Appendix B3 — Sheet 1 of 16

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.526
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D0905::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPL-1, 0.5 to 1 ft.
SAMPLED ON: 01 April 1987 AT: 08:40 Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg
Analysis date and time: 4/09/87 16:54	Quant. dil. factor = .0290
Acetone	ND <0.60
Benzene	ND <0.03
Bromodichlormethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochlormethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	ND <0.03
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) -- Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M. D. Robertson
Manager

Beverly F. Burt
SSFL Analytical Chemistry

Appendix B3 — Sheet 2 of 16

8703.526

continued

BPL-1

page 2

ANALYTICAL RESULTS FOR 8703.526

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.7
NICKEL (SW846-7420), mg/l	ND<0.05
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	16
NICKEL (SW846-7420), mg/kg	13
CHROMIUM (SW846-7190), mg/kg	14
CADMIUM (SW846-7130), mg/kg	2
LEAD (SW846-7420), mg/kg	18
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	9.8
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	492
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	2.4 identified as PCB 1254
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1
TERPHENYLS (ORTHO, META, & PARA), mg/kg (SW846-3550, MODIFIED)	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.493
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D0804::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPL-2, 1.5 ft.
SAMPLED ON: 01 April 1987 AT: hrs Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg	

Analysis date and time: 4/08/87 12:59 Quant. dil. factor = .0365

Acetone		ND <0.03
Benzene		ND <0.03
Bromodichlormethane		ND <0.03
Bromoform		ND <0.03
Bromomethane		ND <0.03
Carbon Tetrachloride		ND <0.03
Chlorobenzene		ND <0.03
Chloroethane		ND <0.03
2-Chloroethylvinyl ether		ND <0.03
Chloroform		ND <0.03
Chloromethane		ND <0.03
Dibromochlormethane		ND <0.03
1,2-Dichlorobenzene		ND <0.10
1,3-Dichlorobenzene		ND <0.10
1,4-Dichlorobenzene		ND <0.10
1,1-Dichloroethane		ND <0.03
1,2-Dichloroethane		ND <0.03
1,1-Dichloroethene		ND <0.03
trans 1,2-Dichloroethene		ND <0.03
1,2-Dichloropropane		ND <0.03
cis-1,3-Dichloropropene		ND <0.03
trans-1,3-Dichloropropene		ND <0.03
Ethyl benzene		ND <0.03
Freon-TF	6.3	
Isopropanol		ND <0.60
Methylene chloride		ND <0.03
1,1,2,2-Tetrachloroethane		ND <0.03
Tetrachloroethene	1.7	
Toluene		ND <0.03
1,1,1-Trichloroethane		TR <0.03
1,1,2-Trichloroethane		ND <0.03
Trichloroethene		TR <0.03
Trichlorofluoromethane		ND <0.03
Vinyl chloride		ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES: 1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ^^ Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M.D. Robertson
Manager

Beverly K. Hurt
SSFL Analytical Chemistry

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BPL-2
1.5 ft

8703.493
continued
page 2

ANALYTICAL RESULTS FOR 8703.493

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.2
NICKEL (SW846-7420), mg/l	0.2
CHROMIUM (SW846-7190), mg/l	0.2
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.4
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	60
NICKEL (SW846-7420), mg/kg	29
CHROMIUM (SW846-7190), mg/kg	34
CADMIUM (SW846-7130), mg/kg	2
LEAD (SW846-7420), mg/kg	14
MERCURY (SW846-7471), mg/kg	0.4

pH (SW846-9040 1:1 extract)	7.1
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	89
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550, MOD.)	1.0 identified as PCB 1254 (sample log # 8703.495)
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1 (sample log # 8703.495)
TERPHENYLS (ORTHO, META, & PARA),mg/kg PCTs (SW846-8080 + 3550, MOD)	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.527
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D1605::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPL-2, 3.5 ft to 4.0 ft
SAMPLED ON: 01 April 1987 AT: 10:31 Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg	

Sample extracted: 4/07/87
Analysis date and time: 4/16/87 13:28 Quant. dil. factor = .8330

Acetone		ND <600
Benzene		ND <15
Bromodichlormethane		ND <15
Bromoform		ND <15
Bromomethane		ND <15
Carbon Tetrachloride	500	
Chlorobenzene		ND <15
Chloroethane		ND <15
2-Chloroethylvinyl ether		ND <15
Chloroform		ND <15
Chloromethane		ND <15
Dibromochlormethane		ND <15
1,2-Dichlorobenzene		ND <15
1,3-Dichlorobenzene		ND <15
1,4-Dichlorobenzene		ND <15
1,1-Dichloroethane	430	
1,2-Dichloroethane		ND <15
1,1-Dichloroethene	90	
trans 1,2-Dichloroethene	22	
1,2-Dichloropropane		ND <15
cis-1,3-Dichloropropene		ND <15
trans-1,3-Dichloropropene		ND <15
Ethyl benzene	44	
Freon-TF	3100	
Isopropanol		ND <600
Methylene chloride		ND <15
1,1,2,2-Tetrachloroethane		ND <15
Tetrachloroethene	1200	
Toluene	800	
1,1,1-Trichloroethane	1840	
1,1,2-Trichloroethane		ND <15
Trichloroethene	740	
Trichlorofluoromethane		ND <15
Vinyl chloride		TR <15

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) '' Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M.D. Robertson
Manager

Beverly K Hurt
SSFL Analytical Chemistry

Appendix B3 — Sheet 6 of 16

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8703.527

BPL-2

3.5 - 4.0ft

continued

page 2

ANALYTICAL RESULTS FOR 8703.527

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	ND<0.05
NICKEL (SW846-7420), mg/l	0.3
CHROMIUM (SW846-7190), mg/l	3.1
CADMIUM (SW846-7130), mg/l	0.15
LEAD (SW846-7420), mg/l	2.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	39
NICKEL (SW846-7420), mg/kg	23
CHROMIUM (SW846-7190), mg/kg	710
CADMIUM (SW846-7130), mg/kg	2
LEAD (SW846-7420), mg/kg	153
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	9.5
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	3600
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	375
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	2.6 identified as PCB 1254
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	1.4 identified as Arochlor 4465
TERPHENYLs (SW846-3550, MOD.), mg/kg	880
BIPHENYL (SW846-3550, MOD.), mg/kg	102

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.494
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D1607::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPL-2, 5.5 to 6.0.ft.
SAMPLED ON: 01 April 1987 AT: 11:50 hrs , Soil Sample

VOLATILE ORGANIC COMPOUND RESULTS, mg/kg

Sample extracted: 4/3/87
Analysis date and time: 4/16/87 17:43 Quant. dil. factor = .0880

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg	
Acetone		ND <30
Benzene		ND <1.5
Bromodichlormethane		ND <1.5
Bromoform		ND <1.5
Bromomethane		ND <1.5
Carbon Tetrachloride		ND <1.5
Chlorobenzene		ND <1.5
Chloroethane		ND <1.5
2-Chloroethylvinyl ether		ND <1.5
Chloroform		ND <1.5
Chloromethane		ND <1.5
Dibromochlormethane		ND <1.5
1,2-Dichlorobenzene		ND <5.0
1,3-Dichlorobenzene		ND <5.0
1,4-Dichlorobenzene		ND <5.0
1,1-Dichloroethane	8.4	
1,2-Dichloroethane		ND <1.5
1,1-Dichloroethene		ND <1.5
trans 1,2-Dichloroethene	1.8	
1,2-Dichloropropane		ND <1.5
cis-1,3-Dichloropropene		ND <1.5
trans-1,3-Dichloropropene		ND <1.5
Ethyl benzene		ND <1.5
Freon-TF		ND <1.5
Isopropanol		ND <30
Methylene chloride		ND <1.5
1,1,2,2-Tetrachloroethane		ND <1.5
Tetrachloroethene		ND <1.5
Toluene	11	
1,1,1-Trichloroethane		ND 1.50
1,1,2-Trichloroethane		ND <1.5
Trichloroethene	34	
Trichlorofluoromethane	7.8	
Vinyl chloride		ND <1.5

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ^^ Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M. D. Robertson
Manager

Beverley K. Kert
SSFL Analytical Chemistry

Appendix B3 — Sheet 8 of 16

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BPL-2
5.5-6.0ft

8703.494
continued
page 2

ANALYTICAL RESULTS FOR 8703.494

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	ND<0.05
NICKEL (SW846-7420), mg/l	0.8
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.4
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	149	
NICKEL (SW846-7420), mg/kg	21	
CHROMIUM (SW846-7190), mg/kg	12	
CADMIUM (SW846-7130), mg/kg	2	
LEAD (SW846-7420), mg/kg	19	
MERCURY (SW846-7471), mg/kg	ND<0.1	
pH (SW846-9040 1:1 extract)	10.4	
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	144	
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	160	
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	1.1	identified as PCB 1254 (sample log # 8703.496)
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1	(sample log # 8703.496)
TERPHENYLS (ORTHO, META, & PARA),mg/kg	48	
BIPHENYL (SW846-3550, MOD.), mg/kg	35	

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.536
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D1606::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPW-3 (0.5 to 1.0 ft.)
SAMPLED ON: 02 April 1987 AT: 08:55 Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg

Sample extracted: 4/7/87
Analysis date and time: 4/16/87 16:24 Quant. dil. factor = 1.6670

Acetone	ND <600
Benzene	ND <30
Bromodichlormethane	ND <30
Bromoform	ND <30
Bromomethane	ND <30
Carbon Tetrachloride	ND <30
Chlorobenzene	ND <30
Chloroethane	ND <30
2-Chloroethylvinyl ether	ND <30
Chloroform	ND <30
Chloromethane	ND <30
Dibromochlormethane	ND <30
1,2-Dichlorobenzene	ND <100
1,3-Dichlorobenzene	ND <100
1,4-Dichlorobenzene	ND <100
1,1-Dichloroethane	ND <30
1,2-Dichloroethane	ND <30
1,1-Dichloroethene	ND <30
trans 1,2-Dichloroethene	ND <30
1,2-Dichloropropane	ND <30
cis-1,3-Dichloropropene	ND <30
trans-1,3-Dichloropropene	ND <30
Ethyl benzene	ND <30
Freon-TF	ND <30
Isopropanol	ND <600
Methylene chloride	ND <30
1,1,2,2-Tetrachloroethane	ND <30
Tetrachloroethene	ND <30
Toluene	ND <30
1,1,1-Trichloroethane	ND <30
1,1,2-Trichloroethane	ND <30
Trichloroethene	ND <30
Trichlorofluoromethane	ND <30
Vinyl chloride	ND <30

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) `` Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M.D. [signature] Manager   Beverly K Hurt SSFL Analytical Chemistry

Appendix B3 — Sheet 10 of 16

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BPW-3
0.5-1.0ft

8703.536
continued
page 2

ANALYTICAL RESULTS FOR 8703.536

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.3
NICKEL (SW846-7420), mg/l	1.1
CHROMIUM (SW846-7190), mg/l	1.5
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	6.9
MERCURY (SW846-7470), mg/l	0.01

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	159
NICKEL (SW846-7420), mg/kg	129
CHROMIUM (SW846-7190), mg/kg	320
CADMIUM (SW846-7130), mg/kg	6
LEAD (SW846-7420), mg/kg	864
MERCURY (SW846-7471), mg/kg	3.0

pH (SW846-9040 1:1 extract)	10.1
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	2600
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	202
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	2.0 identified as PCB 1254
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1
TERPHENYLS (ORTHO, META, & PARA), mg/kg (SW846-3550, MOD.)	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

Appendix B3 — Sheet 11 of 16

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.538
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D0904::D1 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPW-3 (4.5 ft.)
SAMPLED ON: 02 April 1987 AT: 13:30 Soil Sample

Analysis date and time: 4/09/87 15:56 Quant. dil. factor = .0330

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg
Acetone	ND <0.60
Benzene	ND <0.03
Bromodichlormethane	ND <0.03
Bromoform	ND <0.03
Bromomethane	ND <0.03
Carbon Tetrachloride	ND <0.03
Chlorobenzene	ND <0.03
Chloroethane	ND <0.03
2-Chloroethylvinyl ether	ND <0.03
Chloroform	ND <0.03
Chloromethane	ND <0.03
Dibromochlormethane	ND <0.03
1,2-Dichlorobenzene	ND <0.10
1,3-Dichlorobenzene	ND <0.10
1,4-Dichlorobenzene	ND <0.10
1,1-Dichloroethane	ND <0.03
1,2-Dichloroethane	ND <0.03
1,1-Dichloroethene	ND <0.03
trans 1,2-Dichloroethene	ND <0.03
1,2-Dichloropropane	ND <0.03
cis-1,3-Dichloropropene	ND <0.03
trans-1,3-Dichloropropene	ND <0.03
Ethyl benzene	ND <0.03
Freon-TF	ND <0.03
Isopropanol	ND <0.60
Methylene chloride	ND <0.03
1,1,2,2-Tetrachloroethane	ND <0.03
Tetrachloroethene	ND <0.03
Toluene	ND <0.03
1,1,1-Trichloroethane	ND <0.03
1,1,2-Trichloroethane	ND <0.03
Trichloroethene	ND <0.03
Trichlorofluoromethane	ND <0.03
Vinyl chloride	ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ** Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M. D. [signature]
Manager

Beverly R. Hurt
SSFL Analytical Chemistry

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BPW-3
4.5 ft

8703.538
continued
page 2

ANALYTICAL RESULTS FOR 8703.538

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	ND<0.05
NICKEL (SW846-7420), mg/l	ND<0.05
CHROMIUM (SW846-7190), mg/l	ND<0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	24
NICKEL (SW846-7420), mg/kg	19
CHROMIUM (SW846-7190), mg/kg	13
CADMIUM (SW846-7130), mg/kg	1
LEAD (SW846-7420), mg/kg	10
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	9.7
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	105
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	50
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	12 identified as PCB 1254
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1
TERPHENYLS (ORTHO, META, & PARA),mg/kg (SW846-3550, MOD.)	TR<10
BIPHENYL (SW846-3550, MOD.), mg/kg	TR<10

Appendix B3 — Sheet 13 of 16

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.537
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07

DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY

PHONE: 4785

MASS SPEC. FILE: >D1610::D2

DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPW-5 (3.0 ft.)
SAMPLED ON: 02 April 1987 AT: 14:35 Soil Sample

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg
Sample extracted: 4/7/87	
Analysis date and time: 4/16/87 21:33	Quant. dil. factor = 1.4000
Acetone	ND <300
Benzene	ND <15
Bromodichlormethane	ND <15
Bromoform	ND <15
Bromomethane	ND <15
Carbon Tetrachloride	ND <15
Chlorobenzene	ND <15
Chloroethane	ND <15
2-Chloroethylvinyl ether	ND <15
Chloroform	ND <15
Chloromethane	ND <15
Dibromochlormethane	ND <15
1,2-Dichlorobenzene	ND <60
1,3-Dichlorobenzene	ND <60
1,4-Dichlorobenzene	ND <60
1,1-Dichloroethane	ND <15
1,2-Dichloroethane	ND <15
1,1-Dichloroethene	ND <15
trans 1,2-Dichloroethene	ND <15
1,2-Dichloropropane	ND <15
cis-1,3-Dichloropropene	ND <15
trans-1,3-Dichloropropene	ND <15
Ethyl benzene	ND <15
Freon-TF	ND <15
Isopropanol	ND <300
Methylene chloride	ND <15
1,1,2,2-Tetrachloroethane	ND <15
Tetrachloroethene	ND <15
Toluene	ND <15
1,1,1-Trichloroethane	36
1,1,2-Trichloroethane	ND <15
Trichloroethene	22
Trichlorofluoromethane	ND <15
Vinyl chloride	ND <15

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) ** Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M. D. Robertson
Manager

Beverly K. Duert
SSFL Analytical Chemistry

Appendix B3 — Sheet 14 of 16

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BPW-5
3.0ft

8703.537

continued

page 2

ANALYTICAL RESULTS FOR 8703.537

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	0.5
NICKEL (SW846-7420), mg/l	0.2
CHROMIUM (SW846-7190), mg/l	0.05
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	43
NICKEL (SW846-7420), mg/kg	24
CHROMIUM (SW846-7190), mg/kg	34
CADMIUM (SW846-7130), mg/kg	2
LEAD (SW846-7420), mg/kg	17
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	8.9
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	24
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	ND<10
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	0.2 identified as PCB 1254
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1
TERPHENYLS (ORTHO, META, & PARA),mg/kg (SW846-3550, MOD.)	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

Appendix B3 — Sheet 15 of 16

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GAS CHROMATOGRAPH-MASS SPECTROMETER
CHEMICAL ANALYSIS
REPORT

LOG NUMBER
8703.528
page 1 of 2

TO: S. Lafflam, ext. 6163, MS LB07 DEPT/GROUP: 541

FROM: SSFL ANALYTICAL CHEMISTRY PHONE: 4785

MASS SPEC. FILE: >D1604::01 DATE DUE: 17 April 1987

SAMPLED BY: G. Foushee, Groundwater Resources Consultants, Inc.
SAMPLE DESCRIPTION: BPL-8 (3.0 to 3.5 ft.)
SAMPLED ON: 01 April 1987 AT: 14:40 Soil Sample

Sample extracted: 4/7/87
Analysis date and time: 4/16/87 12:31 Quant. dil. factor = .0340

VOLATILE ORGANIC COMPOUND	RESULTS, mg/kg	
Acetone		ND <0.60
Benzene		ND <0.03
Bromodichlormethane		ND <0.03
Bromoform		ND <0.03
Bromomethane		ND <0.03
Carbon Tetrachloride		ND <0.03
Chlorobenzene		ND <0.03
Chloroethane		ND <0.03
2-Chloroethylvinyl ether		ND <0.03
Chloroform		ND <0.03
Chloromethane		ND <0.03
Dibromochlormethane		ND <0.03
1,2-Dichlorobenzene		ND <0.10
1,3-Dichlorobenzene		ND <0.10
1,4-Dichlorobenzene		ND <0.10
1,1-Dichloroethane	1.2	
1,2-Dichloroethane		ND <0.03
1,1-Dichloroethene		ND <0.03
trans 1,2-Dichloroethene		ND <0.03
1,2-Dichloropropane		ND <0.03
cis-1,3-Dichloropropene		ND <0.03
trans-1,3-Dichloropropene		ND <0.03
Ethyl benzene		ND <0.03
Freon-TF		ND <0.03
Isopropanol		ND <0.60
Methylene chloride		ND <0.03
1,1,2,2-Tetrachloroethane		ND <0.03
Tetrachloroethene	0.6	
Toluene		ND <0.03
1,1,1-Trichloroethane		ND <0.03
1,1,2-Trichloroethane		ND <0.03
Trichloroethene	0.3	
Trichlorofluoromethane		ND <0.03
Vinyl chloride		ND <0.03

This sample was analyzed by the Purge and Trap-GC/MS techniques found in the second edition of SW-846, Methods 5030 and 8240.

NOTES:
1) ND means the pollutant was not detected above the background level and hence not quantified using EPA approved methodology.
2) TR means the pollutant was detected but was below the quantification level for Method 8240.
3) `` Quantification based on upon comparision of total ion count of the compound with that of the nearest internal standard.
4) ** Exceeds notification level in parenthesis.

APPROVED: M.D. Roberts
Manager

Beverly K. Kurt
SSFL Analytical Chemistry

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BPL-8
3.0-3.5 ft

8703.528
continued
page 2

ANALYTICAL RESULTS FOR 8703.528

WASTE EXTRACTION TEST
(WET) TITLE 22-66700
FOR METALS

COPPER (SW846-7210), mg/l	ND<0.05
NICKEL (SW846-7420), mg/l	0.3
CHROMIUM (SW846-7190), mg/l	0.15
CADMIUM (SW846-7130), mg/l	ND<0.005
LEAD (SW846-7420), mg/l	0.1
MERCURY (SW846-7470), mg/l	ND<0.0002

ACID DIGESTION FOR
METALS-SW846-3050

COPPER (SW846-7210), mg/kg	58
NICKEL (SW846-7420), mg/kg	17
CHROMIUM (SW846-7190), mg/kg	10
CADMIUM (SW846-7130), mg/kg	1
LEAD (SW846-7420), mg/kg	13
MERCURY (SW846-7471), mg/kg	ND<0.1

pH (SW846-9040 1:1 extract)	9.5
OIL AND GREASE, mg/kg (EPA 503 B, MODIFIED)	34
DIESEL FUEL, mg/kg (SW846-3550, MODIFIED)	20
POLYCHLORINATED BIPHENYLS, mg/kg PCBs (SW846-8080 + 3550)	ND<0.1
POLYCHLORINATED TERPHENYLS, mg/kg PCTs (SW846-8080 + 3550, MOD.)	ND<0.1
TERPHENYLs (ORTHO, META, & PARA),mg/kg (SW846-3550, MODIFIED)	ND<10
BIPHENYL (SW846-3550, MOD.), mg/kg	ND<10

Appendix B4

SSFL Analytical Chemistry Laboratory Certification

Appendix B4 — Sheet 1 of 6

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

HAZARDOUS WASTE TESTING LABORATORY CERTIFICATE

is hereby granted to

ROCKETDYNE DIVISION OF ROCKWELL INTERNATIONAL

to conduct analysis of hazardous waste in the following test categories:

PARTIAL ORGANIC CHEMICAL ANALYSIS
PARTIAL INORGANIC CHEMICAL ANALYSIS
PHYSICAL PROPERTY TESTING
CALIFORNIA WASTE EXTRACTION TEST

This Certificate is granted in accordance with provisions of Article 8.5, Chapter 6.5, Division 20 of the Health and Safety Code.

Certificate No. 120
Expiration Date APRIL 3, 1988

THE GREAT SEAL OF THE STATE OF CALIFORNIA

Issued at Berkeley, on APRIL 4, 1986
by
Chief, Hazardous Materials Laboratory Section

Appendix B4 — Sheet 2 of 6

EXPIRES:
Dec. 31, 1987

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH
LABORATORY SERVICES
SANITATION AND RADIATION LABORATORY

APPROVED WATER LABORATORY

Rockwell International Corporation
Rocketdyne Division

is hereby approved as a ....non-commercial.......... water laboratory for the performance of analytical examinations as follows:

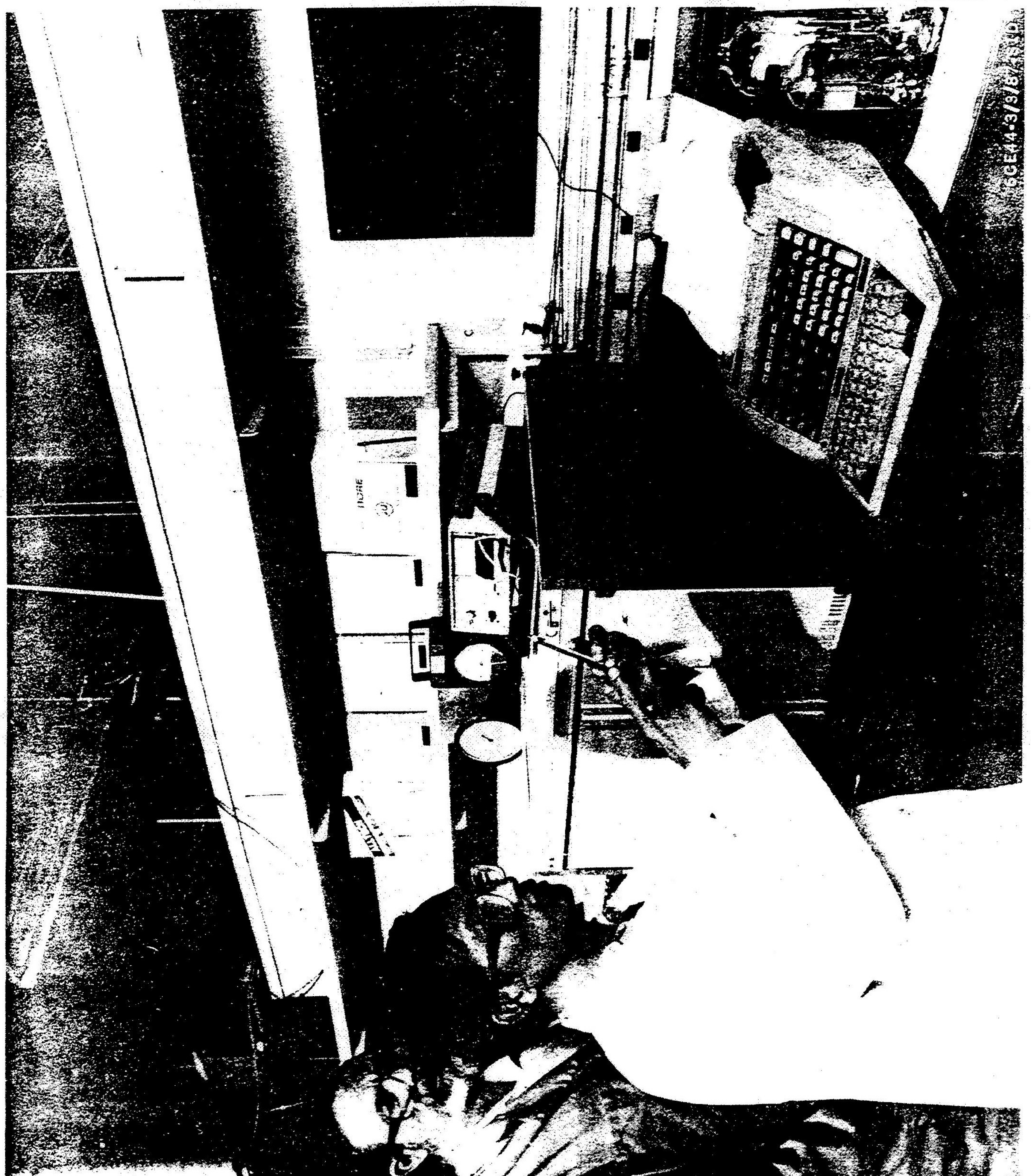
Complete Chemical

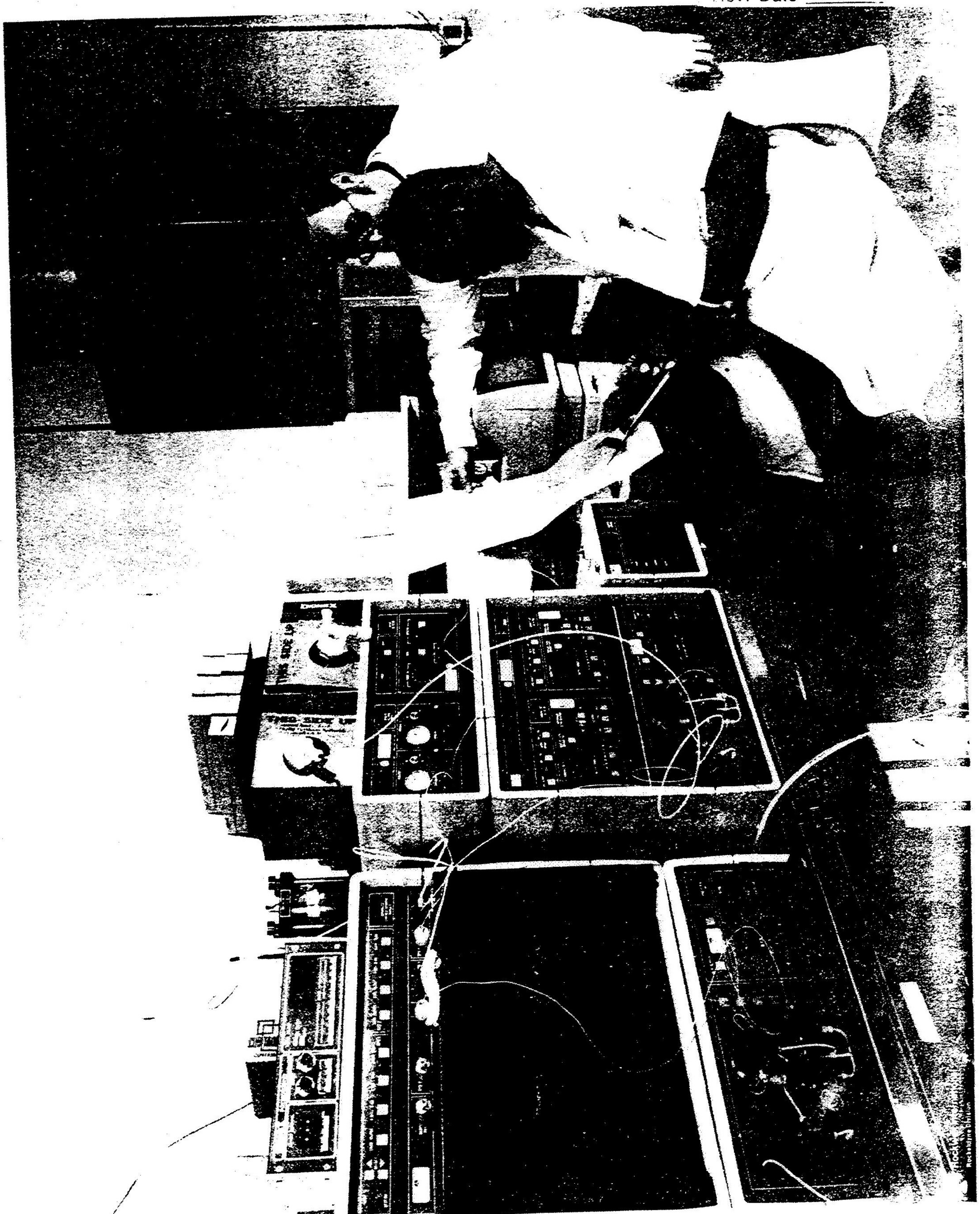
First Issued at Berkeley, May 12, 1976

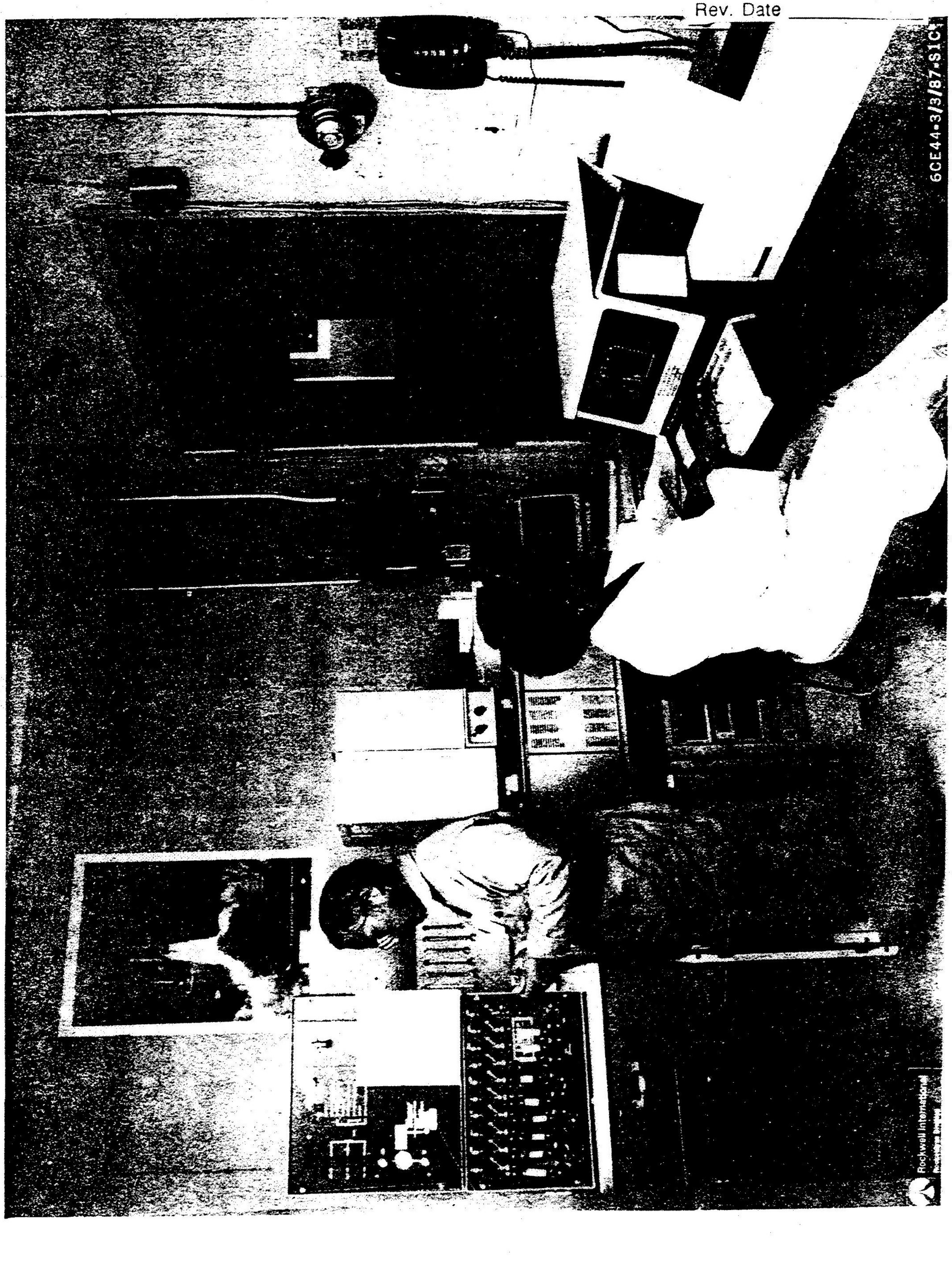
By B. R. Tamplin
Chief, Sanitation and Radiation Laboratory

This approval is subject to revocation or suspension for good cause

FORM 245-302A (REV. 1-1-71)
48441-480 12-70 3M DUP OSP






6CE44-3/3/87-S1C
Rockwell International


6CE44•3/3/87•S1B
Rockwell International
Rocketdyne Division

Appendix C

Pathways Calculations

The amount of underground water at SSFL is limited and controlled by fractures in the Cretaceous Chatsworth Formation sandstone which underlies the property. There is very little replenishment to the groundwater from rainfall and runoff, and the underground water can be depleted. The Chatsworth Formation as a whole is a very poor aquifer or water producing formation. Most of the formation shows evidence of secondary cementation which has decreased the original porosity to a very low capacity. The majority of the porosity in which water occurs in the formation is very closely associated with fault planes, fractures, and joints throughout the entire thickness of the sediment.

The capacity of each well at SSFL to produce is controlled by the number and association of the fractures and joints in the formation generally associated with faults. There is no known method to determine the fracture system capacity and extent underneath the SSFL except by interpretation of empirical data from the history of the operations. RD-7 has been determined to be a low producing well.

The capacity of the wells to produce show a wide variation even though they have penetrated practically the same strata. This fact indicates that the whole system of fractures is not closely interconnected. Review of the attached drawings (1) Volatile Organic Constituents Shallow Zone and (2) Volatile Organic Constituents Chatsworth Formation Wells shows that while TCE is detected in WS-4 and RD-4 as a result of prior rocket engine tests by NASA, the intercepting wells WS-11, WS-8, and WS-7 have none detected. This would confirm that TCE has not moved from SSFL Area II to SSFL Area IV but is in place in localized fracture zones.

Shallow alluvium (generally about 20 ft) groundwater flow is not considered to be a problem based on prismatic acre feet relationships where

$$\text{Landfill} = (\text{Source/Zone of Concern}) = (2.5 \times 10^7\ \text{ft}^2)/(10^4\ \text{ft}^2) = 2.5 \times 10^3 \text{ dilution factor}$$

$$\text{Burn Pit} = (\text{Source/Zone of Concern}) = (2.5 \times 10^7\ \text{ft}^2)/(5 \times 10^4\ \text{ft}^2) = 0.5 \times 10^3 \text{ dilution factor}$$

Based on extractables averaged for the area of concern

$$\text{Landfill} = (\text{Possible Contaminants/Dilution Factor}) = (25 \times 10^{-9})/(2.5 \times 10^3) = 10 \times 10^{-12} \text{ (TCE equivalent)}$$

$$\text{Burn Pit} = (\text{Possible Contaminants/Dilution Factor}) = (25 \times 10^{-9})/(0.5 \times 10^3) = 50 \times 10^{-12} \text{ (TCE equivalent)}$$

Further dilution as a result of inundation to the Simi Floor would result in an additional 10^{-12} dilution.

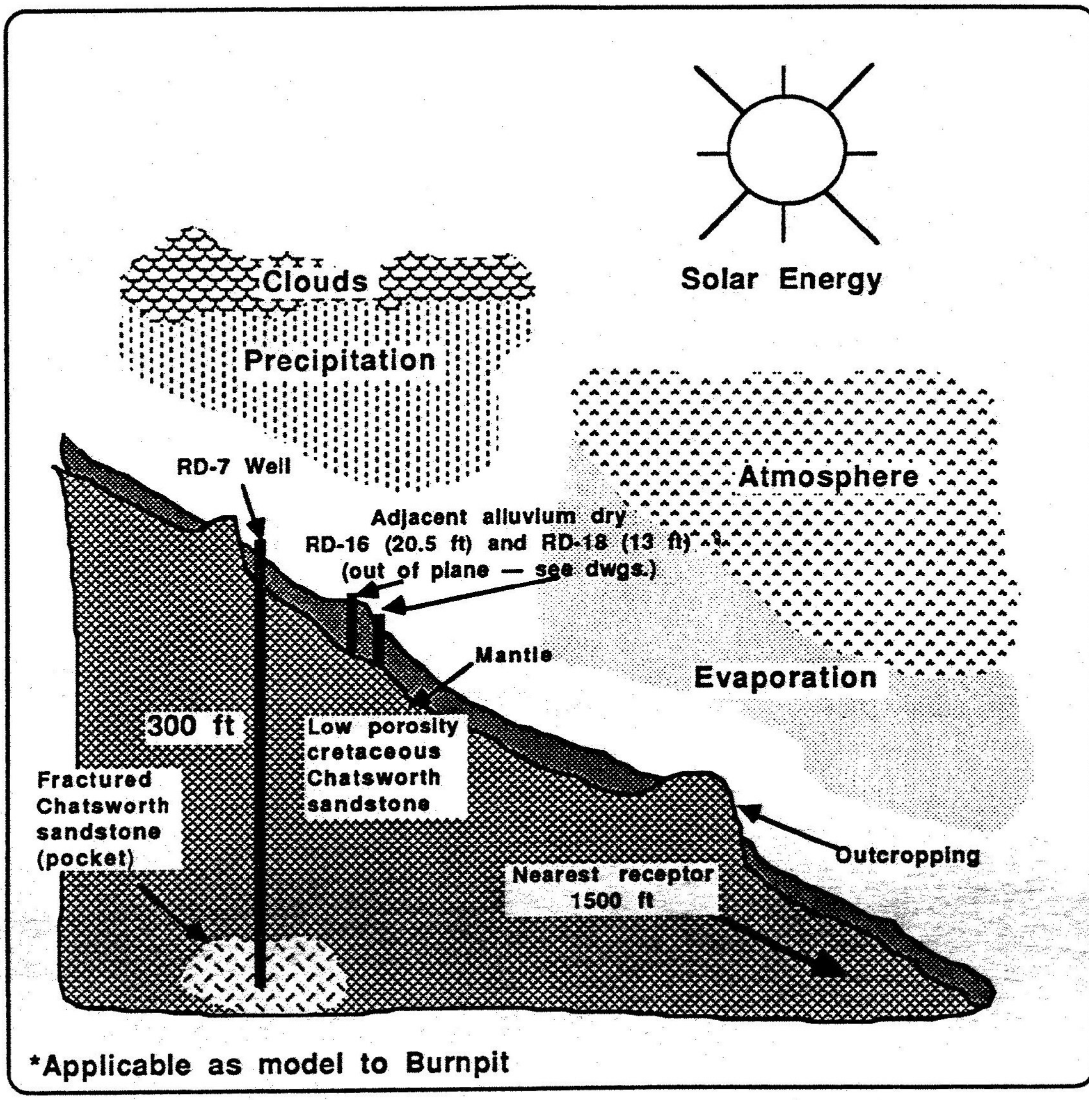


Figure C.1. Landfill Model

Table C1. Selected Well Data

Well Designation	Ground Elevation (ft)	Depth Drilled (ft)	Remarks
RD-7	1805	300	273 pump S.L. 58 ft
RS-16	1805	20.5	SS @ 18 ft
RS-18	1805	13.0	SS @ 9 ft; S.L. 2.6 ft
		Notes: Silt 0-8 ft Sandstone (SS) 8-300 Fractures 120-250	
WS-7	1828	700	1524 above sea level
WS-8	1796	700	1485 above sea level
WS-11	1756	700	1626 above sea level

Given the extremely low water solubilities and corresponding high partition coefficients for many of the PCB isomers, especially the highly chlorinated one, their mobility in soils is anticipated to be very slight, especially when considering soils containing relatively large amounts of clays and organic matter. Griffen and Chian (1979) have studied the attenuation of selected PCB's in several soil systems and determined adsorption coefficients and R values. The soil systems studied were medium temperature coal char (MTC), high temperature coal char (HTC), Catlin Soil (CS), Montmorillonite Clay (MC), and Ottawa Silica Sand (OS).

Adsorption studies with Arochlor 1242, both in the pure state and as a used capacitor fluid, revealed a linear Freundlich isotherm. In all cases, low temperature ashing reduced the adsorption coefficient, confirming the contribution of organic content to adsorption. This is supported by the observation that the adsorption decreased with increasing ashing times. No significant differences were found in the behavior of Arochlor 1242 in the pure state or as a used capacitor fluid.

The relationship between the adsorption extent and the soil organic content has been evaluated using soil TOC. It was found that

$$K = 255 + 18.5\ TOC$$

with a correlation coefficient, r^2, of 0.87 using a linear regression at the 0.001 level of significance. The adsorption coefficient was also correlated to the surface area, SA, at the 0.001 level of significance, as follows

$$K = 230 + 6.64\ SA\ (r^2 = 0.82)$$

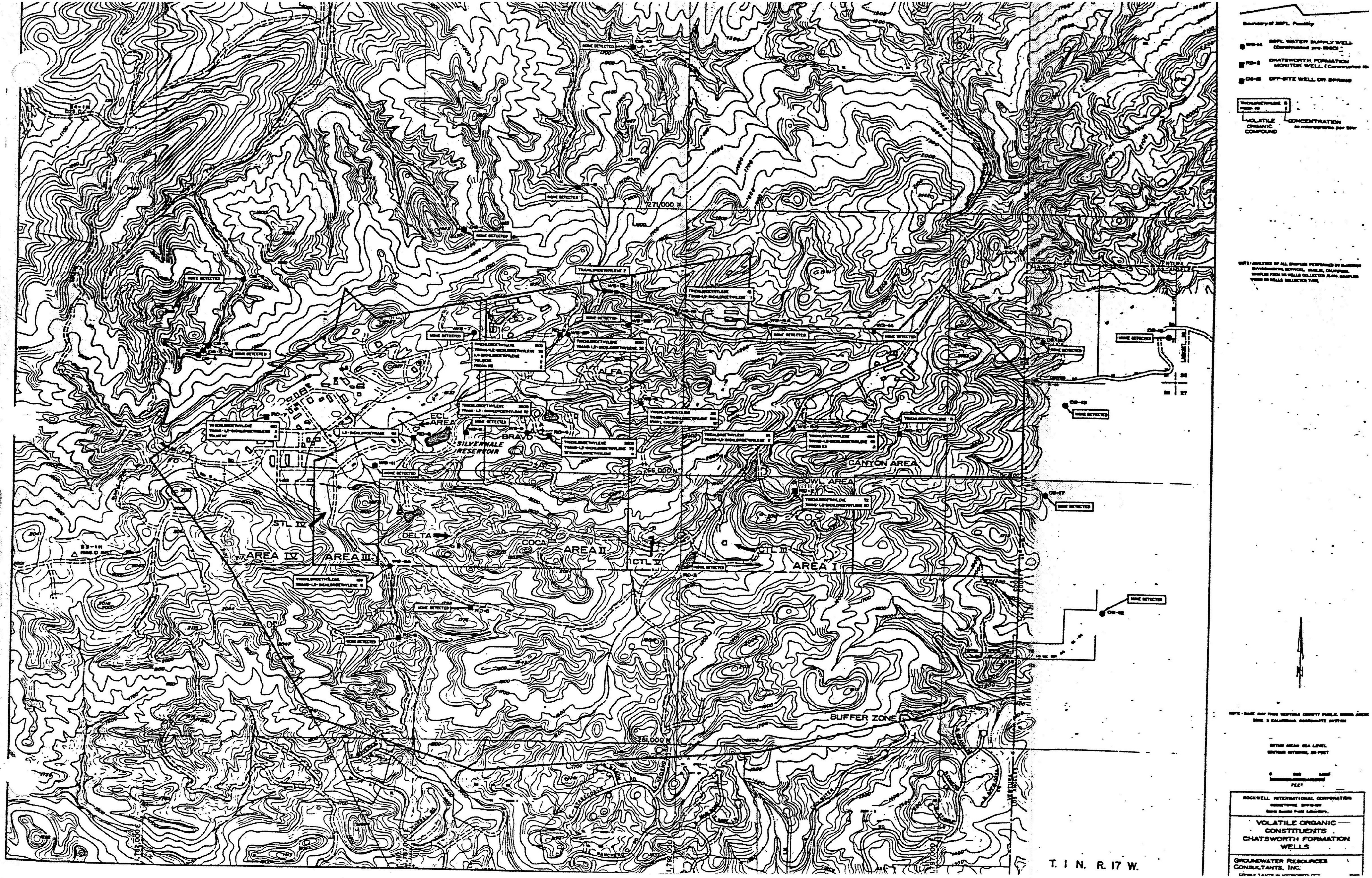
where SA is the CO_2 - surface area. Finally, a three variable regression was reported at the 0.001 level of significance as follows

$$K = 188 + 3.36\ SA + 11.4\ TOC\ (r^2 = 0.95)$$

where SA is CO_2 - surface area.

TOC studies were reported using Dicamba as a standard with a variety of solvents and soil systems. Retardation factors have been exhibited for several soils using distilled deionized water, Du Page Leachate, and carbon tetra - chloride. Du Page leachate was collected from the Du Page County, Illinois, sanitary landfill. These studies confirmed the significance of soil organic content, surface area, and leachate composition in the attenuation of PCB's.

Also a significant difference in the mobility of Arochlor 1254 compared to Arochlor 1242 was observed, confirming the expectation that the retention of the various Arochlors by soil increases with increasing chlorine content.



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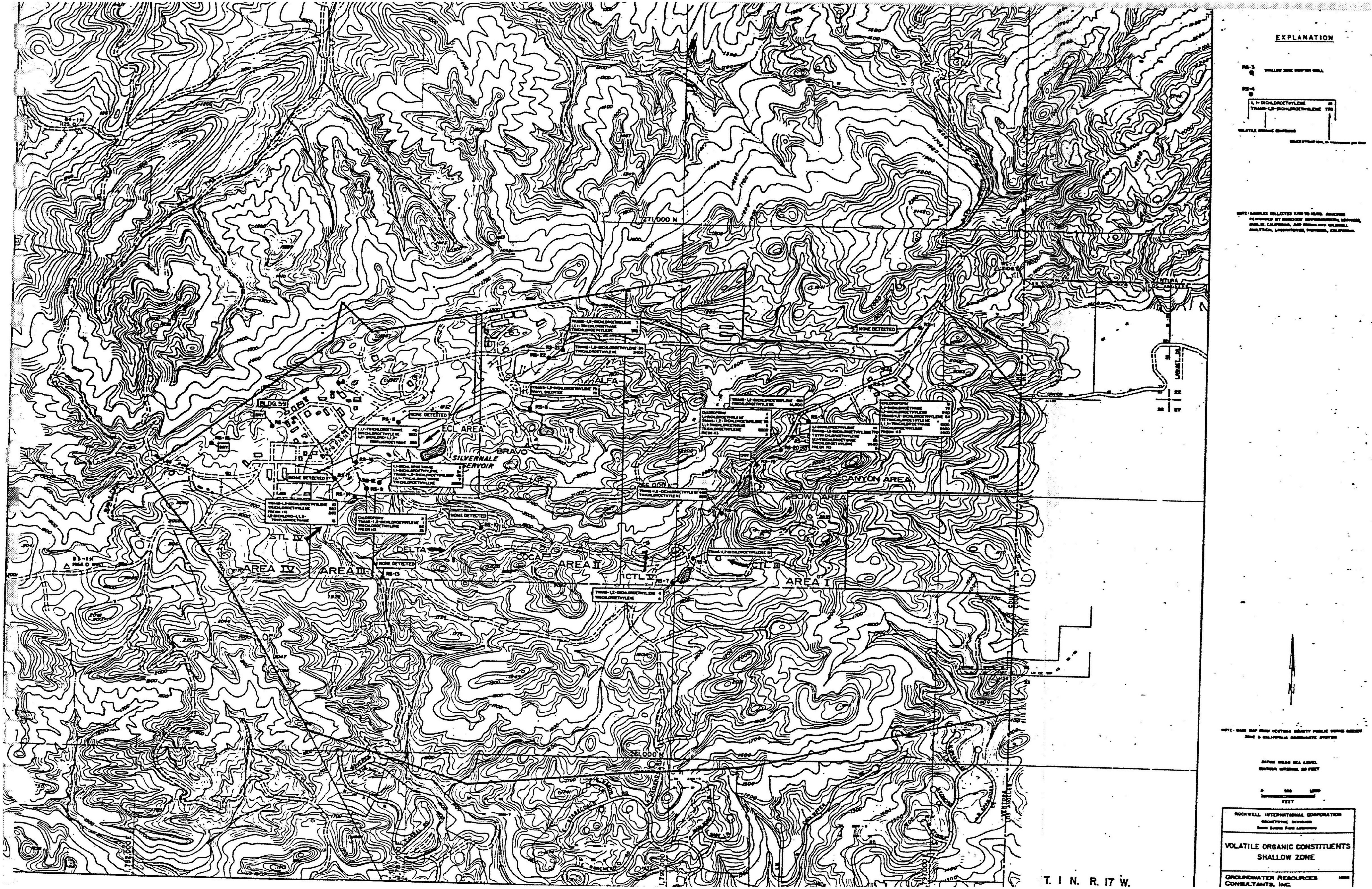
EXPLANATION
RS-3
RS-4
BLDG 59
ECL AREA
SILVERNALE RESERVOIR
BRAVO
ALFA
CANYON AREA
BOWL AREA
STL IV
DELTA
COCA
AREA IV
AREA III
AREA II
AREA I
CTL III
NONE DETECTED
271,000 N
261,000 N
T. 1 N. R. 17 W.
DATUM MEAN SEA LEVEL
CONTOUR INTERVAL 20 FEET
FEET
ROCKWELL INTERNATIONAL CORPORATION
VOLATILE ORGANIC CONSTITUENTS
SHALLOW ZONE
GROUNDWATER RESOURCES
CONSULTANTS, INC.