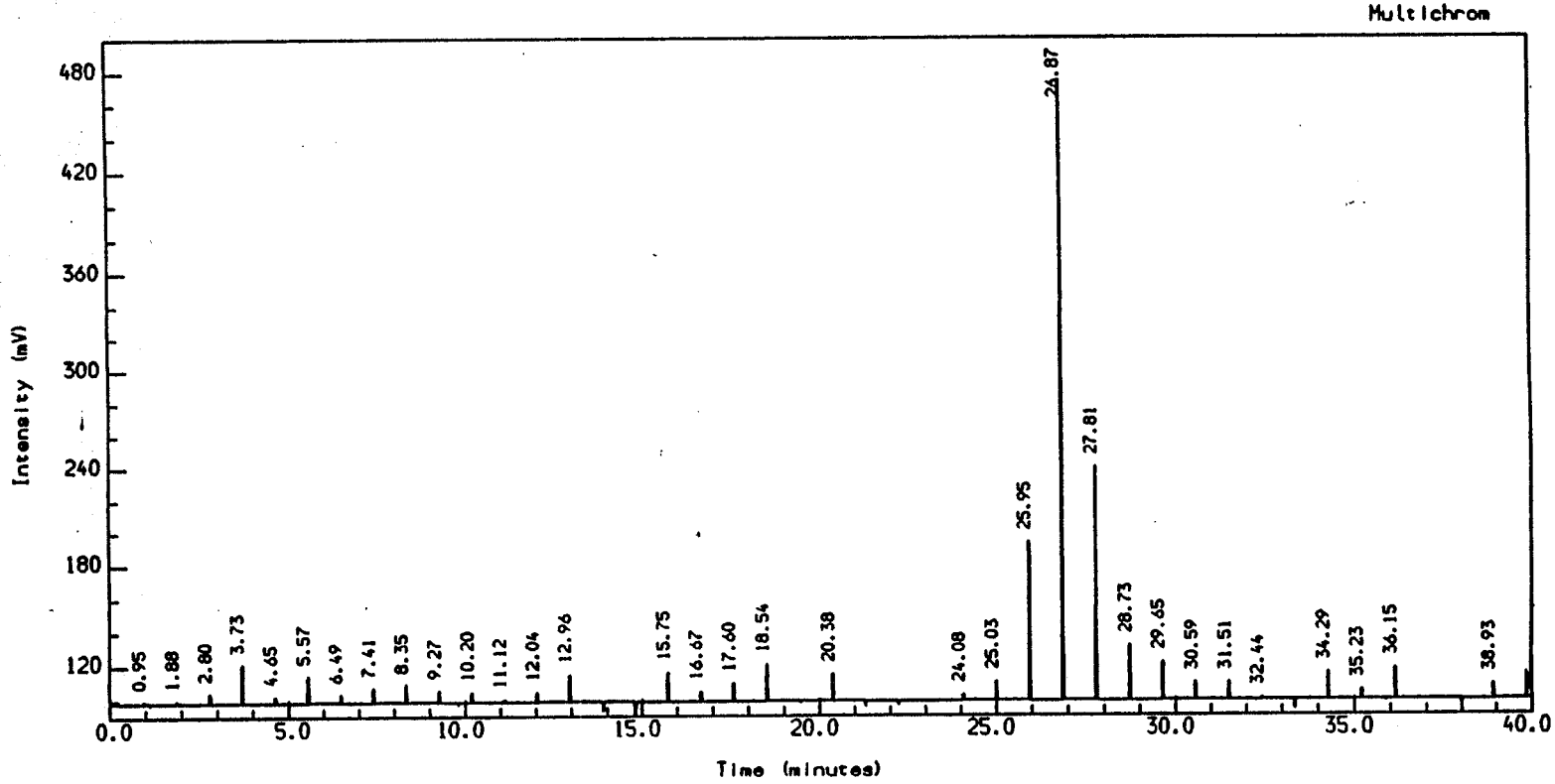
Method : 251M01-3

Calibration :

Run Sequence : 251M01-3

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6.8.1.
940602-0234SPKAS5 Amount : 1.000



Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 16-JUN-1994 at 20:42
Reported on 26-JUL-1994 at 09:13

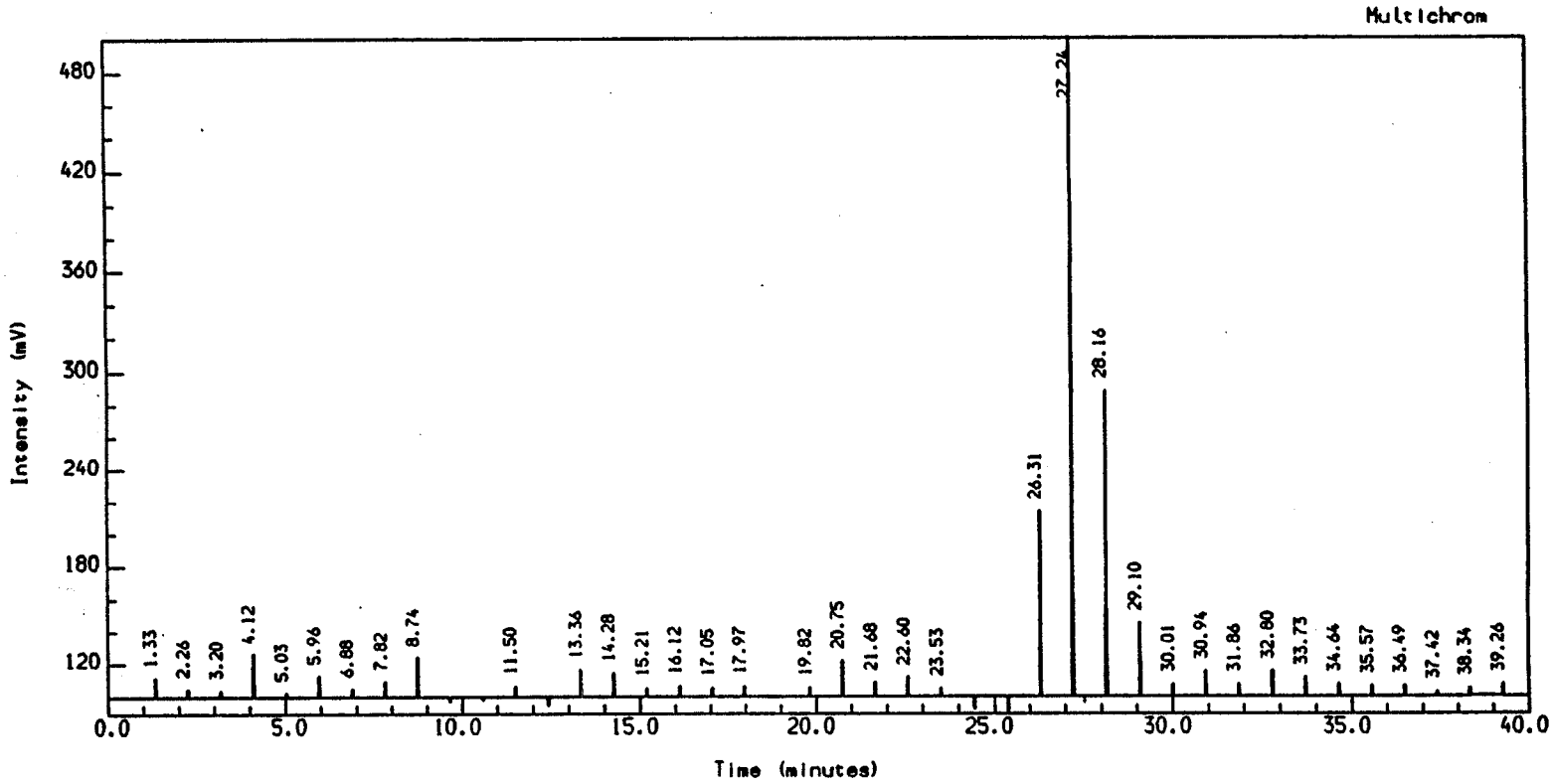
Method : 251M01-6
Calibration :
Run Sequence : 251M01-6

S ple 6-B-0: 50 ug/L As as senate added.

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-6,7,1.

940511-0129SPKAS5 Amount : 1.000



Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 16-JUN-1994 at 19:57

Reported on 26-JUL-1994 at 09:13

Method : 251M01-6

Calibration :

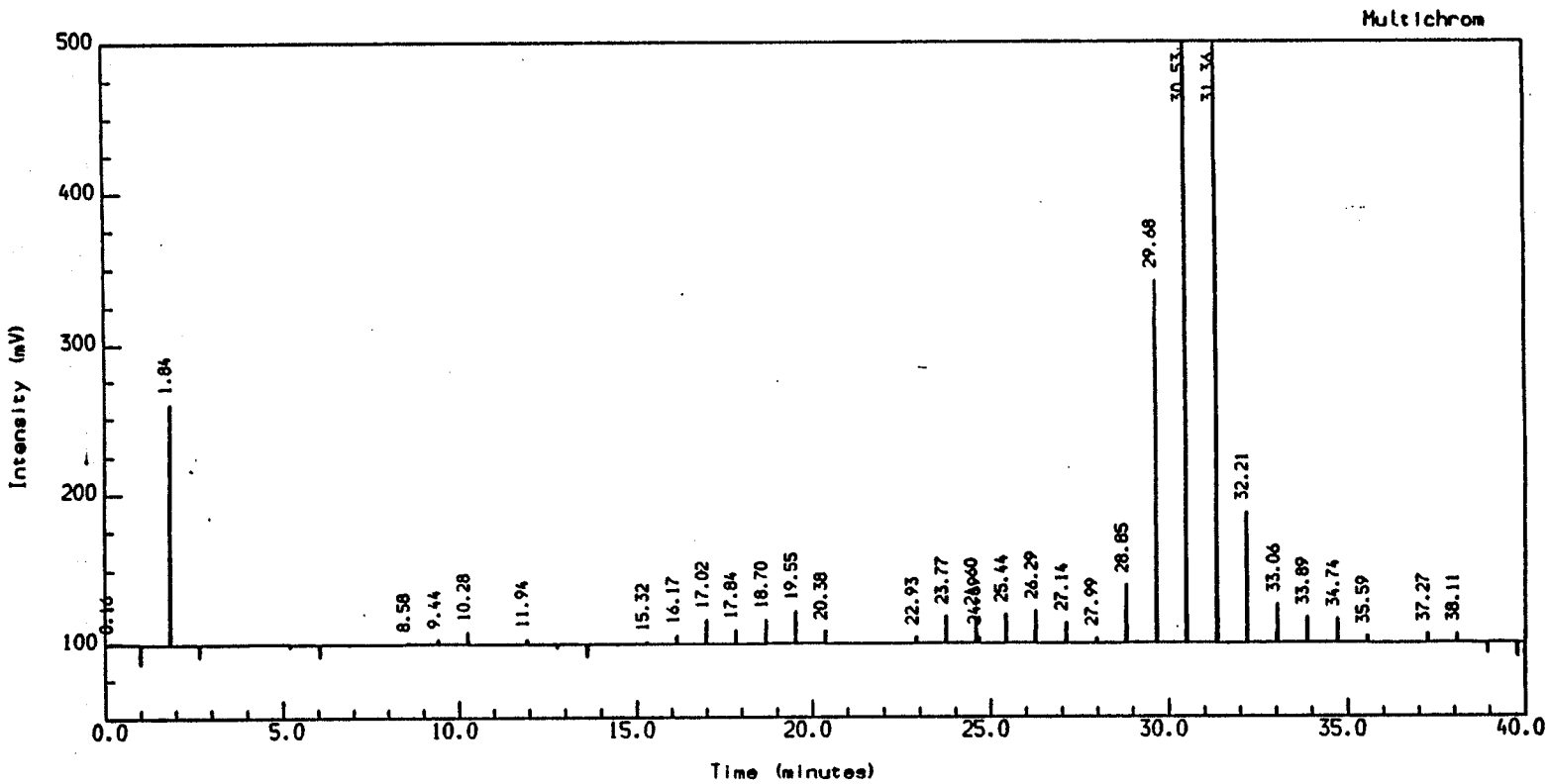
Run Sequence : 251M01-6

ample 3-B-0: 50 ug/L As a arsenate added.

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-4,5,1.

251M01SPKAS5 Amount : 1.000



Sam e 1-B-0: 50 ug/L As as a nate added.

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 25-MAY-1994 at 19:24

Reported on 26-JUL-1994 at 09:09

Method : 251M01-4

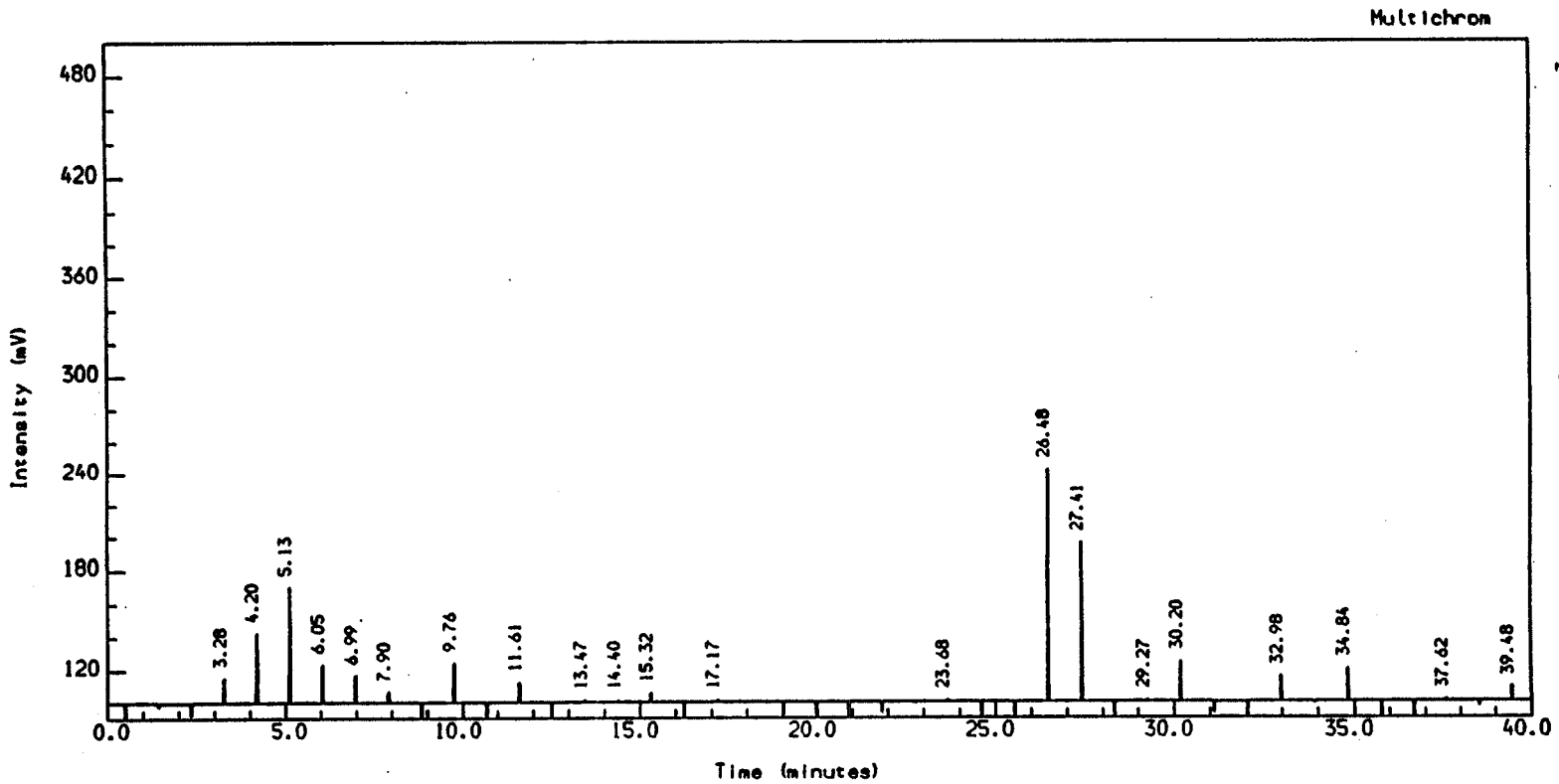
Calibration :

Run Sequence : 251M01-4

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,4,1.

940602-0234SPKAS3 Amount : 1.000



Sample 6-B-0: 50 ug/L As as arsenite added.

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 21-JUN-1994 at 20:17

Reported on 26-JUL-1994 at 10:45

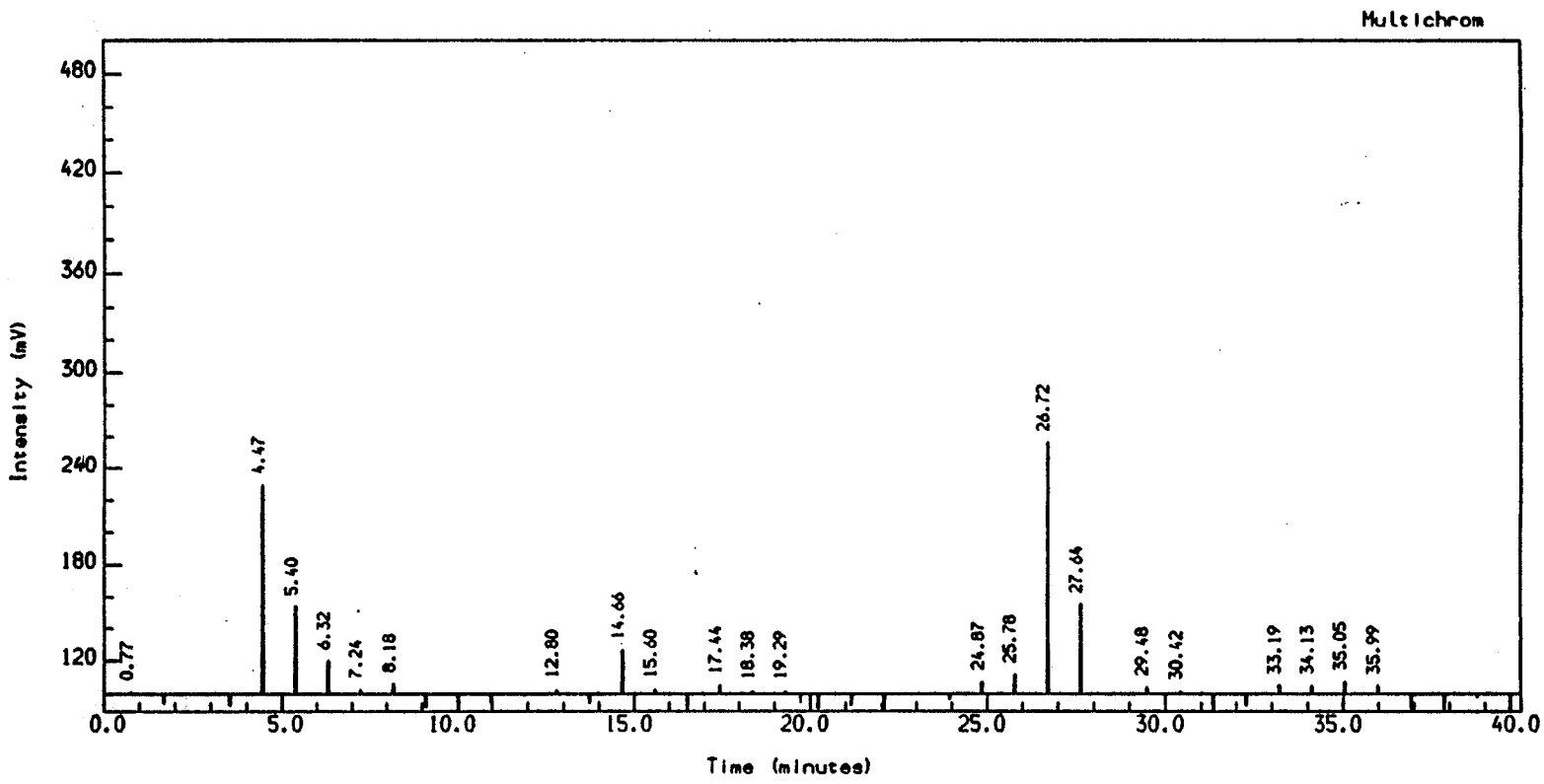
Method : 251M01-7

Calibration :

Run Sequence : 251M01-7

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-7,3,1.
940511-1029SPKAS3 Amount : 1.000



Instrument :
Channel Title : Channel #16
Lims ID :
Acquired on 21-JUN-1994 at 19:31
Reported on 26-JUL-1994 at 10:45

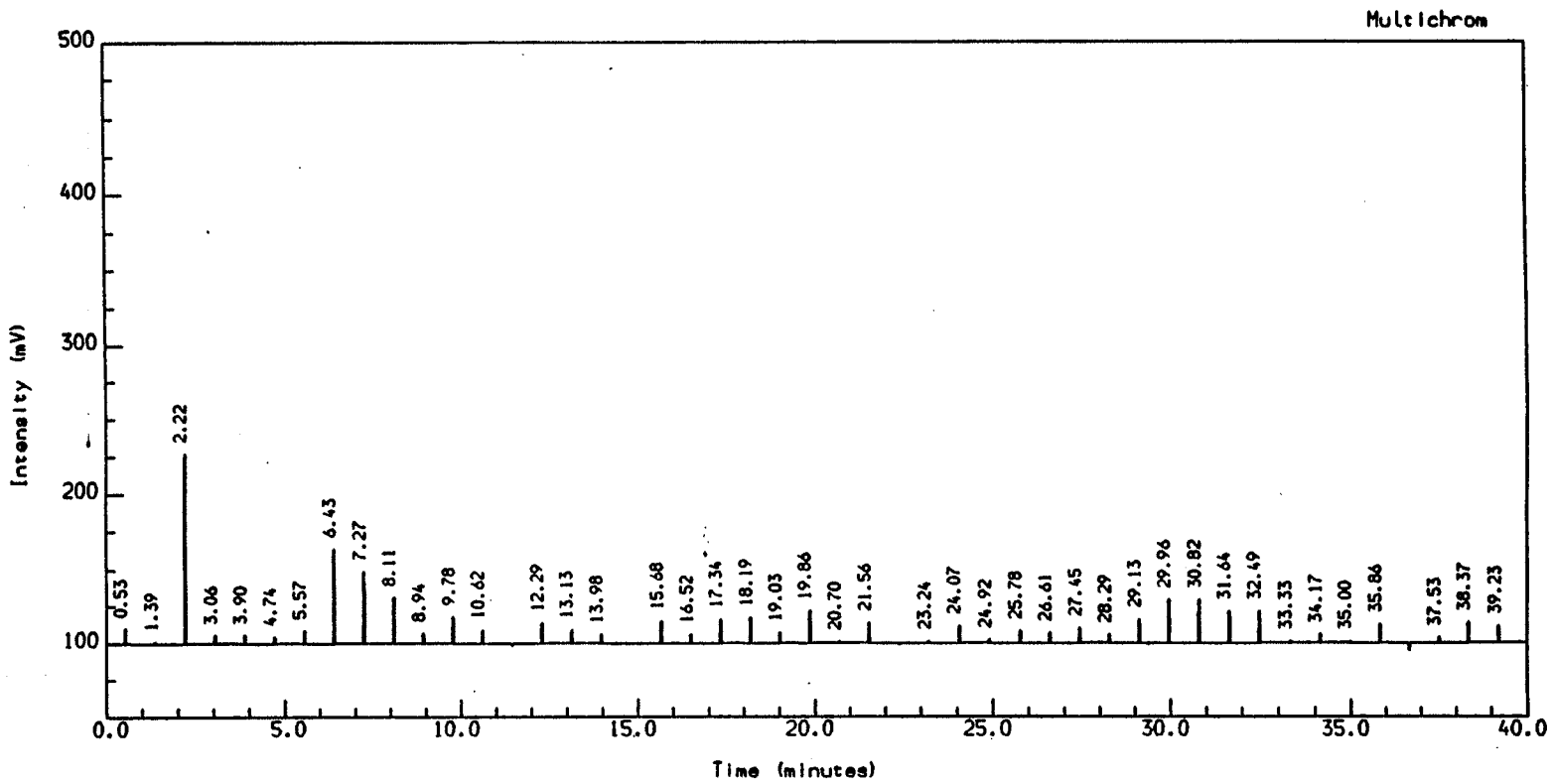
Method : 251M01-7
Calibration :
Run Sequence : 251M01-7

S ple 3-B-0: 50 ug/L As as senite added.

EPL Bio-Analytical Services - Multichrom 2 V2.0, node ERNIE

Analysis Name : [TEST] 16 251M01-3,9,1.

251M01SPKAS3 Amount : 1.000



Sample 1-B-0: 50 ug/L As as sodium arsenite added.

Instrument :

Channel Title : Channel #16

Lims ID :

Acquired on 17-MAY-1994 at 01:51

Reported on 26-JUL-1994 at 09:07

Method : 251M01-3

Calibration :

Run Sequence : 251M01-3

Appendix B

Sample Chromatograms

ATTACHMENT 6

AMOCO OIL COMPANY - WHITING REFINERY

BIOLOGICAL TEST DATA

ATTACHMENT 6-1. AMOCO OUTFALL OO1 ACUTE BIOASSAY RESULTS

SAMPLE COLLECTION DATE	TEST ORGANISM	LC50 %
06/22/92	Ceriodaphnia dubia	> 100 at 48 hours
	Fathead Minnow	> 100 at 96 hours

Notes:

LC50 – Effluent Concentration lethal to 50 percent of the organisms within test period, normally calculated useing Trimmed Spearman-Karber method.

"%" – Percent Effluent Concentration

REF: USEPA, 1991, "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition", 600/4-90/027.

ATTACHMENT 6-2. AMOCO OUTFALL 001 CHRONIC BIOASSAY RESULTS

SAMPLE COLLECTION DATE	TEST ORGANISM	TOXICITY TEST ENDPOINTS						
			SURVIVAL		REPRODUCTION		GROWTH	
		IC25 (%)	LOEC (%)	NOEC (%)	LOEC (%)	NOEC (%)	LOEC (%)	NOEC (%)
06/09/91	Ceriodaphnia dubia	53.2	100	50	100	50	NA	NA
	Fathead Minnow	8.5	100	50	NA	NA	6.25	< 6.25
06/16/91	Ceriodaphnia dubia	64.7	> 100	100	100	50	NA	NA
	Fathead Minnow	43.8	> 100	100	NA	NA	50	25
06/23/91	Ceriodaphnia dubia	> 100	> 100	100	> 100	100	NA	NA
	Fathead Minnow	29.3	> 100	100	NA	NA	50	25
07/07/91	Ceriodaphnia dubia	> 100	> 100	100	> 100	100	NA	NA
09/16/91	Ceriodaphnia dubia	17.6	100	50	25	12.5	NA	NA
12/29/91	Ceriodaphnia dubia	58.2	100	50	100	50	NA	NA
	Fathead Minnow	35.8	100	50	NA	NA	50	25
03/01/92	Ceriodaphnia dubia	76.2	>100	100	>100	100	NA	NA
	Fathead Minnow	43.6	100	50	NA	NA	100	50
03/08/92	Ceriodaphnia dubia	62.5	100	50	100	50	NA	NA
	Fathead Minnow	52.8	100	50	NA	NA	100	50
04/19/92	Fathead Minnow	> 100	> 100	100	NA	NA	> 100	100

Notes:

NA – Not applicable endpoint for species.

IC25 – Inhibition Concentration estimated to cause a 25% reduction in a biological measurement. Calculated using Biomass Method, accounts for both survival and reproduction or growth response.

LOEC – Lowest Observed Effect Concentration, calculated using statistical package "TOXSTAT", D. Gulley, University of Wyoming

NOEC – No Observed Effect Concentration, calculated using statistical package "TOXSTAT", D. Gulley, University of Wyoming

"%" – Percent Effluent Concentration

REF: USEPA, 1989, "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms", 600/4-89-001.

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QUALITY CONTROL INFORMATION

BIOLOGICAL TEST DATA

Fathead Minnow CHRONIC REFERENCE TOXICANT TESTING - SODIUM CHLORIDE (NaCl) 1992

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	IC25 (mg/L)	Coeff of Var (%)	SURVIVAL		GROWTH	
							NOEC (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOEC (mg/L)
1	1334	01 Apr 92	Mod Hd	95	4400	0.00	4000	6000	4000	6000
2	1344	07 Apr 92	Mod Hd	85	4700	4.66	4000	6000	4000	6000
3	1357	21 Apr 92	Mod Hd	100	5100	7.42	4000	6000	4000	6000
4	1369	28 Apr 92	Mod Hd	98	3200	18.82	4000	6000	2000	4000
5	1396	15 May 92	Mod Hd	100	4800	16.60	2000	4000	2000	4000
6	1404	03 Jun 92	Mod Hd	100	2700	23.35	4000	6000	4000	6000
7	1444	07 Jul 92	Mod Hd	95	4700	21.49	4000	6000	4000	6000
8	1490	18 Aug 92	Mod Hd	100	4300	19.86	4000	6000	4000	6000
9	1522	14 Sept 92	Mod Hd	98	1400	31.38	4000	6000	4000	6000
10	1561	18 Nov 92	Mod Hd	98	1600	37.21	4000	6000	4000	6000
			Avg	97	3690	18	3800	5800	3600	5600

NOTES:
IC25 - Survival and reproduction inhibition concentration to 25 percent of the test organisms.
NOEC - No Observable Effect Concentration (survival or growth)
LOEC - Lowest Observable Effect Concentration (survival or growth)

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Fathead Minnow ACUTE REFERENCE TOXICITY TESTING - Sodium Chloride (NaCl) 1992

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	48-hr LC50 (mg/L)	95% Confidence Intervals	LC50 Cumulative Mean (mg/L)	LC50 Cumulative St. Dev. (mg/L)	Coefficient of Variation (%)
1	1075	15 Jan 92	Mod Hard	85	7,360	6730-8060	7,360	0	0
2	1089	20 Jan 92	Mod Hard	90	7,870	7430-8330	7,615	361	3
3	1193	13 Feb 92	Mod Hard	90	7,970	7530-8440	7,733	327	3
4	1198	17 Feb 92	Mod Hard	100	7,740	7240-8270	7,735	267	3
5	1298	25 Mar 92	Mod Hard	100	9,410	8820-1004	8,070	784	9
6	1320	30 Mar 92	Mod Hard	100	8,030	7530-8570	8,063	701	8
7	1362	21 Apr 92	Mod Hard	100	8,600	8050-9180	8,140	672	8
8	1370	28 Apr 92	Mod Hard	100	6,770	6230-7360	7,969	788	9
9	1379	11 May 92	Mod Hard	95	5,670	5190-6200	7,713	1,063	13
10	1466	27 Jul 92	Mod Hard	100	7,480	7100-7880	7,690	1,005	12
11	1520	29 Sep 92	Mod Hard	100	6,930	6780-7080	7,621	981	12
12	1550	15 Oct 92	Mod Hard	100	6,140	5700-6610	7,498	1,028	13
13	1563	18 Nov 92	Mod Hard	95	4,280	NC	7,250	1,329	18
14	1565	25 Nov 92	Mod Hard	95	6,550	6120-7000	7,200	1,290	17
15	1571	03 Dec 92	Mod Hard	90	5,010	4540-5540	7,054	1,366	19
16	1582	17 Dec 92	Mod Hard	100	5,900	5440-6400	6,982	1,351	19

NOTES:

LC50 - Concentration of sodium chloride which was lethal to 50 percent of the test organisms.

NC - Not calculable

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Ceriodaphnia dubia CHRONIC REFERENCE TOXICANT TESTING - SODIUM CHLORIDE (NaCl) 1992

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	IC25 (mg/L)	Coeff of Var (%)	SURVIVAL NOEC (mg/L)	SURVIVAL LOEC (mg/L)	REPRO NOEC (mg/L)	REPRO LOEC (mg/L)
1	1134	29 Jan 92	Mod Hd	100	400	0.00	1,000	2,000	1,000	2,000
2	1190	12 Feb 92	Mod Hd	90	400	0.00	500	1,000	500	1,000
3	1218	4 Mar 92	Soft	100	500	13.32	1,000	2,000	500	1,000
4	1303	25 Mar 92	Mod Hd	100	900	43.28	1,000	2,000	1,000	2,000
5	1302	26 Mar 92	Soft	100	800	39.09	1,000	2,000	1,000	2,000
6	1413	3 Jun 92	Mod Hd	100	1,100	42.83	1,000	2,000	500	1,000
7	1433	24 Jun 92	Mod Hd	100	800	38.69	1,000	2,000	1,000	2,000
8	1482	9 Aug 92	Mod Hd	100	300	44.28	250	500	250	250
9	1492	10 Aug 92	Mod Hd	100	200	51.37	250	500	< 250	500
10	1493	19 Aug 92	Soft	100	400	51.28	1,000	2,000	250	500
11	1535	14 Oct 92	Mod Hd	90	300	53.11	1,000	2,000	< 250	250
12	1577	9 Dec 92	Soft	92	100	59.99	500	1,000	< 250	250
13	1580	16 Dec 92	Soft	90	500	57.58	1000	2000	1000	2000
			Avg	97	515	38	808	1615	596	1135

NOTES:
IC25 - Survival and reproduction inhibition concentration to 25 percent of the test organisms.
NOEC - No Observable Effect Concentration (survival or reproduction)
LOEC - Lowest Observable Effect Concentration (survival or reproduction)

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Ceriodaphnia dubia ACUTE REFERENCE TOXICANT TESTING - SODIUM CHLORIDE (NaCl) 1992

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	48-hr LC50 (mg/L)	95% Confidence Intervals	LC50 Cumulative Mean (mg/L)	LC50 Cumulative St. Dev. (mg/L)	Coefficient of Variation (%)
1	1076	15 Jan 92	Mod Hard	100	2,550	2280-2850	2,550	NC	NC
2	1191	13 Feb 92	Mod Hard	100		NC	2,550	NC	NC
3	1301	25 Mar 92	Mod Hard	100		NC	2,550	0	0
4	1401	29 May 92	Mod Hard	85	2,000	1700-2350	2,275	389	12
5	1433	20 Jun 92	Mod Hard	100		NC	2,275	389	12
6	1479	31 Jul 92	Mod Hard	100	2,210	1820-2670	2,253	278	10
7	1487	04 Aug 92	Mod Hard	90	1,210	780-1880	1,993	569	25
8	1521	29 Sep 92	Mod Hard	95	1,870	1580-2210	1,968	496	23
9	1536	14 Oct 92	Mod Hard	100	2,780	NC	2,103	554	24
10	1559	17 Nov 92	Mod Hard	90	1,740	1460-2080	2,051	524	24
11	1588	06 Jan 93	Mod Hard	100	2,000	NC	2,045	485	22

NOTES:
LC50 - Concentration of sodium chloride which was lethal to 50 percent of the test organisms.
NC - Not calculable
Tests 2, 3 and 5 were 24 hour tests ; therefore a 48 hour LC50 could not be calculated.

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Ceriodaphnia dubia CHRONIC REFERENCE TOXICANT TESTING – SODIUM CHLORIDE (NaCl) 199 l

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	IC25 (mg/L)	Coeff of Var (%)	SURVIVAL NOEC (mg/L)	SURVIVAL LOEC (mg/L)	REPRO NOEC (mg/L)	REPRO LOEC (mg/L)
1	460	10 Apr 91	Mod Hd	100	1,180	0.00	1,000	2,000	1,000	2,000
2	465	17 Apr 91	Mod Hd	100	622	43.79	500	1,000	500	1,000
3	488	15 May 91	Mod Hd	100	357	58.37	1,000	2,000	250	500
4	497	29 May 91	Mod Hd	100	609	50.21	1,000	2,000	500	1,000
5	554	19 Jun 91	Mod Hd	100	187	63.66	1,000	2,000	500	1,000
6	564	26 Jun 91	Mod Hd	100	828	55.53	1,000	2,000	500	1,000
7	660	31 Jun 91	Mod Hd	100	136	66.14	1,000	2,000	500	1,000
8	684	21 Aug 91	Mod Hd	80	578	60.99	2,000	> 2,000	1,000	2,000
9	815	11 Nov 91	Mod Hd	90	428	59.17	500	1,000	500	1,000
			Avg	97	547	51	1000	1556	583	1167

NOTES:
IC25 – Survival and reproduction inhibition concentration to 25 percent of the test organisms.
NOEC – No Observable Effect Concentration (survival or reproduction)
LOEC – Lowest Observable Effect Concentration (survival or reproduction)

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Ceriodaphnia dubia ACUTE REFERENCE TOXICANT TESTING – SODIUM CHLORIDE (NaCl) 1991

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	24-hr LC50 (mg/L)	95% Confidence Intervals	LC50 Cumulative Mean (mg/L)	LC50 Cumulative St. Dev. (mg/L)	Coefficient of Variation (%)
1	412	15 Jan 91	Mod Hard	100	2,830	NC	2,830	0	0
2	462	10 Apr 91	Mod Hard	100	2,300	1990 – 2650	2,565	375	10
3	491	23 May 91	Mod Hard	95	3,110	2600 – 3720	2,747	411	12
4	504	31 May 91	Mod Hard	100	2,640	2400 – 2900	2,720	340	11
5	555	19 Jun 91	Mod Hard	100	2,300	1990 – 2650	2,636	349	12
6	660	31 Jul 91	Mod Hard	100	2,140	1840 – 2500	2,553	372	13
7	691	23 Aug 91	Mod Hard	100	4,000	NC	2,760	644	22
8	760	08 Oct 91	Mod Hard	100	2,220	2270 – 2880	2,693	626	22
9	809	05 Nov 91	Mod Hard	100	2,670	1880 – 2620	2,690	586	21
10	943	10 Dec 91	Mod Hard	100	2,940	NC	2,715	558	19
			AVG	100	2,715	NA	2,691	473	16

NOTES:

LC50 – Concentration of sodium chloride which was lethal to 50 percent of the test organisms.

NC – Not calculable

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Fathead minnow ACUTE REFERENCE TOXICANT TESTING – SODIUM CHLORIDE (NaCl) 1991

Test Number	Log Number	Test Initiation Date	Control Water	Control Survival (%)	48-hr LC50 (mg/L)	95% Confidence Intervals	LC50 Cumulative Mean (mg/L)	LC50 Cumulative St. Dev. (mg/L)	Coefficient of Variation (%)
1	408	11 Jan 91	Mod Hard	100	6,510	NC	6,510	0	0
2	416	22 Jan 91	Mod Hard	100	7,870	7430 – 8330	7,190	962	9
3	435	01 Mar 91	Mod Hard	100	7,870	7430 – 8330	7,417	785	9
4	461	10 Apr 91	Mod Hard	100	8,000	7460 – 8580	7,563	704	8
5	476	01 May 91	Mod Hard	100	6,140	5700 – 6610	7,278	881	11
6	485	15 May 91	Mod Hard	100	8,090	7680 –8530	7,413	855	11
7	486	15 May 91	Mod Hard	100	8,530	8070 – 9020	7,573	887	11
8	496	28 May 91	Mod Hard	100	6,930	NC	7,493	852	11
9	506	31 May 91	Mod Hard	100	8,280	7860 – 8730	7,580	840	10
10	507	04 Jun 91	Mod Hard	100	7,970	7530 – 8440	7,619	801	10
11	508	04 Jun 91	Mod Hard	100	7,870	7430 – 8330	7,642	764	10
12	509	04 Jun 91	Mod Hard	100	7,290	6970 – 7630	7,613	735	9
13	518	05 Jun 91	Mod Hard	100	6,870	6480 – 7270	7,555	733	9
14	519	05 Jun 91	Mod Hard	100	6,830	6380 – 7320	7,504	731	9
15	520	05 Jun 91	Mod Hard	100	6,550	6120 – 7000	7,440	746	10
16	543	12 Jun 91	Mod Hard	100	8,940	8630 – 9270	7,534	812	10
17	544	12 Jun 91	Mod Hard	100	8,280	7860 – 8730	7,578	807	10
18	542	12 Jun 91	Mod Hard	100	7,250	6780 – 7750	7,559	787	10
19	566	27 Jun 91	Mod Hard	90	8,880	8340 – 9470	7,629	823	10
20	567	27 Jun 91	Mod Hard	100	7,870	7430 – 8330	7,641	802	10
21	565	27 Jun 91	Mod Hard	100	8,570	7450 – 9880	7,685	808	10
22	587	08 Jul 91	Mod Hard	100	6,810	6580 – 7040	7,645	810	10
23	588	08 Jul 91	Mod Hard	100	6,930	NC	7,614	806	10
24	589	08 Jul 91	Mod Hard	100	8,860	8290 – 9460	7,666	828	11
25	622	17 Jul 91	Mod Hard	100	6,560	6190 – 6950	7,622	840	11
26	623	17 Jul 91	Mod Hard	100	6,160	5640 – 6720	7,586	872	11
27	624	17 Jul 91	Mod Hard	100	6,460	6080 – 6880	7,525	881	11
28	625	17 Jul 91	Mod Hard	95	6,740	6170 – 7360	7,497	877	11
29	626	17 Jul 91	Mod Hard	100	7,340	6810 – 7900	7,491	862	11
30	627	17 Jul 91	Mod Hard	100	5,830	5390 – 5300	7,436	899	12
31	678	07 Aug 91	Mod Hard	100	6,550	6270 – 7060	7,407	896	12
32	679	07 Aug 91	Mod Hard	100	5,270	4880 – 5680	7,341	961	13
33	680	07 Aug 91	Mod Hard	100	5,410	5050 – 5790	7,282	1,004	14
34	764	07 Oct 91	Mod Hard	95	8,470	7210 – 8470	7,317	1,009	14

NOTES:

LC50 – Concentration of sodium chloride which was lethal to 50 percent of the test organisms.

NC – Not calculable

The average age of fatheads tested = 17.5 days

C:\DATA\3149\JUN94\91PAFMA.WK1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
CINCINNATI, OHIO 45268

DATE: August 19, 1993

SUBJECT: Discharge Monitoring Report - Quality Assurance (DMR-QA) Study 13 Laboratory Performance Evaluation Whole Effluent Toxicity Results

TO: Biomonitoring Support Laboratories

FROM: for Ted Coopwood
Office of Wastewater Enforcement
and Compliance (EN-338) RWB

Thank you for your cooperation and support in providing toxicity data to EMSL-CI and the permittees within the National Pollution Discharge Elimination System (NPDES), for the 1993 DMR-QA program.

All of the permittees who submitted toxicity data have been sent an evaluation report and have been advised to forward a copy of their performance evaluation report to you. For your convenience, we are providing you a copy of the true values (mean values) and acceptance limits, an explanation of general terms used in the reports and the grand summary for data submitted by the biomonitoring laboratories. These limits will enable you to produce a self-evaluation of your data to see how it relates to performance by other laboratories. There will be no further information on DMR-QA Study 13 forwarded to your laboratory by the USEPA.

Any questions concerning the evaluation should be directed to me at (202) 260-8327. Again, on behalf of the USEPA, thank you for your cooperation and participation in this QA Program.

Enclosures (3):
As Stated

CC: Paul Britton
Gary Polvi
James Lazorchak
Michele Shirley

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TABLE 1. RESULTS OF EPA DMR–QA STUDY NO. 13 (1993) – ECOTOXICOLOGY SERVICES GROUP

ORGANISM	TEST TYPE	ENDPOINT	NO. OF LABS PARTICIPATING	EPA 95% ACCEPTANCE LIMITS	EPA VALUE	ADVENT RESULT
Fathead Minnow	48–hr Acute	LC50	162	5.7 – 73.2	39.4	35.4
Fathead Minnow	7–day Chronic	Survival, NOEC	146	12.5 – 50.0	25.0	25.0
Fathead Minnow	7–day Chronic	Growth, IC25	139	3.5 – 64.3	33.9	55.7
Fathead Minnow	7–day Chronic	Growth, NOEC	146	12.5 – 50.0	25.0	25.0
Ceriodaphnia dubia	48–hr Acute	LC50	73	D.L. – 56.3	27.9	12.6
Ceriodaphnia dubia	7–day Chronic	Survival, NOEC	133	25.0–100	50.0	50.0
Ceriodaphnia dubia	7–day Chronic	Repro, IC25	128	D.L. – 48.9	20.3	9.10
Ceriodaphnia dubia	7–day Chronic	Repro, NOEC	133	6.25 – 25.0	12.5	12.5
Daphnia magna	48–hr Acute	LC50	60	6.4 – 96.0	51.2	43.1
Mysidopsis bahia	48–hr Acute	LC50	65	6.25 – 25.0	36.9	35.4
Sheepshead Minnow	48–hr Acute	LC50	35	D.L. – 100	58.0	>100

Values given are percent of sample.
D.L. – Detection Limit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
CINCINNATI, OHIO 45268

DATE: August 19, 1992

SUBJECT: Discharge Monitoring Report - Quality Assurance (DMR-QA) Study 12 Laboratory Performance Evaluation Whole Effluent Toxicity Results

TO: Biomonitoring Support Laboratories

FROM: for Ted Coopwood
Office of Wastewater Enforcement
and Compliance (EN-338)

Thank you for your cooperation and support in providing toxicity data to EMSL-CI and the permittees within the National Pollution Discharge Elimination System (NPDES), for the 1992 DMR-QA program.

All of the permittees who submitted toxicity data have been sent an evaluation report and have been advised to forward a copy of their performance evaluation report to you. For your convenience, we are providing you a copy of the true values (mean values) and acceptance limits, an explanation of general terms used in the reports and the grand summary for data submitted by the biomonitoring laboratories. These limits will enable you to produce a self-evaluation of your data to see how it relates to performance by other laboratories. There will be no further information on DMR-QA Study 12 forwarded to your laboratory by the USEPA.

Any questions concerning the evaluation should be directed to me at (202) 260-8327. Again, on behalf of the USEPA, thank you for your cooperation and participation in this QA Program.

Enclosures (3):
As Stated

Printed on Recycled Paper

TABLE 2. RESULTS OF EPA DMR–QA STUDY NO. 12 (1992) – ECOTOXICOLOGY SERVICES GROUP

ORGANISM	TEST TYPE	ENDPOINT	NO. OF LABS PARTICIPATING	EPA 95% ACCEPTANCE LIMITS	EPA VALUE	ADVENT RESULT
Fathead Minnow	96–hr Acute	LC50	123	21.9 – 57.6	39.7	34.1
Fathead Minnow	7–day Chronic	Survival, NOEC	115	12.4 – 50.1	26.0	25.0
Fathead Minnow	7–day Chronic	Growth, IC25	99	16.0 – 50.1	33.1	32.1
Fathead Minnow	7–day Chronic	Growth, NOEC	111	12.4 – 50.1	24.9	25.0
Ceriodaphnia dubia	48–hr Acute	LC50	66	17.4 – 82.5	50.0	33.9
Ceriodaphnia dubia	7–day Chronic	Survival, NOEC	107	4.6 – 53.4	29.0	25.0
Ceriodaphnia dubia	7–day Chronic	Repro, IC25	101	D.L. – 51.5	24.1	22.7
Ceriodaphnia dubia	7–day Chronic	Repro, NOEC	105	D.L.– 39.6	17.8	25.0
Daphnia magna	48–hr Acute	LC50	41	55.1 – 91.1	73.1	77.1

Values given are percent of sample.
D.L. – Detection Limit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
CINCINNATI, OHIO 45268

DATE: August 15, 1991

SUBJECT: DMR-QA STUDY 11 Laboratory Performance Evaluation
Whole Effluent Toxicity Results

TO: Biomonitoring Support Laboratories

FROM: Cornelius I. Weber, Ph. D.
Technical Advisor
Quality Assurance Research Division

Thank you for your cooperation and support in providing toxicity data to EMSL-CI and the permittees within the National Pollution Discharge Elimination System (NPDES), for the 1991 Discharge Monitoring Report (DMR) Quality Assurance (QA) program.

All of the permittees who submitted toxicity data have been sent an evaluation report, and have been instructed to forward a copy of their performance evaluation report to you. For your convenience we are providing you with a copy of the true values (mean values) and acceptance limits, along with an explanation of general terms used in the reports. For your further information, we have also enclosed a preliminary report containing the basis of the statistical results for the program. Although this is a preliminary report to OWEC, it contains all of the information you will require to perform a self-evaluation and make a comparison of your laboratories performance to the performance of other laboratories in the program. There will be no further information forwarded to your laboratory.

Any questions concerning the evaluation should be directed to Cornelius I. Weber at (513)533-8114. Again, on behalf of the USEPA, thank you for your cooperation and participation in this QA Program.

Enclosures

TABLE 3. RESULTS OF EPA DMR–QA STUDY NO. 11 (AUGUST 1991) – ECOTOXICOLGY SERVICES GROUP

ORGANISM	TEST TYPE	ENDPOINT	NO. OF LABS PARTICIPATING	EPA 99% (C.I.) ACCEPTANCE LIMITS	EPA 95% (C.I.) WARNING LIMITS	EPA VALUE	ADVENT RESULT
Fathead Minnow	Acute	LC50	203	1.44 – 9.81	2.45 –8.8	5.63	7.94
Fathead Minnow	Chronic	Survival, NOEC	146	0.403 – 5.74	1.05 – 5.09	3.07	3.13
Fathead Minnow	Chronic	Growth, IC25	124	D.L. – 9.58	2.32 – 10.4	4.67	6.5
Fathead Minnow	Chronic	Growth, IC50	117	1.01 – 11.7	2.32 – 10.4	6.36	8.5
Fathead Minnow	Chronic	Growth, NOEC	142	D.L. – 7.91	D.L. – 6.77	3.2	6.25
Ceriodaphnia	Acute	LC50	171	D.L. – 10.4	1.10 – 9.15	5.12	2.88
Ceriodaphnia	Chronic	Survival, NOEC	162	D.L. – 8.55	D.L. – 7.33	3.51	3.13
Ceriodaphnia	Chronic	Reproduction, IC25	155	D.L. – 7.81	D.L. – 6.57	2.69	1.96
Ceriodaphnia	Chronic	Reproduction, IC50	150	D.L. – 10.2	D.L. – 8.66	3.99	2.73
Ceriodaphnia	Chronic	Reproduction, NOEC	156	D.L. – 6.78	D.L. – 5.68	2.24	1.56

The State of North Carolina • Department of Environment, Health, and Natural Resources

Division of Environmental Management
Biological Laboratory Certification Program
In accordance with the provisions of NCGS: 143-215(a) (10) and 15 NCAC 2H.1100

Does Hereby Certify That

The Advent Group, Inc.

has successfully demonstrated capability and proficiency in performing biological analyses for certified parameters and, therefore, is qualified to report biological monitoring data to the Division of Environmental Management for compliance with National Pollutant Discharge Elimination System regulations.

This certificate does not guarantee validity of all generated data. Certification does indicate that the methodology, equipment, quality control procedures, records and the laboratory's proficiency in biological sampling and/ or analyses have been examined and determined acceptable.

003
Biological Certificate Number

November 1, 1993
This Certificate Shall Be Valid Until Date Above

Signed

Water Quality Section Chief
Title

The State of North Carolina • Department of Environment, Health, and Natural Resources

Division of Environmental Management
Biological Laboratory Certification Program
In accordance with the provisions of NCGS: 143-215(a) (10) and 15 NCAC 2H.1100

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003
Biological Certificate Number

November 1, 1992
This Certificate Shall Be Valid Until Date Above

Signed

Water Quality Section Chief
Title

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Environmental Management
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

George T. Everett, Ph.D.
Director

March 8, 1991

Mr. Carl M. Crane
The Advent Group, Inc.
201 Summit View Dr., Suite 313
Brentwood, Tennessee 37027

Mr. Crane:

Please find enclosed summaries of the results of the December 1990 performance evaluation samples shipped to North Carolina Division of Environmental Management certified biological laboratories. The overall results obtained from this series of analyses were very positive.

Samples were shipped to be analyzed for fathead minnow acute toxicity, *Ceriodaphnia dubia* acute toxicity, and *Ceriodaphnia dubia* chronic toxicity. Fifteen laboratories and the State lab participated in the *Ceriodaphnia dubia* acute and chronic series. Ten laboratories and the State lab evaluated acute testing samples with fathead minnows. Your laboratory is represented as number 7 on the attached summary sheets.

Results of the *Ceriodaphnia dubia* acute testing are summarized graphically on Attachment 1 with LC_{50} values listed on Attachment 2. Laboratories recording LC_{50}s outside of two standard deviations from the mean should scrutinize their records of this particular test and possibly acute invertebrate testing procedures in general. Additionally, reference toxicant records for the period in question should be examined. Those labs which produced LC_{50}s outside of one standard deviation but within two standard deviations from the mean may find it useful examine their acute invertebrate procedures as well.

Results of the *Ceriodaphnia dubia* chronic testing are summarized graphically on Attachment 3 with numerical results listed on Attachment 4. As may have been deduced, one of the four chronic samples was intended to be acutely "toxic" while the other three were "non-toxic." This test was designed to show effectiveness of a testing program with respect to intra-lab replication of results, sample tracking, appropriate randomization, and inter-lab ability to achieve similar results in the single concentration analysis Attachment 3 charts each lab's average young reproduction for the three samples. Those with resulting neonate averages of less than 15 per female or with less than 80% survival of adults should examine these particular tests and their invertebrate chronic test programs as described above.

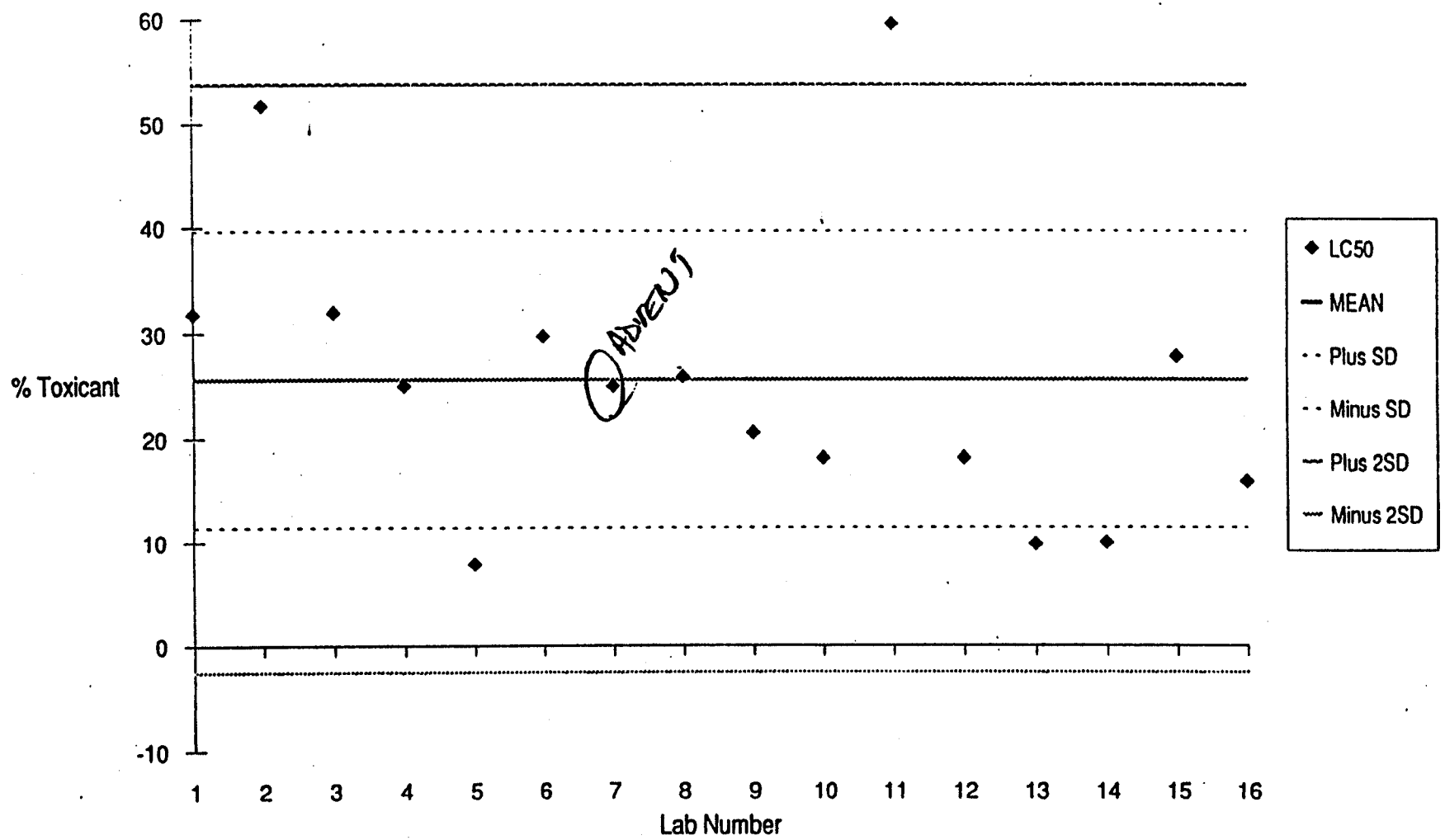
The fathead minnow acute test results are summarized on Attachment 2. One sample was intended to be acutely "toxic" and one sample was not. Again, this analysis was designed to look at inter-lab variability of results in the single concentration analysis and sample tracking. All participating laboratories reported expected results in this analysis.

If there are any questions, please contact me or Matt Matthews at (919) 733-2136.

Sincerely,

Larry Ausley
Supervisor, Aquatic Toxicology Unit

Attachment 1. 1990 Acute Performance Evaluation Results



Attachment 2. Results from Acute Performance Evaluation Tests

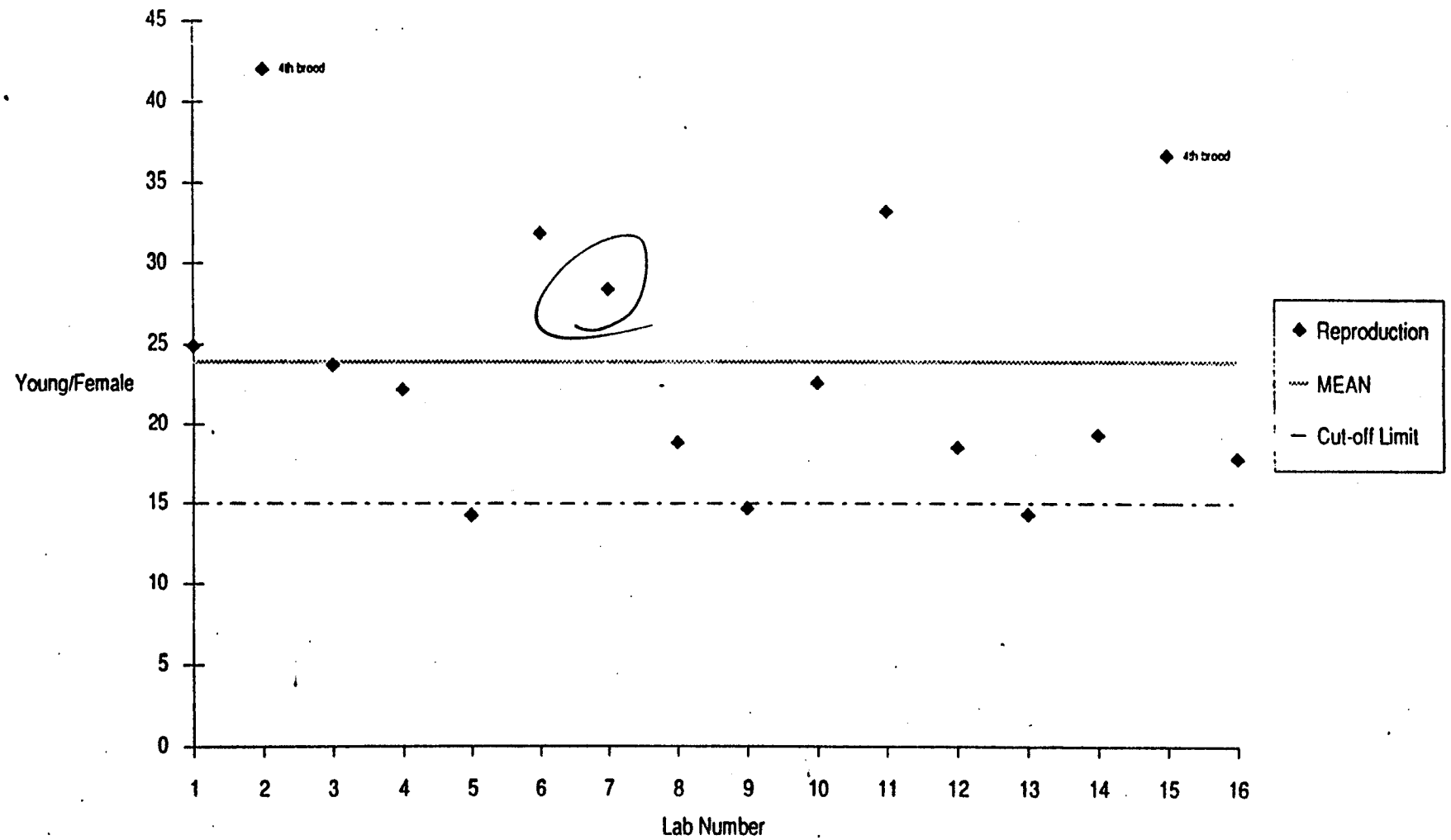
Lab #	Sample "E" LC50	Expected "F" Result Obtained?	Expected "G" Result Obtained?
1	31.8%	---	---
2	51.7%	yes	yes
3	32.0%	---	---
4	25.0%	yes	yes
5	7.9%	yes	yes
6	29.7%	---	---
ADVENT 7	25.0%	yes	yes
8	25.9%	yes	yes
9	20.5%	yes	yes
10	18.2%	yes	yes
11	59.6%	yes	yes
12	18.1%	yes	yes
13	9.8%	yes	yes
14	10.0%	---	---
15	27.8%	---	---
16	15.9%	yes	yes

Average of LC50 values for Sample "E" = 25.5%.
Average plus two standard deviations = 53.7%.
Average minus two standard deviations = -2.6%.

" ---" Lab did not perform this analysis.

Sample Key:
"E" = Ceriodaphnia dubia multiple concentration test
"F" = Fathead minnow pass/fail test
"G" = Fathead minnow pass/fail test

Attachment 3. 1990 Performance Evaluation Series: Average Reproduction for Pooled Data



Attachment 4. Results from Chronic Performance Evaluation Tests

Lab	Sample "A"		Sample "B"		Sample "C"		Sample "D"		Pooled
#	repro.	mort.	repro.	mort.	repro.	mort.	repro.	mort.	repro.
1	26.0	0%	25.5	0%	0.0	100%	23.3	0%	24.9
2	33.2	0%	46.0	0%	0.0	100%	46.9	0%	42.0
3	25.0	0%	23.0	0%	0.0	100%	23.3	0%	23.8
4	23.7	0%	20.7	10%	0.0	100%	22.3	0%	22.2
5	15.0	20%	15.2	30%	0.0	100%	12.7	30%	14.3
6	33.4	0%	32.6	0%	0.0	100%	29.6	0%	31.9
OVERUT 7	26.9	10%	29.8	10%	0.0	100%	28.5	0%	28.4
8	20.7	20%	17.7	10%	0.0	100%	18.2	20%	18.9
9	15.5	0%	14.4	0%	0.0	100%	14.2	0%	14.7
10	24.6	0%	22.4	0%	0.0	100%	20.9	0%	22.6
11	30.3	10%	35.9	0%	0.0	100%	33.5	0%	33.2
12	18.1	10%	18.9	0%	0.0	100%	18.6	0%	18.5
13	18.3	0%	13.3	10%	0.0	100%	11.4	0%	14.3
14	19.8	0%	18.0	0%	0.0	100%	20.2	0%	19.3
15	38.9	0%	36.6	0%	0.0	100%	34.4	0%	36.6
16	19.7	0%	18.9	0%	0.0	100%	14.8	0%	17.8

Each set contains 10 organisms. No missing values or males reported.

Shaded values do not meet criteria for acceptable test "control" results (≤20% mortality; ≥15 young/female).

† Reported reproduction to 4th brood for majority of test organisms.

†† Reported reproduction to 2nd brood for majority of test organisms.

SUPPLEMENTAL INFORMATION

WATER ADDITIVE DATA

WATER ADDITIVE MSDS's

ZEBRA MUSSEL CONTROL PROGRAM

Water Additives Data

Unit	Chemical	Dosage
Power Stations	Nalco 7206T	7.0 ppm
	Nalco 1740	6.0 ppm
	Nalco 2	15.0 ppm
	Nalco 1720	14.0 ppm
	Nalco CA669A	4.5 ppm
	Nalco 1825 (OSBL)	10.0 ppm
	Nalco 1825 (3 SPS)	3.0 ppm
	Nalco 1700	3.0 ppm
	Nalco 8357	4.0 ppm
Cooling Towers	Nalco 1326	2.0 ppm
	Nalco 23230	4.0 ppm
	Nalco 8304T	50.0 ppm
	Nalco 71D5	5.0 gallons/day, as needed
	Nalco GI717	10 ppm
	Contingency basis only:	
	Acti-Brom 7342	30 ppm
	Nalco 8363	10 ppm
	Nalsperse 7308	10 ppm
12 Pipestill	Nalco 8357	3.5 ppm
11 Pipestill	Nalco 8357	3.5 ppm
PCU/SRU	Sodium Hypochlorite Solution	70 gallons/day
Amoco Chemicals	Nalco 8303	60.0 ppm
	Nalco 7356	45.0 ppm
	Nalco 71D5	5.0 gallons/day, as needed
	Sodium Hypochlorite Solution	25 gallons/day
Wastewater Treatment Plant	Callaway 3610*	140-200 cc/min
	Stockhausen K-122L*	160-200 cc/min
	Stockhausen K-230FL*	140-200 cc/min
	Stockhausen K260*	160-240 cc/min
	Stockhausen K-270*	
	- Clarifier	12 gallons/day
	- DW-3 Press	70-90 cc/min, 16-24 hrs/week
	Phosphoric Acid	63 gallons/day
	Eaglebrook FerriClear*	30-50 cc/min
	Callaway 803*	20-30 cc/min
	Caustic Solution	85,000 gallons/year, as needed

*or equivalent

Additional Information on Recirculating Water System

Hardness of Recirculating Water: 300-800 ppm
Flow of Recirculating Water System Blowdown: 1.8 mgd
Temperature of Recirculating Water System Blowdown: 100 deg. F
pH of the Recirculating Water System Blowdown: 8.0

08/23/94