COMPLIANCE CERTIFICATION — SECTION O

1. Emission Point No./Name EPA003 Switch tie Unloader Cyclone

2. Indicate the source compliance status:

A. __X__ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. _____ The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:

Starting date: ____ and every six (6) months thereafter

Problem	Action	Deadline

COMPLIANCE CERTIFICATION — SECTION O

1. Emission Point No./Name EPA004 Cross tie Unloader Cyclone

2. Indicate the source compliance status:

A. __X__ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. _____ The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:

Starting date: __NA__ and every six (6) months thereafter

Problem	Action	Deadline

COMPLIANCE CERTIFICATION — SECTION O

1. Emission Point No./Name (Retort/VacySys) EPA005 & EPA005A (Boilers); EP002-004 Cyclones; EP001

2. Indicate the source compliance status:

   A. __X__ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

   B. _____ The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

   C. _____ This source is not in compliance. The following statement of corrective action is submitted to describe action which we will take to achieve compliance.

      1. _____ Attached is a brief description of the problem and the proposed solution.

      2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:

Starting date: _____ and every six (6) months thereafter

Problem	Action	Deadline
NA		

COMPLIANCE CERTIFICATION — SECTION O

1. Emission Point No./Name EPA017 WWT Scrubber

2. Indicate the source compliance status:

A. __X__ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. _____ The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:

Starting date: _____ and every six (6) months thereafter

Problem	Action	Deadline
NA		

APPENDIX

ADDITIONAL INFORMATION

Table 1

Emission Estimates For Boilers
Natural Gas
Kerr-McGee Chemical LLC
Columbus, MS
Revised October 22, 2001

Hurst Series 400, 350 HP Boiler-Natural Gas
Application: June 2001
Emission Point AA-028

Regulated Air Pollutants	Emission Factor* (lb/MMft3)	Fuel Value (BTU/ft3)	Firing Rate (MMBTU/hr)	Hourly Emission (lb/hr)	Hours Per Year (hours/yr)	Conversion Factor (lb/ton)	Annual Emissions (Ton/year)	Hurst Boiler PTE (Ton/year)
Particulate	1.9	1000	14.7	0.03	8760	2000	0.12	0.12
PM-10	1.9	1000	14.7	0.03	8760	2000	0.12	0.12
SO_2	0.6	1000	14.7	0.01	8760	2000	0.04	0.04
NOx	100	1000	14.7	1.47	8760	2000	6.44	6.44
CO	84	1000	14.7	1.23	8760	2000	5.41	5.41
VOC's	5.5	1000	14.7	0.08	8760	2000	0.35	0.35
PAC (lb/MMBTU)	3.15E-05	1000	14.7	0.00	8760	2000	0.00	0.00

Hurst Series 400, 350 HP Boiler-Natural Gas has the maximum capacity of 129 $MMft^3$/year

Cleaver Brooks Model CB D-6
Existing Boiler
Emission Point AA-001

Regulated Air Pollutants	Emission Factor* (lb/MMft3)	Fuel Value (BTU/ft3)	Firing Rate (MMBTU/hr)	Hourly Emission (lb/hr)	Limit[2] Nat Gas 150 $MMft^3$/yr	Conversion Factor (lb/ton)	Annual Emissions (Ton/year)	CB-D-6 Boiler PTE (Ton/year)
Particulate	1.9	1000	34	0.06	150	2000	0.14	0.14
PM-10	1.9	1000	34	0.06	150	2000	0.14	0.14
SO_2	0.6	1000	34	0.02	150	2000	0.05	0.05
NOx	100	1000	34	**3.40**	150	2000	7.50	**7.50**
CO	84	1000	34	**2.86**	150	2000	6.30	**6.30**
VOC's	5.5	1000	34	**0.19**	150	2000	0.41	**0.41**
PAC (lb/MMBTU)	3.15E-05	1000	34	0.00	150	2000	0.00	0.00

Maximum Emission From Oil or Gas

* All Emission Factors are based on AP-42 Factors: Table 1.4-1/2, 7/98
PAC (lb/MMBTU) Emission Factor From EPA Seminar

Limit[2] Seeking an operating limit of maximium annual gas usage of 150 $MMft^3$/year

Clever Brooks Boiler-Natural Gas has the maximum capacity of 298 $MMft^3$/year

Seeking an operating limit where only one boiler is operating at a time except during startup or shutdown

Table 2

Emission Estimates For Boilers
Number 2 Fuel Oil
Kerr-McGee Chemical LLC
Columbus, MS
Revised October 22, 2001

Hurst Series 400, 350 HP Boiler-No. 2 Fuel Oil (With Fuel Oil Limitation) Application: November 2001 Emission Point AA-028								
Regulated Air Pollutants	Emission Factor* (lb)/1000gal	Conversion Factor (per 1000gal)	Fuel Value (Gal/hr)	Hourly Emission (lb/hr)	Limit[1] 216,000 (Hours/yr)	Conversion Factor (lb/ton)	Annual Emissions (Ton/year)	Hurst PTE (Ton/year)
Particulate	2	0.001	105	**0.21**	2057	2000	0.22	**0.22**
PM-10	2	0.001	105	**0.21**	2057	2000	0.22	**0.22**
SOx (.5% Sulfur)	71	0.001	105	**7.46**	2057	2000	7.67	**7.67**
NOx (.03%Nitrogen)	20	0.001	105	2.10	2057	2000	2.16	2.16
CO	5	0.001	105	0.53	2057	2000	0.54	0.54
VOC's	0.2	0.001	105	0.02	2057	2000	0.02	0.02
PAC lb/MMBTU	2.51E-08			0.000			0.00	0.00

Cleaver Brooks Model CB D-6 Existing Boiler (Has Fuel Oil Limitation) Emission Point AA-001								
Regulated Air Pollutants	Emission Factor* (lb)	Conversion Factor (per 1000gal)	Fuel Value (Gal/hr)	Hourly Emission (lb/hr)	Limit[1] 216,000 (Hours/yr)	Conversion Factor (lb/ton)	Annual Emissions (Ton/year)	CB D-6 PTE (Ton/year)
Particulate	2	0.001	100	0.20	2160	2000	0.22	0.22
PM-10	2	0.001	100	0.20	2160	2000	0.22	0.22
SOx (.5% Sulfur)	71	0.001	100	7.1	2160	2000	7.67	7.67
NOx (.03%Nitrogen)	20	0.001	100	2.00	2160	2000	2.16	2.16
CO	5	0.001	100	0.50	2160	2000	0.54	0.54
VOC's	0.2	0.001	100	0.02	2160	2000	0.02	0.02
PAC lb/MMBTU	2.51E-08			0.000			0.00	0.00

Maximum Emissions

* All Emission Factors are based on AP-42 Factors: Table 1.3-1, Distillate oil fired

Limit[1] **Operating Permit Limits annual fuel oil usage to 216,000 gallons in any 12 consecutive months Permit 1680-0002**

Seeking an operating limit where only one boiler is operating at a time except during startup or shutdown

Table 3

Emission Estimates For Boilers
Potential To Emit Summary (Permit Limit)

Kerr-McGee Chemical LLC
Columbus, MS
Revised October 22, 2001

Regulated Air Pollutants	Short Term Permit Limit (lb/hr)						
	See Table_	Boiler Fuel	Boiler Fuel	Hurst Boiler	CB D-6 Boiler	Single Boiler Maximum	Short Term Allowable lb/hr
Particulate	Table 2	No. 2 Fuel Oil	No. 2 Fuel Oil	0.21	0.20	0.21	**0.21**
PM-10	Table 2	No. 2 Fuel Oil	No. 2 Fuel Oil	0.21	0.20	0.21	**0.21**
SOx	Table 2	No. 2 Fuel Oil	No. 2 Fuel Oil	7.46	7.10	7.46	**7.46**
NOx	Table 1	Natural Gas	Natural Gas	1.47	3.40	3.40	**3.40**
CO	Table 1	Natural Gas	Natural Gas	1.23	2.86	2.86	**2.86**
VOC's	Table 1	Natural Gas	Natural Gas	0.08	0.19	0.19	**0.19**

PAC is NA

Allowable
Based on the greatest emission level using either natural gas or No. 2 fuel oil for a single boiler

Regulated Air Pollutants	Long Term Permit Limit (TPY)						
	See Table_	Boiler Fuel	Hurst Boiler	CB D-6 12 Mon. Gas	CB D-6 3 Mons. Oil	CB D-6 9 Mons. Gas	Long Term Allowable TPY*
Particulate	Table 2	No. 2 Fuel Oil	0.22	0.14	0.22	0.11	**0.32**
PM-10	Table 2	No. 2 Fuel Oil	0.22	0.14	0.22	0.11	**0.32**
SOx	Table 2	No. 2 Fuel Oil	7.67	0.05	7.67	0.03	**7.70**
NOx	Table 1	Natural Gas	6.44	7.50			**7.50**
CO	Table 1	Natural Gas	5.41	6.30			**6.30**
VOC's	Table 1	Natural Gas	0.35	0.41			**0.41**

Permit Value PAC is NA

All Emission Factors are based on AP-42 Factors

Allowable TPY* **Operating Permit Limits annual fuel oil usage to 216,000 gallons and/or 150 MMft^3/year Natual Gas in any 12 consecutive months for either boilers combined.**

Based on higher of 12 months natural gas usage or 3 months oil/9months natural gas usage.

Seeking an operating limit where only one boiler is operating at a time except during startup or shutdown

Table 4

2000 Columbus Title V-100% Green Treatment (913 Charges/yr; 90 Green Charges/Month)

Revised 10/30/01

	Point Source (Controlled) Emissions (pounds per year) Green Permit Limit					
I. Point Sources	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	VOC	PAC
Work Tanks	1.9	0.2	0.2	0.2	4.3	0
Storage Tanks	0	0	0	0	0	0
Boulton Conditioning	76	9	4	3	175	0
Wood Treatment	47	5	2	2	108	0
Flash	0	0	0	0	0	0
Dehydrator	9	1	0	0	21	0
Wastewater Treatment	29	3	1	1	67	0
Point Source Total (lb)	163	19	8	7	375	1
Point Source Total (TPY)	0.08	0.01	0.00	0.00	0.19	0.00
Point Source Total (Lb/hr)	0.03	0.00	0.00	0.00	0.06	0.00

	Fugative Emissions (pounds per year) Green Permit Limit					
II. Fugitives	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	VOC	PAC
Ancillary Equipment	706	80	33	29	1621	2
Retort Door	208	24	10	9	477	0
Sumps	90	10	4	4	207	0
AWPI Black Tie Storage Yard Model	9102	1042	430	378	21670	20
Black Pole Storage	0	0	0	0	0	
FugitiveTotal (lb)	10105	1156	477	419	23974	22
Fugitive Source Total (TPY)	5.05	0.58	0.24	0.21	11.99	0.01
Fugitive Source Total (lb/hr)	1.15	0.13	0.05	0.05	2.74	0.00

	Total Emissions - 913 Green Charges Per Year						
Summary	Naphthalene (lb/yr)	Dibenzofuran (lb/yr)	Quinoline (lb/yr)	Biphenyl (lb/yr)	VOC (lb/yr)	PAC (lb/yr)	Total HAP (lb/yr)
Total Point Sources	163	19	8	7	375	1	197
Total Fugative Sources	10105	1156	477	419	23974	22	12158
Total Plant Emissions (lb/yr)	10269	1175	485	426	24349	23	12355
Total Plant Emissions (TPY)	5.13	0.59	0.24	0.21	12.17	0.01	6.18
Title V Threshold	10	10	10	10	100	NA	25

Based on June 2001 AWPI Emissions Model. See Appendix B

Based 913 green charges per year (90 Maximium Green Charges/Month) See Table 6 and Table 7

Table 5
Wood Preserving Process PTE (Base on Process Limitation)
2000 Columbus Title V-100% Dry Treatment (2190 Charges/yr; 216 Dry Charges/Month)
Revised 10/30/01

	Controlled Emissions (pounds per year) Dry PTE					
I. Point Sources	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	VOC	PAC
Work Tanks	2	0	0	0	5	0
Storage Tanks	0	0	0	0	0	0
Boulton Conditioning	0	0	0	0	0	0
Wood Treatment	926	105	44	38	2127	203
Flash	0	0	0	0	0	0
Dehydrator	9	1	0	0	21	2
Wastewater Treatment	29	3	1	1	67	6
Point Source Total (lb)	**967**	**110**	**45**	**40**	**2220**	**211**
Point Source Total (TPY)	**0.48**	**0.06**	**0.02**	**0.02**	**1.11**	**0.11**
Point Source Total (Lb/hr)	**0.17**	**0.02**	**0.01**	**0.01**	**0.38**	**0.04**

	Controlled Emissions (pounds per year)					
II. Fugitives	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	VOC	PAC
Ancillary Equipment	706	80	33	29	1621	154
Retort Door	469	53	22	19	1078	103
Sumps	90	10	4	4	207	20
AWPI Black Tie Storage Yard Model	9102	1042	430	378	21670	2063
Black Pole Storage	0	0	0	0	0	0
FugitiveTotal (lb)	**10367**	**1186**	**489**	**430**	**24575**	**2340**
Fugitive Source Total (TPY)	**5.18**	**0.59**	**0.24**	**0.22**	**12.29**	**1.17**
Fugitive Source Total (lb/hr)	**1.8**	**0.2**	**0.1**	**0.1**	**4.2**	**0.4**

	Total Emissions - 2190 Dry Charges Per Year						
Summary	Naphthalene (lb/yr)	Dibenzofuran (lb/yr)	Quinoline (lb/yr)	Biphenyl (lb/yr)	VOC (lb/yr)	PAC (lb/yr)	Total HAP (lb/yr)
Total Point Source	967	110	45	40	2220	211	1162
FugitiveTotal (lb)	10367	1186	489	430	24575	2340	12473
Total Plant Emissions (lb/yr)	**11334**	**1296**	**535**	**470**	**26795**	**2551**	**13635**
Total Plant Emissions (TPY)	**5.67**	**0.65**	**0.27**	**0.24**	**13.40**	**1.28**	**6.82**
Title V Threshold (TPY)	10	10	10	10	100	NA	25

Based on June 2001 AWPI Emissions Model. See Appendix C.
Based on 2190 dry charges per year (216 Maximum Dry Charges/month) See Table 6 and Table 7

Table 6
Comparison Of Green And Dry Treatment
Tables 4 and 5
Columbus, MS Permit Renewal
October 30, 2001

Permit Limit *(italicized)*							
Dry Treatment Limit = 2190			Green Treatment Limit = 913			Dry + Green	
Number Dry Charges 12 Months	Total Emissions VOC (lb/yr)	VOC Emissions Charge (lb/charge)	Number Green Charges 12 Months	Total Emissions VOC (lb/yr)	VOC Emissions Charge (lb/charge)	Total Emissions VOC (lb/yr)	Number Total Charges 12 Months
Maximium Level						**Maximium Level**	
2190	26795	12.24	0	0	26.68	***26795***	2190
2000	24471	12.24	79	2112	26.68	26583	2079
1900	23247	12.24	121	3224	26.68	26471	2021
1800	22024	12.24	163	4336	26.68	26360	1963
1700	20800	12.24	204	5448	26.68	26248	1904
1600	19577	12.24	246	6560	26.68	26136	1846
1500	18353	12.24	288	7672	26.68	26025	1788
1400	17129	12.24	329	8783	26.68	25913	1729
1300	15906	12.24	371	9895	26.68	25801	1671
1200	14682	12.24	413	11007	26.68	25689	1613
1100	13459	12.24	454	12119	26.68	25578	1554
1000	12235	12.24	496	13231	26.68	25466	1496
900	11012	12.24	538	14342	26.68	25354	1438
800	9788	12.24	579	15454	26.68	25243	1379
700	8565	12.24	621	16566	26.68	25131	1321
600	7341	12.24	663	17678	26.68	25019	1263
500	6118	12.24	704	18790	26.68	24907	1204
400	4894	12.24	746	19902	26.68	24796	1146
300	3671	12.24	788	21013	26.68	24684	1088
200	2447	12.24	829	22125	26.68	24572	1029
100	1224	12.24	871	23237	26.68	24461	971
0	0	12.24	912.5	24349	26.68	24349	913
			Minimum Level			**Minimum Level**	

See Table 4 and Table 5

Based on 2190 dry charges per year (216 Maximum Dry Charges/month) or 913 green charges per year (90 Maximium Green Charges/Month)

Table 7
Synthetic Minor Renewal Application
Revised 10/30/01
Production Limits

Production Limits					
1995 PTE					
Cuft/Charge	Charge/Day	Cuft/yr	Cuft/day	T.E./Chg	Process
2364	9	7,765,740	21,276	650	Dry
2364	3	2,588,580	7,092	650	Green

Creosote Used					
1995 PTE					
Cuft/day	Lbs.Creo/Ft3	Lbs. Creo/Gal	Gal/Day	Gal/yr	Process
21,276	7	9.1	16,366	5,973,646	Dry
7,092	7	9.1	5,455	1,991,215	Green

Summary					
1995 PTE					
Cuft/yr	Cuft/Charge	Chg/yr	T.E./yr	T.E./day	Process
7,765,740	2364	3285	2,133,445	5,845	Dry
2,588,580	2364	1095	711,148	1,948	Green

T.E. = Tie Equalvants

Production Limits							
2001 Modification							
Cuft/Charge	Ave. Chg/Day	Max. Chg/Mo.	Max. Chg/yr	Cuft/yr	Ave Cuft/day	T.E./Chg	Process
2364	6	216	2190	5,177,160	14,184	650	Dry
2364	2.5	90	913	2,157,150	5,910	650	Green

PTE

Creosote Used							
2001 Modification							
Cuft/day	Lbs.Creo/Ft3	Max. Chg/Mo.	Max. Chg/yr	Lbs. Creo/Gal	Ave Gal/Day	Gal/yr	Process
14,184	7	216	2190	9.1	10,911	3,982,431	Dry
5,910	7	90	913	9.1	4,546	1,659,346	Green

Summary							
2001 Modification							
Cuft/yr	Ave. Chg/Day	Max. Chg/Mo.	Max. Chg/yr	Ave. T.E./day	Max. T.E./Mon.	Max. T.E./yr	Process
5,177,160	6	216	2190	14,184	140,400	1,423,500	Dry
2,157,150	2.5	90	913	5,910	58,500	593,125	Green

Based on 2190 dry charges per year (216 Maximum Dry Charges/month) or 913 green charges per year (90 Maximum Green Charges/Month)

Table 8
Synthetic Minor Renewal Application
Revised October 30, 2001
PTE - Emission Summary - Columbus, MS

Pollutant	Maximum Emission Rate (PTE To Emission Summary Section C)																						Data Source
	Particulate		PM10		SOx		NOx		CO		VOC		Naphthalen		Dibenzofuran		Quninoline		Biphenyl		PAC		
	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	Short (lb/hr)	Long TPY	
Particulate - Boilers (Fuel Oil)	0.21	0.32																					Table 3*
PM-10 -Boilers(Fuel Oil)			0.21	0.32																			Table 3
Particulate - Framing Mill (Title V App.)**	0.73	3.20																					1995 Title V
PM-10 - Framing Mill (Title V App.)**			0.37	1.62																			1995 Title V
Particulate - Switch Tie Unloader (Title V App.)**	0.21	0.93																					1995 Title V
PM-10 - Switch Tie Unloader (Title V App.)**			0.11	0.47																			1995 Title V
Particulate -Cross Tie Unloader (Title V App.)**	0.38	1.67																					1995 Title V
PM-10 - Cross Tie Unloader (Title V App.)**			0.19	0.84																			1995 Title V
SOx Boilers (Fuel Oil)					7.46	7.70																	Table 3*
NOx - Boilers (Natural Gas)							3.40	7.50															Table 3*
CO - Boilers (Natural Gas)									2.86	6.30													Table 3*
VOC's - Boilers (Natural Gas)											0.19	0.41											Table 3*
Wood Preserving VOC											4.59	13.40											Table 5**
Wood Preserving Naphthalene (43.6% VOC)													2.00	5.67									Table 5**
Wood Preserving Dibenzofuran (4.96% VOC)															0.23	0.65							Table 5**
Wood Preserving Quinoline (2.05% VOC)																	0.09	0.27					Table 5**
Wood Preserving Biphenyl (1.80% VOC)																			0.08	0.24			Table 5**
Wood Preserving Process PAC (9.52% VOC)																					0.44	1.28	Table 5**
Total Maximum	**1.53**	**6.12**	**0.88**	**3.25**	**7.46**	**7.70**	**3.40**	**7.50**	**2.86**	**6.30**	**4.78**	**13.81**	**2.00**	**5.67**	**0.23**	**0.65**	**0.09**	**0.27**	**0.08**	**0.24**	**0.44**	**1.28**	

Table 3* Based on Tables 1 & 2

Table 5** 2190 Dry Treatment charges (Table 5) has higher emissions than 913 Green Treatment charges(Table 4).

Production (Table 7) Based on 2190 dry charges per year (216 Maximum Dry Charges/month) or 913 green charges per year (90 Maximium Green Charges/Month)

Table 9

Revised October 30, 2001

Comparison of Emissions Inventory, Permit Application and Current Permit

Emission	Emission Point	Emission Unit	9/13/01 MDEQ-EI DEQ-EI		Permit Renewal Nov-01 Table 3/Table 8		Difference (Charge) TPY	Potential Reasons For Differences
			TPY	PPH	TPY	PPH		
PM	CB Boiler	AA-001	0.88	0.20	0		-0.88	Only single boiler operating at one time
								See Table 3
PM	Vogt Boiler	AA-002	0.16	0.038	0	0	-0.16	Vogt Boiler Demolished
PM	Framing Mill	AA-003	3.20	0.73	3.20	0.73	0.00	
PM	SW Unloader	AA-008	0.93	0.213	0.93	0.21	0.00	
PM	Tie Unloader	AA-009	1.67	0.381	1.67	0.38	0.00	
PM	Fuel Storage	AA-020	0.85	0.195	0	0	-0.85	Insignificant emission source
PM	Hurst Boiler	AA-028	0.92	0.21	0.32	0.21	-0.60	
PM	Total		8.61		6.12		-2.5	PM Decrased 2.6 TPY (Single Boiler)
PM-10	CB Boiler	AA-001	0.88	0.2	0		-0.88	Only single boiler operating at one time
								See Table 3
PM-10	Vogt Boiler	AA-002	0.16	0.036	0	0	-0.16	Vogt Boiler Demolished
PM-10	Framing Mill	AA-003	1.62	0.038	1.62	0.038	0.00	
PM-10	SW Unloader	AA-008	0.47	0.107	0.47	0.107	0.00	
PM-10	Tie Unloader	AA-009	0.84	0.192	0.84	0.192	0.00	
PM-10	Fuel Storage	AA-020	0.85	0.195	0	0	-0.85	Insignificant emission source
PM-10	Hurst Boiler	AA-028	0.92	0.21	0.32	0.21	-0.60	
PM-10	Total		5.74		3.25		-2.5	PM-10 Decrased 2.6 TPY (Single Boiler)
SO2	Boiler							See Table 3
	(2 Boilers)		71.78		7.70		-64	Only single boiler operating at one time
								SO2 Decrease 64 TPY (F.O. Limit/One Boiler)
NOx	Boiler		38.63		7.50		-31	Only single boiler operating at one time
	(2 Boilers)							Limit Natural Gas to 150 MMft^3/year
								See Table 3
								NOx Decrease 31 TPY (Nat Gas Limit/One Boiler)
CO	Boiler		22.24		6.30		-16	Only single boiler operating at one time
	(2 Boilers)							Limit Natural Gas to 150 MMft^3/year
								See Table 3
								CO Decreased 16 TPY (Nat Gas Limit/One Boiler)
VOC	Boiler	AA-001	0.83		0.41	0.19	-0.4175	Only single boiler operating at one time
	Boiler	AA-028	0.35		0	0	0	AA-001 has greater PTE
			0.18					Limit Natural Gas to 150 MMft^3/year
	Storage Tank	A004	0.11				-0.11	
	Storage Tank	A005	0.11				-0.11	
	Storage Tank	A006	0.11				-0.11	
	Storage Tank	A007	0.04				-0.04	
	Fuel Oil Storage	A020	0.14				-0.14	Insignificant emission source: See Appendix D
	Point Sources		0		1.11	0.38	1.11	Includes AA-004-007; A-010-013; A0015-019; A-027
	Fugitive Sources		0		12.29	4.2	12.29	Includes A-010; A-014; Black Tie Storage; A-020-023
		Total	1.87		13.81		11.9	VOC Increase (Included Fugitives)

Table 10, Black Tie Storage Yard

KMCLLC Columbus

Title V Renewal June 2001
October 30, 2001
ESTIMATED EMISSIONS FROM A BLACK TIE STORAGE YARD
30-Oct-01

1. FACILITY IDENTIFICATION

FACILITY NAME	KMCLLC Columbus	
FACILITY LOCATION	Title V Mod June 2001	
NUMBER OF TIES EQUIVALENTS[1] TREATED PER MONTH	83,955	
% TIES SHIPPED WITHIN 24 HOURS	10	(0 to 100 %)

2. SELECT STORAGE GEOMETRY

RECTANGULAR		Mark with X if applicable
TRAM BUNDLE	x	Mark with X if applicable

3. INDIVIDUAL BLACK TIE GEOMETRY

LENGTH	8.5	feet
WIDTH	9	inches
HEIGHT	7	inches
VOLUME	3.71875	cubic feet

4. RECTANGULAR STACKING GEOMETRY

BLACK TIES PER STACK		ties per yard stack
STACK HEIGHT		ties tall
STACK HEIGHT		feet tall
STACK WIDTH		ties wide
STACK WIDTH		feet wide
STACK SURFACE AREA		square feet

5. TRAM BUNDLE STACKING GEOMETRY

NO. OF TIES IN A TRAM BUNDLE	60	ties per tram bundle
EQUIVALENT DIAMETER OF BUNDLE	5.78	feet
SURFACE AREA OF A 6-TIE TRAM BUNDLE	206.88	square feet

6. WEATHER DATA

MONTH	AVERAGE MONTHLY TEMPERATURE (°F)	
JANUARY	41.2	From Title V Application
FEBRUARY	44.9	From Title V Application
MARCH	52.6	From Title V Application
APRIL	62.6	From Title V Application
MAY	70.4	From Title V Application
JUNE	77.7	From Title V Application
JULY	80.9	From Title V Application
AUGUST	80.1	From Title V Application
SEPTEMBER	74.1	From Title V Application
OCTOBER	62.3	From Title V Application
NOVEMBER	51.1	From Title V Application
DECEMBER	44.1	From Title V Application

7. NUMBER OF BLACK TIES ON-SITE

MONTH	NUMBER OF TIES ON-SITE	Plant Estimate
JANUARY	350,000	350,000
FEBRUARY	250,000	250,000
MARCH	200,000	200,000
APRIL	200,000	200,000
MAY	200,000	200,000
JUNE	200,000	200,000
JULY	250,000	250,000
AUGUST	250,000	250,000
SEPTEMBER	250,000	250,000
OCTOBER	250,000	250,000
NOVEMBER	300,000	300,000
DECEMBER	350,000	350,000

Table 10, Black Tie Storage Yard

KMCLLC Columbus

Title V Renewal June 2001
October 30, 2001
[1]NOTE: FOR BLACK TIE EQUIVALENTS, ENTER EQUIVALENT NUMBER OF TIES THAT HAVE THE SAME VOLUME (3.72 CUBIC FEET)

Table 10, Black Tie Storage Yard

KMCLLC Columbus

Title V Renewal June 2001
October 30, 2001
RESULTS FOR BLACK TIE EMISSIONS

Annual Production			
1.0074605	million ties per year		
3.746493734	million cubic feet per year		
Maximum Black Ties on Site		350,000	
Minimum Black Ties on Site		200,000	
	Annual Naphthalene Emissions:		**Rounded**
4.529	tons per year 43.55% Naph	9058	**9100**
	Annual VOC Emissions:		
10.447	tons per year	20894	**21000**
	HAPs		
4.529	tons per year naphthalene 43.55% Naph	9058	**9100**
0.518	tons per year dibenzofuran 4.96 % Dibenzo	1036	**1040**
0.214	tons per year quinoline 2.05 % Quinoline	428	**430**
0.188	tons per year biphenyl 1.8% biphenyl	376	**380**
5.449	tons per year total HAPs	10898	**10900**

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

FACILITY AND PROCESS DATA

			Suggested Default Values
FACILITY ID OR NAME	Dry PTE		
FACILITY LOCATION	Columbus, MS		
DATE	21-Aug-02		
RETORT CYLINDER LENGTH	100	feet	From Plant Data Tab
RETORT CYLINDER DIAMETER	8	feet	From Plant Data Tab
WOOD VOLUME PER CHARGE	2,364	cubic feet	From Plant Data Tab
AIR DRY CHARGES	2,190	PTE	From Annual Report
STEAM CONDITIONED CHARGES[1]	100	PTE	From Annual Report
BOULTON CYCLE TREATMENT CHARGES	0		From Annual Report
PRESERVATIVE PURCHASES	3,982,431	gallons per year	From Annual Report
AMBIENT PRESSURE	14.57	psia	From Weather Tab
MEAN ANNUAL MAXIMUM AMBIENT TEMPERATURE	73	°F	From Weather Tab
MEAN ANNUAL MINIMUM AMBIENT TEMPERATURE	52	°F	From Weather Tab
DAILY TOTAL SOLAR INSOLATION FACTOR	1,345	Btu per square feet per day	Refer to AP-42 Table 7.1-7

I. POINT SOURCE AIR EMISSIONS

A. WORK TANK VENTS

NUMBER OF WORK TANKS	4		Title V Application
PVRVs USED:	X	Mark X if applicable	
EQUALIZATION LINES USED	X	Mark X if applicable	
AVERAGE TANK DIAMETER	19	feet	From Plant Data Tab
AVERAGE TANK SHELL HEIGHT	29	feet	From Plant Data Tab
AVERAGE LIQUID HEIGHT	26	feet	From Plant Data Tab
MAXIMUM LIQUID HEIGHT	29	feet	From Plant Data Tab
AVERAGE WORK TANK CAPACITY	62,250	gallons	From Plant Data Tab
ROOF TYPE (MARK WITH AN X)		Cone	
	X	Dome	Title V Application
		Flat	
CONE ROOF			
TANK CONE ROOF SLOPE	0	feet tall per feet radius	
DOME ROOF			
TANK DOME RADIUS	19	feet	Avg. tank diameter
VAPOR PRESSURE AVERAGE	0.038	psia	0.038
DAILY MINIMUM VAPOR PRESSURE	0.038	psia	0.038
DAILY MAXIMUM VAPOR PRESSURE	0.038	psia	0.038
BREATHER VENT PRESSURE SETTING	0.000	psig	0 for heated tanks
BREATHER VENT VACUUM SETTING	0.000	psig	0 for heated tanks
IF TANK IS HEATED (MARK WITH AN X)	X		
LIQUID BULK TEMPERATURE	180	°F	180
ROOF PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	
SHELL PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

B. STORAGE TANK VENTS

NUMBER OF STORAGE TANKS	0		Title V Application
PVRVs USED	0	Mark X if applicable	Title V Application
EQUALIZATION LINES USED	0	Mark X if applicable	Title V Application
AVERAGE TANK DIAMETER		feet	
AVERAGE TANK SHELL HEIGHT		feet	
AVERAGE LIQUID HEIGHT		feet	
MAXIMUM LIQUID HEIGHT		feet	
AVERAGE STORAGE TANK CAPACITY		gallons	
ROOF TYPE (MARK WITH AN X)		Cone	
		Dome	
		Flat	
CONE ROOF			
TANK CONE ROOF SLOPE		feet tall per feet radius	
DOME ROOF			
TANK DOME RADIUS		feet	Avg. tank diameter
VAPOR PRESSURE AVERAGE		psia	0.038
DAILY MINIMUM VAPOR PRESSURE		psia	0.038
DAILY MAXIMUM VAPOR PRESSURE		psia	0.038
BREATHER VENT PRESSURE SETTING		psig	0 for heated tanks
BREATHER VENT VACUUM SETTING		psig	0 for heated tanks
IF TANK IS HEATED (MARK WITH AN X)			
LIQUID BULK TEMPERATURE		°F	180
ROOF PAINT			
CONDITION (MARK WITH AN X)		Good	
		Poor	
COLOR (MARK WITH AN X)		Aluminum, shiny	
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	
SHELL PAINT			
CONDITION (MARK WITH AN X)		Good	
		Poor	
COLOR (MARK WITH AN X)		Aluminum, shiny	
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	

C. RETORT VACUUM SYSTEM EXHAUST VENTS

RETORT CHAMBER TEMPERATURE	190	°F
FULL CELL TREATMENT		
FULL CELL TREATMENT	0	charges per year
AIR DRY CONDITIONED	2190	charges per year
STEAM CONDITIONED	100	charges per year
BOULTON CYCLE CONDITIONED	0	charges per year
EMPTY CELL RUEPING		
EMPTY CELL RUEPING	2290	charges per year
EMPTY CELL LOWRY		
EMPTY CELL LOWRY	0	charges per year

D. STEAM DRY CONDITIONING PROCESS

TYPE OF STEAM PROCESS (MARK WITH AN X)		
LIVE		
CLOSED	X	
STEAM FLOW	3000	pounds per hour
HOURS PER CYCLE	2	hours per cycle

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

E. FLASHING PROCESS

TYPE OF STEAM PROCESS (MARK WITH AN X)			
LIVE			
CLOSED	X		
STEAM FLOW	3000	pounds per hour	
HOURS PER CYCLE	3	hours per cycle	
CYCLES PER YEAR	100	cycles per year	

F. DEHYDRATOR

VOLUME OF LIQUID PROCESSED	46,250	gallons	Annual Report
PERCENT PRESERVATIVE IN LIQUID	50	%	

G. WASTEWATER TREATMENT SYSTEM

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	1,168	pounds per year	Title V Application

II. FUGITIVE (NON-POINT SOURCE) AIR EMISSIONS

A. EQUIPMENT LOSSES

COMPONENT	NUMBER	ANNUAL HOURS	
PUMP SEALS	20	8,760	8760
VALVES	121	8,760	8760
SAFETY-RELIEF VALVES	3	8,760	8760
OPEN-ENDED LINES	0	8,760	8760
FLANGES	88	8,760	8760
SAMPLING CONNECTIONS	0	8,760	8760

B. RETORT DOOR

TEMPERATURE	160	°F	
TIME DOOR IS OPEN	9.48	minutes per opening	

C. SUMP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	720	pounds per year	Title V Application

D. SAP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	0	pounds per year	None

III. WATER DISCHARGES

WATER DISCHARGES OF NAPHTHALENE FROM WATER9 "Creosote Discharged In Wastewater"	0	pounds per year	Title V Application

IV. TRANSFERS OFF-SITE

ENTER QUANTITY OF CREOSOTE IN HAZARDOUS WASTE TRANSFERRED OFF-SITE	0	pounds	Annual Report

NOTE: 1: IF THE CYLINDER IS USED ONLY TO STEAM DRY WOOD, ENTER 0 FOR NUMBER OF CHARGES PER YEAR

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

FACILITY AND PROCESS DATA

			Suggested Default Values
FACILITY ID OR NAME	Dry PTE		
FACILITY LOCATION	Columbus, MS		
DATE	21-Aug-02		
RETORT CYLINDER LENGTH	100	feet	From Plant Data Tab
RETORT CYLINDER DIAMETER	8	feet	From Plant Data Tab
WOOD VOLUME PER CHARGE	2,364	cubic feet	From Plant Data Tab
AIR DRY CHARGES	2,190	PTE	From Annual Report
STEAM CONDITIONED CHARGES[1]	100	PTE	From Annual Report
BOULTON CYCLE TREATMENT CHARGES	0		From Annual Report
PRESERVATIVE PURCHASES	3,982,431	gallons per year	From Annual Report
AMBIENT PRESSURE	14.57	psia	From Weather Tab
MEAN ANNUAL MAXIMUM AMBIENT TEMPERATURE	73	°F	From Weather Tab
MEAN ANNUAL MINIMUM AMBIENT TEMPERATURE	52	°F	From Weather Tab
DAILY TOTAL SOLAR INSOLATION FACTOR	1,345	Btu per square feet per day	Refer to AP-42 Table 7.1-7

I. POINT SOURCE AIR EMISSIONS

A. WORK TANK VENTS

NUMBER OF WORK TANKS	4		Title V Application
PVRVs USED:	X	Mark X if applicable	
EQUALIZATION LINES USED	X	Mark X if applicable	
AVERAGE TANK DIAMETER	19	feet	From Plant Data Tab
AVERAGE TANK SHELL HEIGHT	29	feet	From Plant Data Tab
AVERAGE LIQUID HEIGHT	26	feet	From Plant Data Tab
MAXIMUM LIQUID HEIGHT	29	feet	From Plant Data Tab
AVERAGE WORK TANK CAPACITY	62,250	gallons	From Plant Data Tab
ROOF TYPE (MARK WITH AN X)		Cone	
	X	Dome	Title V Application
		Flat	
CONE ROOF			
TANK CONE ROOF SLOPE	0	feet tall per feet radius	
DOME ROOF			
TANK DOME RADIUS	11	feet	Avg. tank diameter
VAPOR PRESSURE AVERAGE	0.038	psia	0.038
DAILY MINIMUM VAPOR PRESSURE	0.038	psia	0.038
DAILY MAXIMUM VAPOR PRESSURE	0.038	psia	0.038
BREATHER VENT PRESSURE SETTING	0.000	psig	0 for heated tanks
BREATHER VENT VACUUM SETTING	0.000	psig	0 for heated tanks
IF TANK IS HEATED (MARK WITH AN X)	X		
LIQUID BULK TEMPERATURE	180	°F	180
ROOF PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	
SHELL PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

B. STORAGE TANK VENTS

NUMBER OF STORAGE TANKS	0		Title V Application
PVRVs USED	0	Mark X if applicable	Title V Application
EQUALIZATION LINES USED	0	Mark X if applicable	Title V Application
AVERAGE TANK DIAMETER		feet	
AVERAGE TANK SHELL HEIGHT		feet	
AVERAGE LIQUID HEIGHT		feet	
MAXIMUM LIQUID HEIGHT		feet	
AVERAGE STORAGE TANK CAPACITY		gallons	
ROOF TYPE (MARK WITH AN X)		Cone	
		Dome	
		Flat	
CONE ROOF			
TANK CONE ROOF SLOPE		feet tall per feet radius	
DOME ROOF			
TANK DOME RADIUS		feet	Avg. tank diameter
VAPOR PRESSURE AVERAGE		psia	0.038
DAILY MINIMUM VAPOR PRESSURE		psia	0.038
DAILY MAXIMUM VAPOR PRESSURE		psia	0.038
BREATHER VENT PRESSURE SETTING		psig	0 for heated tanks
BREATHER VENT VACUUM SETTING		psig	0 for heated tanks
IF TANK IS HEATED (MARK WITH AN X)			
LIQUID BULK TEMPERATURE		°F	180
ROOF PAINT			
CONDITION (MARK WITH AN X)		Good	
		Poor	
COLOR (MARK WITH AN X)		Aluminum, shiny	
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	
SHELL PAINT			
CONDITION (MARK WITH AN X)		Good	
		Poor	
COLOR (MARK WITH AN X)		Aluminum, shiny	
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	

C. RETORT VACUUM SYSTEM EXHAUST VENTS

RETORT CHAMBER TEMPERATURE	190	°F
FULL CELL TREATMENT		
FULL CELL TREATMENT	0	charges per year
AIR DRY CONDITIONED	2190	charges per year
STEAM CONDITIONED	100	charges per year
BOULTON CYCLE CONDITIONED	0	charges per year
EMPTY CELL RUEPING		
EMPTY CELL RUEPING	2290	charges per year
EMPTY CELL LOWRY		
EMPTY CELL LOWRY	0	charges per year

D. STEAM DRY CONDITIONING PROCESS

TYPE OF STEAM PROCESS (MARK WITH AN X)		
LIVE		
CLOSED	X	
STEAM FLOW	3000	pounds per hour
HOURS PER CYCLE	2	hours per cycle

Dry PTE
Dry PTE
Columbus, MS
August 21, 2002

E. FLASHING PROCESS

TYPE OF STEAM PROCESS (MARK WITH AN X)			
LIVE			
CLOSED	X		
STEAM FLOW	3000	pounds per hour	
HOURS PER CYCLE	3	hours per cycle	
CYCLES PER YEAR	100	cycles per year	

F. DEHYDRATOR

VOLUME OF LIQUID PROCESSED	46,250	gallons	Annual Report
PERCENT PRESERVATIVE IN LIQUID	50	%	

G. WASTEWATER TREATMENT SYSTEM

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	1,168	pounds per year	Title V Application

II. FUGITIVE (NON-POINT SOURCE) AIR EMISSIONS

A. EQUIPMENT LOSSES

COMPONENT	NUMBER	ANNUAL HOURS	
PUMP SEALS	20	8,760	8760
VALVES	121	8,760	8760
SAFETY-RELIEF VALVES	3	8,760	8760
OPEN-ENDED LINES	0	8,760	8760
FLANGES	88	8,760	8760
SAMPLING CONNECTIONS	0	8,760	8760

B. RETORT DOOR

TEMPERATURE	160	°F	
TIME DOOR IS OPEN	9.48	minutes per opening	

C. SUMP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	720	pounds per year	Title V Application

D. SAP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	0	pounds per year	None

III. WATER DISCHARGES

WATER DISCHARGES OF NAPHTHALENE FROM WATER9 "Creosote Discharged In Wastewater"	0	pounds per year	Title V Application

IV. TRANSFERS OFF-SITE

ENTER QUANTITY OF CREOSOTE IN HAZARDOUS WASTE TRANSFERRED OFF-SITE	0	pounds	Annual Report

NOTE: 1: IF THE CYLINDER IS USED ONLY TO STEAM DRY WOOD, ENTER 0 FOR NUMBER OF CHARGES PER YEAR

August 21, 2002
Dry PTE
Columbus, MS

1. Point Sources

Control Devices Used	Work Tanks			Storage Tanks			Steam Conditioning			Treatment		
	Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)	
Ventilation Air Tank / Knock-out	x	0.5	0.50			1.00	x	0.5	0.50	X	0.5	0.50
Condensers			1.00			1.00			1.00			1.00
Packed Bed Scrubber			1.00			1.00			1.00			1.00
Venturi Scrubber	x	0.75	0.25			1.00	x	0.75	0.25	X	0.75	0.25
Spray			1.00			1.00			1.00			1.00
Carbon			1.00			1.00			1.00			1.00
Thermal Oxidizer			1.00			1.00			1.00			1.00
Covers	x	0.8	0.20			1.00			1.00			1.00
Building			1.00			1.00			1.00			1.00
Vapor Balancing Line	x	0.5	0.50			1.00			1.00	X	0.5	0.50
Other			1.00			1.00			1.00			1.00
			1.00			1.00			1.00			1.00
Total Correction Factor			0.0125			1.0000			0.1250			0.0625

	Flash			Dehydrator			WWT		
	Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)	
Ventilation Air Tank / Knock-out	X	0.5	0.50	X	0.5	0.50			1.00
Condensers			1.00			1.00			1.00
Packed Bed Scrubber			1.00			1.00	X	0.75	0.25
Venturi Scrubber			1.00	X	0.75	0.25			1.00
Spray			1.00			1.00			1.00
Carbon			1.00			1.00			1.00
Thermal Oxidizer			1.00			1.00			1.00
Covers			1.00	X	0.8	0.20	X	0.8	0.20
Building			1.00			1.00			1.00
Vapor Balancing Line			1.00	X	0.5	0.50	X	0.5	0.50
Other			1.00			1.00			1.00
			1.00			1.00			1.00
Total Correction Factor			0.5000			0.0125			0.0250

II. Fugitive (Non-Point) Sources

Control Devices Used	Equipment			Retort Door			Sump Tanks			Sap Tanks		
	Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)		Mark with an X if applicable	Efficiency (fraction)	
Ventilation Air Tank / Knockout			1.00			1.00	x	0.5	0.50			1.00
Condensers			1.00			1.00			1.00			1.00
Packed Bed Scrubber			1.00			1.00	x	0.5	0.50			1.00
Venturi Scrubber			1.00			1.00			1.00			1.00
Spray			1.00			1.00			1.00			1.00
Carbon			1.00			1.00			1.00			1.00
Thermal Oxidizer			1.00			1.00			1.00			1.00
Covers			1.00			1.00	x	0.5	0.50			1.00
Building			1.00			1.00			1.00			1.00
Hoods			1.00			1.00			1.00			1.00
Other			1.00			1.00			1.00			1.00
			1.00			1.00			1.00			1.00
Total Correction Factor			1.0000			1.0000			0.1250			1.0000

August 21, 2002
Uncontrolled Emissions
Dry PTE **Columbus, MS**

I. Point Sources	Uncontrolled Emissions (pounds per year)					
	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	Creosote VOC	PAC
Work Tanks	170.6	19.4	8.0	7.0	391.8	0.4
Storage Tanks	0.0	0.0	0.0	0.0	0.0	0.0
Conditioning(Boulton)	0.0	0.0	0.0	0.0	0.0	0.0
Treatment	14,823.0	1,686.5	696.7	612.3	34,036.3	31.7
Flash	0.0	0.0	0.0	0.0	0.0	0.0
Dehydrator	730.0	83.1	34.3	30.2	1,676.2	1.6
WWT	1,167.6	132.8	54.9	48.2	2,681.0	2.5
Sub-Total	**16,891.3**	**1,921.8**	**793.9**	**697.7**	**38,785.3**	**36.2**

Total Point Source HAP Air Emissions **20,304.7 lb/yr**
10.2 ton/yr

II. Fugitives	Uncontrolled Emissions (pounds per year)					
	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	Creosote VOC	PAC
Equipment	705.8	80.3	33.2	29.2	1,620.7	1.5
Retort Door	469.4	53.4	22.1	19.4	1,077.9	1.0
Sumps	720.0	81.9	33.8	29.7	1,653.2	1.5
Sap Tanks	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	**1,895.2**	**215.6**	**89.1**	**78.3**	**4,351.8**	**4.1**

Total Fugitive (Non-Point) Source HAP Air Emissions **2,278.2 lb/yr**
1.1 ton/yr

Total Creosote VOC Point Source Emissions **38,785.3 lb/yr**
19.4 ton/yr

Total Creosote VOC Emissions **43,137.1 lb/yr**
21.6 ton/yr

Total HAP Emissions **22,582.9 lb/yr**
11.3 ton/yr

III. Water Discharges	Uncontrolled Emissions (pounds per year)					
	Naphthalene	Dibenzofuran	Quinoline	Biphenyl	Creosote VOC	PAC
Water Discharges	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

These are assumed "zero" since no creosote is discharged to POTW

100% Dry Treatment PTE
August 21, 2002
Controlled Emissions
Dry PTE
Columbus, MS

	Controlled Emissions (pounds per year)					
I. Point Sources	**Naphthalene**	**Dibenzofuran**	**Quinoline**	**Biphenyl**	**Creosote VOC**	**PAC**
Work Tanks	2.1	0.2	0.1	0.1	4.9	0.0
Storage Tanks	0.0	0.0	0.0	0.0	0.0	0.0
Conditioning(Boulton)	0.0	0.0	0.0	0.0	0.0	0.0
Treatment	926.4	105.4	43.5	38.3	2,127.3	2.0
Flash	0.0	0.0	0.0	0.0	0.0	0.0
Dehydrator	9.1	1.0	0.4	0.4	21.0	0.0
WWT	29.2	3.3	1.4	1.2	67.0	0.1
Sub-Total	**966.9**	**110.0**	**45.4**	**39.9**	**2,220.1**	**2.1**

Total Point Source HAP Air Emissions **1,162.3 lb/yr**
0.58 ton/yr

	Controlled Emissions (pounds per year)					
II. Fugitives	**Naphthalene**	**Dibenzofuran**	**Quinoline**	**Biphenyl**	**Creosote VOC**	**PAC**
Equipment	705.8	80.3	33.2	29.2	1,620.7	1.5
Retort Door	469.4	53.4	22.1	19.4	1,077.9	1.0
Sumps	90.0	10.2	4.2	3.7	206.7	0.2
Black Tie Storage(Model)	9,102	1,042	430	378	21,670	20
Sub-Total	**10,367.2**	**1,186.0**	**489.5**	**430.3**	**24,575.2**	**22.9**

Total Fugitive (Non-Point) Source HAP Air Emissions **12,473 lb/yr**
6.24 ton/yr

Total VOC Point Source Emissions **2,220.1 lb/yr**
1.1 ton/yr

Total VOC Emissions **26,795.4 lb/yr**
13.4 ton/yr

Total HAP Emissions **13,635.2 lb/yr**
6.8 ton/yr

	100% Dry PTE					
	Naphthalene	**Dibenzofuran**	**Quinoline**	**Biphenyl**	**Creosote VOC**	**PAC**
	lb/yr	**lb/yr**	**lb/yr**	**lb/yr**	**lb/yr**	**lb/yr**
Point Sources	967	110	45	40	2220	2
Fugative Sources	10367	1186	489	430	24575	23
Total Sources	11,334	1,296	535	470	26,795	25
Total Sources (TPY)	5.67	0.65	0.27	0.24	13.40	0.01
Title V Threshold	10.00	10.00	10.00	10.00	100.00	NA

Green PTE
Green PTE
Columbus, MS
August 20, 2002

FACILITY AND PROCESS DATA

			Suggested Default Values
FACILITY ID OR NAME	Green PTE		
FACILITY LOCATION	Columbus, MS		
DATE	20-Aug-02		
RETORT CYLINDER LENGTH	100	feet	From Plant Data Tab
RETORT CYLINDER DIAMETER	8	feet	From Plant Data Tab
WOOD VOLUME PER CHARGE	2,364	cubic feet	From Plant Data Tab
AIR DRY CHARGES	0		From Annual Report
STEAM CONDITIONED CHARGES[1]	100		From Annual Report
BOULTON CYCLE TREATMENT CHARGES	913		From Annual Report
PRESERVATIVE PURCHASES	1,659,346	gallons per year	From Annual Report
AMBIENT PRESSURE	14.57	psia	From Weather Tab
MEAN ANNUAL MAXIMUM AMBIENT TEMPERATURE	73	°F	From Weather Tab
MEAN ANNUAL MINIMUM AMBIENT TEMPERATURE	52	°F	From Weather Tab
DAILY TOTAL SOLAR INSOLATION FACTOR	1,345	Btu per square feet per day	Refer to AP-42 Table 7.1-7

I. POINT SOURCE AIR EMISSIONS

A. WORK TANK VENTS

NUMBER OF WORK TANKS	4		Title V Application
PVRVs USED:	X	Mark X if applicable	
EQUALIZATION LINES USED	X	Mark X if applicable	
AVERAGE TANK DIAMETER	19	feet	From Plant Data Tab
AVERAGE TANK SHELL HEIGHT	29	feet	From Plant Data Tab
AVERAGE LIQUID HEIGHT	26	feet	From Plant Data Tab
MAXIMUM LIQUID HEIGHT	29	feet	From Plant Data Tab
AVERAGE WORK TANK CAPACITY	62,250	gallons	From Plant Data Tab
ROOF TYPE (MARK WITH AN X)		Cone	
	X	Dome	Title V Application
		Flat	
CONE ROOF			
TANK CONE ROOF SLOPE	0	feet tall per feet radius	
DOME ROOF			
TANK DOME RADIUS	11	feet	Avg. tank diameter
VAPOR PRESSURE AVERAGE	0.038	psia	0.038
DAILY MINIMUM VAPOR PRESSURE	0.038	psia	0.038
DAILY MAXIMUM VAPOR PRESSURE	0.038	psia	0.038
BREATHER VENT PRESSURE SETTING	0.000	psig	0 for heated tanks
BREATHER VENT VACUUM SETTING	0.000	psig	0 for heated tanks
IF TANK IS HEATED (MARK WITH AN X)	X		
LIQUID BULK TEMPERATURE	180	°F	180
ROOF PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	
SHELL PAINT			
CONDITION (MARK WITH AN X)	X	Good	Title V Application
		Poor	
COLOR (MARK WITH AN X)	X	Aluminum, shiny	Title V Application
		Aluminum, matte	
		Gray, Light	
		Gray, Medium	
		Red	
		White	

Green PTE
Green PTE
Columbus, MS
August 20, 2002

Green PTE
Green PTE
Columbus, MS
August 20, 2002

E. FLASHING PROCESS

TYPE OF STEAM PROCESS (MARK WITH AN X)		
LIVE	X	
CLOSED		
STEAM FLOW	3000	pounds per hour
HOURS PER CYCLE	3	hours per cycle
CYCLES PER YEAR	100	cycles per year

F. DEHYDRATOR

VOLUME OF LIQUID PROCESSED	46,250	gallons	Annual Report
PERCENT PRESERVATIVE IN LIQUID	50	%	

G. WASTEWATER TREATMENT SYSTEM

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	1167.6	pounds per year	Title V Application

II. FUGITIVE (NON-POINT SOURCE) AIR EMISSIONS

A. EQUIPMENT LOSSES

COMPONENT	NUMBER	ANNUAL HOURS	
PUMP SEALS	20	8760	8760
VALVES	121	8760	8760
SAFETY-RELIEF VALVES	3	8760	8760
OPEN-ENDED LINES	0	8760	8760
FLANGES	88	8760	8760
SAMPLING CONNECTIONS	0	8760	8760

B. RETORT DOOR

TEMPERATURE	160	°F
TIME DOOR IS OPEN	9.48	minutes per opening

C. SUMP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	720	pounds per year	Title V Application

D. SAP TANKS

TOTAL NAPHTHALENE AIR EMISSIONS FROM WATER9	0	pounds per year	None

III. WATER DISCHARGES

WATER DISCHARGES OF NAPHTHALENE FROM WATER9 "Creosote Discharged In Wastewater"	0	pounds per year	Title V Application

IV. TRANSFERS OFF-SITE

ENTER QUANTITY OF CREOSOTE IN HAZARDOUS WASTE TRANSFERRED OFF-SITE	5053	pounds	Annual Report

NOTE: I: IF THE CYLINDER IS USED ONLY TO STEAM DRY WOOD, ENTER 0 FOR NUMBER OF CHARGES PER YEAR

TABLE 1. SYNTHETIC MINOR OPERATING PERMIT AIR EMISSION SUMMARY

SOURCE	VOCs (tons/yr)	NAPHTHALENE (tons/yr)	HAPs (tons/yr)
Additional Sources (previously insignificant)	1.84E-02	7.75E-03	1.00E-02
Groundwater Oil/Water Separator Lift Station	2.60E-02	1.09E-02	1.41E-02
WWTF Scrubber Recycle Tank	6.81E-02	NA	1.12E-03
Fuel Tanks (4 @ 25,000 gals)	6.81E-04	NA	1.12E-05
Fuel Tank (1 @1,000 gals)	1.03E-03	NA	NA
Space Heaters			
SUBTOTAL	1.14E-01	1.87E-02	2.52E-02
Permitted Point Sources	7.23	1.92	2.67
Fugitive Sources	1.21	2.81	3.66
TOTAL	8.55	4.75	6.36

NOTE:

1. The facility remains below Title V thresholds for criteria pollutants (VOCs) with the inclusion of additional sources (previously insignificant).
2. The facility remains below Title V thresholds for HAPs with the inclusion of additional sources (previously insignificant).
3. The air emissions from the additional sources (previously insignificant) are negligible.

TANK SUMMARY (page 1 of 2) SECTION H

1. Emission Point No./Name: EP014 - Fuel Tanks (4- 25,000 gals)

2. Was this tank constructed or modified after August 7, 1977? _____ yes __X__ no
If yes please give date and explain. _____

3. Product Stored: No. 2 Fuel Oil
If more than one product is stored, provide the information in 4.A-E for each product.

4. Tank Data:

A.	True Vapor Pressure at storage temperature:	0.0074	psia/°F
B.	Reid Vapor Pressure at storage temperature:	NA	psia/°F
C.	Density of product at storage temperature:	7.1	lb/gal
D.	Molecular Weight of product vapor at storage temperature:	130	lb/lbmol
E.	Throughput for most recent calendar year:	48,400	gal/yr
F.	Tank Capacity:	25,348	gal
G.	Tank Diameter:	12	feet
H.	Tank Height / Length:	30	feet
I.	Average Vapor Space Height:	3	feet
J.	Tank Orientation:	V	Vertical or Horizontal
K.	Type of Roof:	D	Dome or _____ Cone

L. Is the Tank Equipped with a Vapor Recovery System? Yes __X__ No _____
If Yes, describe on separate sheet of paper and attach. Indicate efficiency.

M. Check the Type of Tank:

__X__ Fixed Roof	_____ External Floating Roof
_____ Pressure	_____ Internal Floating Roof
_____ Variable Vapor Space	
_____ Other, describe:	_____

N. Check the Closest City:

__X__ Jackson, MS	_____ Birmingham, AL
_____ Memphis, TN	_____ Montgomery, AL
_____ New Orleans, LA	_____ Baton Rouge, LA

O Check the Tank Paint Color:

_____ Aluminum Specular	_____ Gray Light
_____ Aluminum Diffuse	_____ Gray Medium
__X__ Red	_____ White
_____ Other, describe: Black	_____

P. Tank Paint Condition: G Good or Poor

Q. Check Type of Tank Loading

1. Trucks and Rail Cars
   - _____ Submerged Loading of clean cargo tank
   - __X__ Submerged Loading : Dedicated Normal Service
   - _____ Submerged Loading : Dedicated Vapor Balance Service
   - _____ Splash Loading of clean cargo tank
   - _____ Splash Loading : Dedicated Normal Service
   - _____ Splash Loading : Dedicated Vapor Balance Service

2. Marine Vessels N/A
   - _____ Submerged Loading: Ships
   - _____ Submerged Loading: Barges

TANK SUMMARY (page 2 of 2) SECTION H

R. For External Floating Roof Tanks NA

1. Check the Type of Tank Seal:

Mechanical Shoe
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal
Liquid Mounted Resilient Seal
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal
Vapor Mounted Resilient Seal
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal

2. Type of External Floating Roof: _____ Pontoon
_____ Double-Deck

S. For Internal Floating Roof Tanks NA

1. Check the Type of Tank Seal:

Liquid Mounted Resilient Seal
_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal
Vapor Mounted Resilient Seal
_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal

2. Number of Roof Columns: _____
3. Length of Deck Seam _____ feet:
4. Area of Deck: _____ feet^2
5. Effective Column Diameter: _____ feet
6. Check the Type of Tank:

_____ Bolted with Column Supported Roof
_____ Welded with Column Supported Roof
_____ Bolted with Self-Supported Roof
_____ Welded with Self-Supported Roof

5. Emissions Summary

1. Breathing Loss: 4.19×10^{-3} ✓ HAPs - Negligible VOCs - 0.26 lb/day ✓
2. Working Loss: 1.93×10^{-3} ✓ HAPs - Negligible VOCs - 0.12 lb/day ✓
3. Total Emissions: 6.12×10^{-3} ✓ HAPs - Negligible VOCs - 0.38 lb/day

6. UTM Coordinates:

A. Zone 16 East B. North C. East

TANK SUMMARY (page 1 of 2) SECTION H

1. Emission Point No./Name: EP015 - Fuel Tank (1- 1,000 gals)

2. Was this tank constructed or modified after August 7, 1977?_____ yes __X__ no
If yes please give date and explain. _____

3. Product Stored: No. 2 Fuel Oil
If more than one product is stored, provide the information in 4.A-E for each product.

4. Tank Data:

A.	True Vapor Pressure at storage temperature:	0.0074	psia/°F
B.	Reid Vapor Pressure at storage temperature:	NA	psia/°F
C.	Density of product at storage temperature:	7.1	lb/gal
D.	Molecular Weight of product vapor at storage temperature:	130	lb/lbmol
E.	Throughput for most recent calendar year:	48,400	gal/yr
F.	Tank Capacity:	1,000	gal
G.	Tank Diameter:	4	feet
H.	Tank Height / Length:	10.5	feet
I.	Average Vapor Space Height:	1	feet

J. Tank Orientation: H Vertical or _____ Horizontal

K. Type of Roof: D Dome or _____ Cone

L. Is the Tank Equipped with a Vapor Recovery System? Yes __X__ No _____
If Yes, describe on separate sheet of paper and attach. Indicate efficiency.

M. Check the Type of Tank:

__X__ Fixed Roof
_____ External Floating Roof
_____ Pressure
_____ Internal Floating Roof
_____ Variable Vapor Space
_____ Other, describe: _____

N. Check the Closest City:

__X__ Jackson, MS
_____ Birmingham, AL
_____ Memphis, TN
_____ Montgomery, AL
_____ New Orleans, LA
_____ Baton Rouge, LA

O Check the Tank Paint Color:

_____ Aluminum Specular
_____ Gray Light
_____ Aluminum Diffuse
_____ Gray Medium
__X__ Red
_____ White
_____ Other, describe: Black _____

P. Tank Paint Condition: G Good or Poor

Q. Check Type of Tank Loading

1. Trucks and Rail Cars

_____ Submerged Loading of clean cargo tank
__X__ Submerged Loading : Dedicated Normal Service
_____ Submerged Loading : Dedicated Vapor Balance Service
_____ Splash Loading of clean cargo tank
_____ Splash Loading : Dedicated Normal Service
_____ Splash Loading : Dedicated Vapor Balance Service

2. Marine Vessels N/A

_____ Submerged Loading: Ships
_____ Submerged Loading: Barges

TANK SUMMARY (page 2 of 2) SECTION H

R. For External Floating Roof Tanks NA

1. Check the Type of Tank Seal:

Mechanical Shoe
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal
Liquid Mounted Resilient Seal
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal
Vapor Mounted Resilient Seal
_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal

2. Type of External Floating Roof: _____ Pontoon
_____ Double-Deck

S. For Internal Floating Roof Tanks NA

1. Check the Type of Tank Seal:

Liquid Mounted Resilient Seal
_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal
Vapor Mounted Resilient Seal
_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal

2. Number of Roof Columns: _____
3. Length of Deck Seam _____ feet:
4. Area of Deck: _____ feet^2
5. Effective Column Diameter: _____ feet
6. Check the Type of Tank:

_____ Bolted with Column Supported Roof
_____ Welded with Column Supported Roof
_____ Bolted with Self-Supported Roof
_____ Welded with Self-Supported Roof

5. Emissions Summary
   1. Breathing Loss: 4.19×10^{-5} HAPs - Negligible VOCs - 2.55×10^{-3} ✓
   2. Working Loss: 1.93×10^{-5} HAPs - Negligible VOCs - 1.18×10^{-3} ✓
   3. Total Emissions: 6.12×10^{-5} HAPs - Negligible VOCs - 3.73×10^{-3} ✓
6. UTM Coordinates:

A. Zone 16 East B. North C. East

SUPPORT CALCULATIONS

JOB 0168/3

SHEET NO. 1 OF

CALCULATED BY STM DATE 11-02-95

CHECKED BY SLK DATE 11-02-95

SCALE

AquAeTer
215 Jamestown Park, Suite 204
Brentwood, TN 37027
(615) 373-8532 FAX (615) 373-8512

KMCC COLUMBUS
EMISSIONS CALCULATIONS

A. FUEL TANKS

4 @ 25,000 gals

$$LB: \frac{23.29 \text{ lbs VOC}}{\text{year}} * \frac{1 \text{ year}}{365 \text{ days}} * 4 \text{ tanks} = 2.55 \times 10^{-1} \text{ lbs/day}$$

$$LW: \frac{10.75 \text{ lbs VOC}}{\text{year}} * \frac{1 \text{ year}}{365 \text{ days}} * 4 \text{ tanks} = 1.18 \times 10^{-1} \text{ lbs/day}$$

Therefore,

2.55×10^{-1} lbs VOC/day * 0.0164 (% Benzene) = 4.18×10^{-3} lbs/day
1.18×10^{-1} lbs VOC/day * 0.0164 (% Benzene) = 1.94×10^{-3} lbs/day

1 @ 1,000

$$LB: \frac{23.29 \text{ lbs VOC}}{\text{year}} * \frac{1 \text{ year}}{365 \text{ days}} * \frac{1{,}000 \text{ gals}}{25{,}000 \text{ gals}} = 2.55 \times 10^{-3} \text{ lbs/day}$$

$$LW: \frac{10.75 \text{ lbs VOC}}{\text{year}} * \frac{1 \text{ year}}{365 \text{ days}} * \frac{1{,}000 \text{ gals}}{25{,}000 \text{ gals}} = 1.18 \times 10^{-3} \text{ lbs/day}$$

Therefore,

2.55×10^{-3} lbs VOC/day * 0.0164 (% Benzene) = 4.18×10^{-5} lbs/day
1.18×10^{-3} lbs VOC/day * 0.0164 (% Benzene) = 1.94×10^{-5} lbs/day

Kerr-McGee Chemical LLC

Forest Products Division

Columbus Facility

EPA I.D. No. MSD 990866329

Post-Closure Permit Application, Part B

May 12, 2000

Revised: September 21, 2000

Kerr-McGee Chemical LLC

Forest Products Division

Columbus Facility

EPA I.D. No. MSD 990866329

Post-Closure Permit Application, Part B

May 12, 2000

Revised: September 21, 2000

KERR-McGEE CHEMICAL LLC
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

September 21, 2000

Mr. Louis Crawford, PE
Environmental Permits Division
Mississippi Department of Environmental Quality
Post Office Box 10385
Jackson, Mississippi 39289-0385

Re: RCRA Permit Application Comments
Kerr-McGee Chemical LLC
Forest Products Division - Columbus Facility
Columbus, Lowndes County
MSD 990 866 329

Dear Mr. Crawford,

Kerr-McGee Chemical LLC received your comment letter on July 31, 2000. This letter serves as a response to your comment letter. This letter will respond to each comment and two (2) copies of the revised Part B application are enclosed for your review.

Please review the enclosed responses and revised application, feel free to contact me, Steve Ladner at (405) 270-2625 if you have any further questions or needs. Thank you for your time and consideration in this matter.

Sincerely,

KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

Stephen A. Ladner
Staff Environmental Specialist

Cc: Nick Bock, KMC LLC
Ron Murphey, KMC LLC - Columbus
Russ McLean, US EPA Region IV

FOREST PRODUCTS

KMC LLC RESPONSE TO MISSDEQ COMMENTS

General - Overall

1). KMC LLC will send a copy of the application to Russ McLean in U.S. EPA Region IV.

2) As recommended by the Miss DEQ, KMC LLC will incorporate the following as Appendices: Post-Closure Plan - Appendix F, Corrective Action Plan - Appendix H, and Groundwater Sampling & Analysis Plan - Appendix J.

3) As recommended by the Miss DEQ, KMC LLC will remove the contingency plan and the personnel training plan from the permit application.

4) As recommended by the Miss DEQ, KMC LLC will include information on the existing SWMU's. This information is in Section II on pages 1 and 2.

5) KMC LLC will correct the existence of two "Section 5" tabs.

6) KMC LLC will review the page numbering scheme and correct any inconsistencies

7) KMC LLC has included a certification as per MHWMR270.11(d). the certification statement is included in Section 1 on page 8.

8) KMC LLC has provided a specific street address in Section III.A

9) KMC LLC mistakenly included the wrong P.O. Box. Instead of P.O. Box 906, the current address is P.O. Box 9310, Columbus , MS 39701.

10) KMC LLC will include the facility's air permit number in Section X of the Part A portion of the permit application.

11) KMC LLC will change Section XIV of the Part A portion of the permit to reflect only the closed surface impoundment's that manages K001 waste.

12) KMC LLC has included three maps satisfying the conditions outlined in Section XV of the Part A portion of the permit.

13) KMC LLC has provided the printed name of the individual signing the application in Section XVIII of the Part A portion of the application.

SECTION 2, ATTACHMENT 1

14) KMC LLC has located an aerial photo that displays a clearer resolution and replaces Figure 2-2

15) KMC LLC has changed this sentence to more accurately reflect the information detailed on the facility map contained in Appendix D. Appendix B contains detailed topographic maps.

SECTION 2, ATTACHMENT 2

16) KMC LLC has changed the facility map in Appendix D to reflect the plural expression "closed impoundments" . Appendix F will be changed to reflect the same expression "closed impoundments".

SECTION 3

17) KMC LLC has changed the paragraph to comply with the information required to satisfy MHWHR 264.118(b)(3). KMC LLC entered the Corporate name, address, and phone number for responsibility of post-closure care. This correction is located page 22 of Section 3.

18) KMC LLC has changed Table 3-2 Post-Closure Inspection Report to include the time of the inspection. This change is located on page 25 of Section 3.

19) KMC LLC has changed Table 3-2 Post-Closure Inspection Report to include a requirement to check the locks on the monitoring wells. This change is located on page 25 of Section 3.

20) KMC LLC has included a statement explaining that during the annual engineering survey, benchmark integrity will be addressed. This changed is noted on page 27.

21) KMC LLC has changed the Inspection Schedule to reflect that inspections will occur after significant storm events. This change is reflected on page 26.

22) KMC LLC has provided information about security in the text of the report in compliance with MHWMR 264.14. This change is reflected on page 27.

23) KMC LLC has provided additional explanations in the text to satisfy MHWMR 270.14(b)(6). This change is reflected in the under the subheading of Preparedness and Prevention, page 27.

24) KMC LLC has changed the wording from "K001 Appendix VII constituents" to "K001 constituents". This change is noted on page 31.

25) KMC LLC has included as Appendix G the Post-Closure notices from 1987 as required in MHWMR 264.119(a) and (b). Additionally, language has been included in the application specifying that MHRMR 264.119 (c) will be followed if necessary and that certification under MHWMR 264.120 will be provided.

26) KMC LLC has included the most recent copy of the Financial Assurance in Appendix K.

27) KMC LLC has amended the language in the Groundwater Monitoring Section to discuss the limited off-site contamination in the groundwater noted to the east. This changed is noted on page 29.

28) KMC LLC has included a copy of the Sampling and Analysis Plan without the attachments as per your suggestion in Appendix J.

29) KMC LLC is in agreement that CMW-28, CMW-29, and CMW-30 should be added to the permitted wells are part of the groundwater monitoring network as Boundary Wells. KMC LLC is also in agreement that CMW-27 should be included as an effectiveness well this change is noted in page 30.

30) The costs for corrective action as well as financial assurance are provided in Appendix K.

31) KMC LLC has included language in the application for actions to be taken if new Appendix IX constituents be detected. This language is noted on page 32.

SECTION 5.0 - ENGINEERING FEASIBILITY STUDY

32) KMC LLC has changed the language as per your suggestion to state " .... in the 1999 Groundwater Monitoring and Effectiveness Report, which is included as Appendix F of this application". The change is noted on page 49.

33) KMC LLC has changed the map in Appendix D to only include monitoring wells that are sampled in the permit.

34) KMC LLC has changed the language on page 4 of Appendix F to "K001 constituents as listed in MHWMR Part 261, Appendix VII"

35) KMC LLC has reconciled the language regarding the trenches.

TABLE OF CONTENTS

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved, OMB No. 2050-0034 Expires 10/31/02
GSA No. 0248-EPA-OT

For EPA Regional Use Only		
Date Received Month Day Year		

EPA
United States Environmental Protection Agency
Washington, DC 20460

Hazardous Waste Permit Application Part A

(Read the Instructions before starting)

RECEIVED
26
DEQ-EPD

I. Facility's EPA ID Number *(Mark 'X' in the appropriate box)*

[X] A. First Part A Submission

[ ] B. Revised Part A Submission (Amendment # _____)

C. Facility's EPA ID Number	D. Secondary ID Number *(If applicable)*
MSD990866329	

II. Name of Facility

Kerr-McGee Chemical LLC

III. Facility Location *(Physical address not P.O. Box or Route Number)*

A. Street

2300 14th Ave North

Street *(Continued)*

City or Town	State	Zip Code
Columbus	MS	39701-

County Code (If known)	County Name
	Lowndes

B. Land Type (Enter code)	C. Geographic Location: LATITUDE (Degrees, minutes, & seconds)	LONGITUDE (Degrees, minutes, & seconds)	D. Facility Existence Date: Month Day Year
P	33 30 03 0	88 24 00	1926

IV. Facility Mailing Address

Street or P.O. Box

PO Box 9310

City or Town	State	Zip Code
Columbus	MS	39701-

V. Facility Contact *(Person to be contacted regarding waste activities at facility)*

Name *(Last)*	*(First)*
Murphey	Ron

Job Title	Phone Number *(Area Code and Number)*
Plant Manager	662-328-7551

VI. Facility Contact Address *(See instructions)*

A. Contact Address: Location	Mailing	Other	B. Street or P.O. Box
X			

City or Town	State	Zip Code
		-

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved, OMB No. 2050-0034 Expires 10/31/02
GSA No. 0248-EPA-OT

EPA ID Number *(Enter from page 1)*: MSD990866329

Secondary ID Number *(Enter from page 1)*:

VII. Operator Information *(See instructions)*

A. Name of Operator: Kerr-McGee Chemical LLC

Street or P.O. Box: PO Box 25861

City or Town: Oklahoma City

State: OK

ZIP Code: 73125-

Phone Number *(Area Code and Number)*: 405-270-2625

B. Operator Type: P

C. Change of Operator Indicator: Yes [ ] No [X]

Date Changed: Month / Day / Year

VIII. Facility Owner *(See instructions)*

A. Name of Facility's Legal Owner: Kerr-McGee Chemical LLC

Street or P.O. Box: PO Box 25861

City or Town: Oklahoma City

State: OK

ZIP Code: 73125-

Phone Number *(Area Code and Number)*: 405-270-1313

B. Owner Type: P

C. Change of Owner Indicator: Yes [ ] No [ ]

Date Changed: Month / Day / Year

IX. NAICS Codes *(in order of significance; start in left box)*

First: 2491 (Description)

Second: (Description)

Third: (Description)

Fourth: (Description)

X. Other Environmental Permits *(See instructions)*

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
N	MSP0900021	WASTEWATER TO POTW
N	MSR2200010	STORMWATER
R	HW9032901	STATE HW PERMIT
R	MSD990866329	EPA HSWA PERMIT
	1680000020	AIR PERMIT

EPA ID Number *(Enter from page 1)*: M S D 9 9 0 8 6 6 3 2 9

Secondary ID Number *(Enter from page 1)*:

XI. Nature of Business *(Provide a brief description)*

Wood preserving creosote is used as the preservative to pressure-treat wood products.

XII. Process Codes and Design Capacities

A. PROCESS CODE - *Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in item XIII.*

B. PROCESS DESIGN CAPACITY - *For each code entered in column A, enter the capacity of the process.*

1. **AMOUNT** - *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*
2. **UNIT OF MEASURE** - *For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.*

C. PROCESS TOTAL NUMBER OF UNITS - *Enter the total number of units used with the corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, Or Refining Furnace	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Hour; Liters Per Hour; or Million Btu Per Hour
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R
Million Btu Per Hour	X
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu Per Hour	I

EPA ID Number *(Enter from page 1)*: M S D 9 9 0 8 6 6 3 2 9

Secondary ID Number *(Enter from page 1)*:

XII. Process Codes and Design Capabilities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533,788 gallons.

Line Number		A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. PROCESS DESIGN CAPACITY 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S 0 2	5 3 3 . 7 8 8	G	0 0 1	
	1	S 0 4	708,400 CLOSED	G	001	
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
1	0					
1	1					
1	2					
1	3					

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. PROCESS DESIGN CAPACITY 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T 0 4				In-situ Vitrification
	1					
	2					
	3					
	4					

EPA ID Number *(Enter from page 1)*: MSD990866329

Secondary ID Number *(Enter from page 1)*:

XIV. Description of Hazardous Wastes

A. **EPA HAZARDOUS WASTE NUMBER** - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. **ESTIMATED ANNUAL QUANTITY** - *For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C **UNIT OF MEASURE** - *For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. **PROCESS CODES:**

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/ or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of item XIV-D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in item XIV-E.*

2. **PROCESS DESCRIPTION:** *If a code is not listed for a process that will be used, describe the process in the space provided on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number	A. EPA HAZARD WASTE NO. (Enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (Enter code)	D. PROCESS (1) PROCESS CODES (Enter)	D. PROCESS (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X 1	K 0 5 4	900	P	T 0 3 D 8 0	
X 2	D 0 0 2	400	P	T 0 3 D 8 0	
X 3	D 0 0 1	100	P	T 0 3 D 8 0	
X 4	D 0 0 2				Included With Above

EPA ID Number *(Enter from page 1)*: MSD990866329

Secondary ID Number *(Enter from page 1)*:

XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)	D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
1	K001	0			
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					

EPA ID Number *(Enter from page 1)*	Secondary ID Number *(Enter from page 1)*
MSD990866329	

XV. Map

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (See instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XVIII. Certification(s)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner Signature	Date Signed 9/25/00
Name and Official Title (Type or print) ROBERT P. MICHEL, VICE PRESIDENT	
Owner Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature	Date Signed
Name and Official Title (Type or print)	

XIX. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (Refer to instructions for more information)

CERTIFICATION STATEMENT

As per MHWMR 270.11(d) the following serves as a certification statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Robert P. Michel Vice President - Forest Products Division KMC LLC

SECTION 2

INTRODUCTION

PURPOSE AND ORGANIZATION

Kerr McGee Chemical LLC (KMC LLC) is submitting the revised re-application for the Part B Post-Closure Permit that expires on October 15, 2000 for the Columbus, Mississippi facility. The original re-application was submitted on May 12, 2000. The revised re-application is in response to a comment letter received from Miss DEQ on July 31, 2000. The KMC LLC responses are itemized in the cover letter for this application and included in the text where appropriate. The application is organized in accordance with the subject and structure requirements outlined in the post-closure permit completeness checklist contained in Appendix A. Where possible and feasible, KMC LLC has referenced previous work and documents and included those references as attachments or appendices where appropriate. Items that have changed during the past 10 years have been updated in the text.

Section 1 contains the Hazardous Waste Permit Application Part A. Section 2 contains the site description and a description of the production process for the facility. Section 3 contains an updated Post-closure Care Plan. Section 4 contains the Area Geology and Site Hydrology. Section 5 contains an Engineering Feasibility Report.

SITE DESCRIPTION

The KMC LLC facility pressure treats railroad products including wooden crossties, switch ties, and timbers (SIC 2491). The main plant occupies approximately 90 acres and is located in Columbus, Mississippi. Attachment I in this section describes the history. Figure 2-1, contained in Attachment I, shows the general location of the facility. Figure 2-2, contained in Attachment I, presents an aerial photograph of the plant and surrounding terrain. Appendix B presents two topographic maps of Columbus and the located plant site. Appendix C presents a Flood Insurance Rate map for the area which indicates that a 100 year flood will not impact the closed impoundment's. Appendix D presents a facility map showing the processing units and the permitted groundwater monitoring network. Appendix E presents a legal description of the facility's location. Appendix F is a copy of the original Post-Closure Care Plan.

SOLID WASTE MANAGEMENT UNITS

Solid Waste Management Area I - Retort Area

This is designated as the Retort Area and is comprised of: treating cylinders, sumps, and is in an area of containment. This an area of known historical impact, with soil and groundwater impacts clearly defined. It is currently undergoing remediation. No additional investigation was required as part of the RFI.

Solid Waste Management Area 2 - Drip Pad Area

This is the area of the historical drip track, and the current drip pad. The drip track area was excavated as part of source removal efforts in 1988. The drip pad is contained and prevents releases to the environment. This area is part of the groundwater monitoring and recovery network. No additional work was required through the RFI.

Solid Waste Management Area III - Tank Farm Area

This area experienced source removal efforts in 1988 and is currently completely in secondary containment. The area is also part of the groundwater monitoring and recovery network. No additional work required through the RFI.

Solid Waste Management Area IV - Recovery System/Wastewater Treatment

This area consists of the primary and secondary oil/water separators, holding tanks, and wastewater piping. This area is included in the current groundwater monitoring and cleanup. The RFI did require additional soil borings in this area.

Solid Waste management Area V - Cooling Tower Basin

This area is still in operation and is where the holding tanks and the former cooling tower surface impoundment was. The RFI required an additional soil boring and three surface soil samples. Groundwater in this area is under the influence of both the groundwater monitoring network and recovery system.

Solid Waste Management Area VI - Drainage Ditches

Storm water drainage ditches on and off site have been tested during the RFI investigation and are currently being evaluated under the direction of US EPA Region IV. This area will require additional testing.

Solid Waste Management Area VII - Black Tie Storage Area

This area consists of treated wood storage and underwent testing during the RFI. At this time, no further testing is warranted.

PRODUCTION PROCESS

Attachment II contains a detailed description of the production process.

SITE DESCRIPTION

The facility has been in operation since 1928, manufacturing pressure treated railroad products including wooden crossties, switch ties and timbers (SIC Code 2491). KMCC-FPD purchased the facility in 1964. The main plant occupies approximately 90 acres. Upon its purchase, the facility became part of Moss America Corporation, a wholly owned subsidiary of Kerr-McGee Corporation. In 1974, Moss America Became the Forest Products Division of Kerr-McGee Chemical Corporation, a wholly owned subsidiary of Kerr-McGee Corporation. Figure 2-1 shows the general location of the facility.

Throughout its history, the facility has utilized sawn lumber from within a 300 mile radius to produce its railroad products. Creosote and creosote coal tar solutions are the only preservatives utilized at the facility since 1976.

Currently the facility manufactures product for the Burlington Northern Railroad, Norfolk Southern Railroad and several regional railroad contractors. The facility has the capacity to manufacture up to 1,000,000 railroad ties per year.

Figure 2-2 presents an aerial photograph of the plant and surrounding terrain. Appendix B presents two USGS topographical maps of Columbus and the located plant site. Appendix C presents a Flood Insurance Rate Map for the area which indicates that a 100-year flood will not impact the closed impoundments. Appendix D presents a map showing the location of processing units and the groundwater monitoring network. Appendix E presents a legal description of the facility's location.

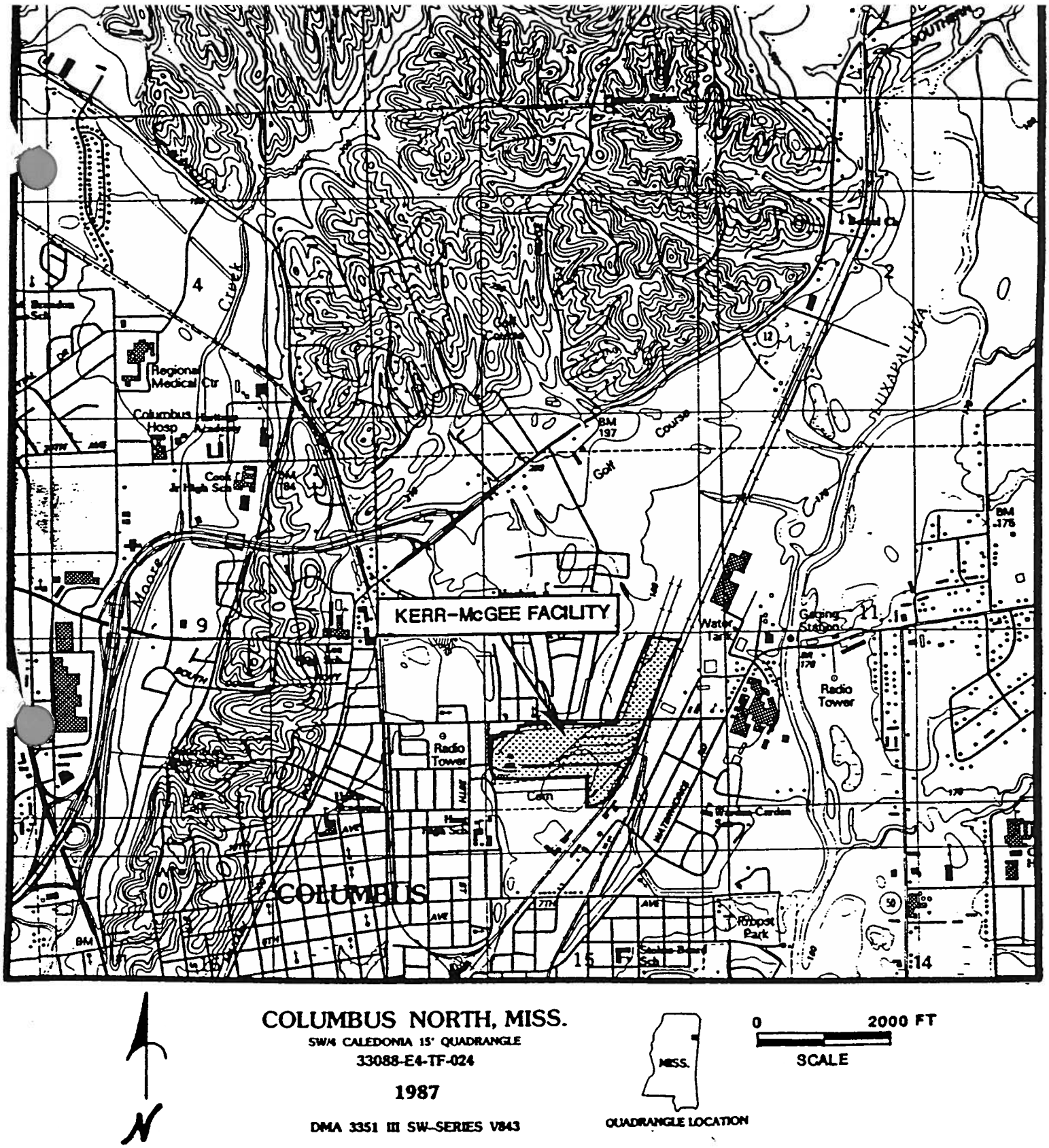
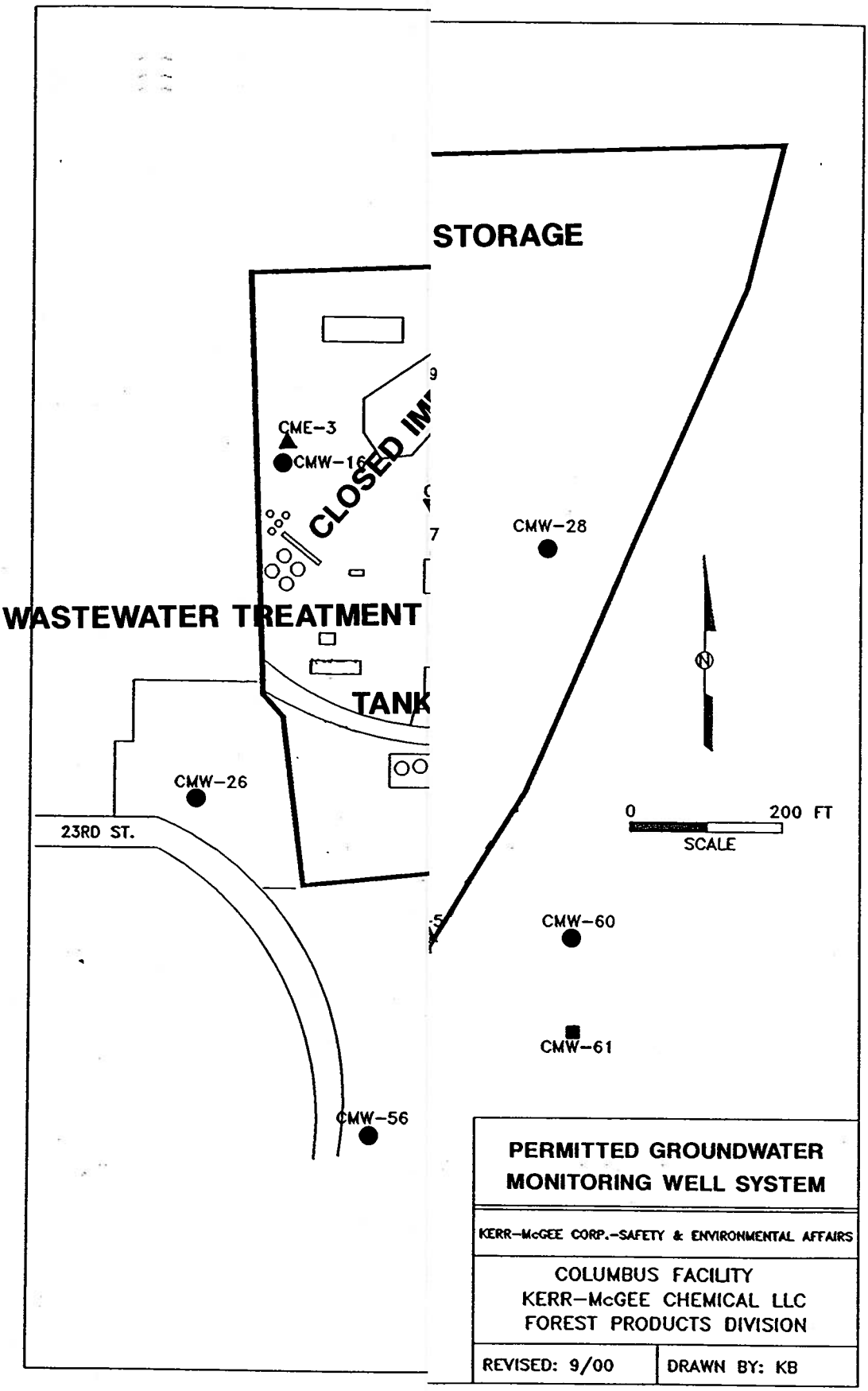


FIGURE 2-1: TOPOGRAPHIC MAP SHOWING THE COLUMBUS FACILITY, KERR-MCGEE CHEMICAL CORPORATION, FOREST PRODUCTS DIVISION, COLUMBUS, MISSISSIPPI


STORAGE
CME-3
CMW-16
CLOSED IM
CMW-28
WASTEWATER TREATMENT
TANK
CMW-26
23RD ST.
0
200 FT
SCALE
CMW-60
CMW-61
CMW-56
PERMITTED GROUNDWATER MONITORING WELL SYSTEM
KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS
COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION
REVISED: 9/00
DRAWN BY: KB

PROCESS DESCRIPTION

The production process utilizes creosote and creosote coal tar solutions to produce pressure treated railroad products. Lumber is obtained from a 300 mile radius of the Columbus, MS facility. Pentachlorophenol was also used as a preservative until 1976. The sawn lumber is shipped in by either railcar or truck. The creosote and creosote coal tar solutions are also shipped in by railcar and unloaded into bulk storage tanks. Figure 2-3 presents the general process flow schematic for the production of the railroad products.

Prior to treating with the preservative, the sawn lumber is prepared by sorting according to type of wood and grade (quality). This is conducted at the unloader. The process includes sawing the wood to the appropriate length. After sorting, the wood is seasoned. This process involves drying the wood to remove moisture allowing for penetration and retention of the wood preserving solution in the wood. The seasoning process can be conducted in one of two manners; air seasoning or artificial seasoning using the Bolton process. Air seasoning involves stacking the untreated lumber in the green tie yard for a period of 8-12 months. The wood is stacked utilizing the German stacking method which promotes circulation of air around the wood to expedite drying. The artificial seasoning or Bolton process can be used to eliminate the 8-12 month air seasoning period. This process is carried out in the facility's treating cylinder (retort). The process utilizes hot preservative (creosote or creosote coal tar solution) to boil the water out of the wood. This process takes place at a temperature of 180^{o}F to 200^{o}F with a vacuum applied to the retort. As the wood heats up to the boiling point of water, the water in the wood moves to the surface of the wood and into the preservative. The vacuum reduces the boiling point of the creosote water mixture to facilitate the dehydration of the mixture allowing for the removal of water from the preservative. The water vapors (sap water) is removed from the retort utilizing the vacuum. The sap water

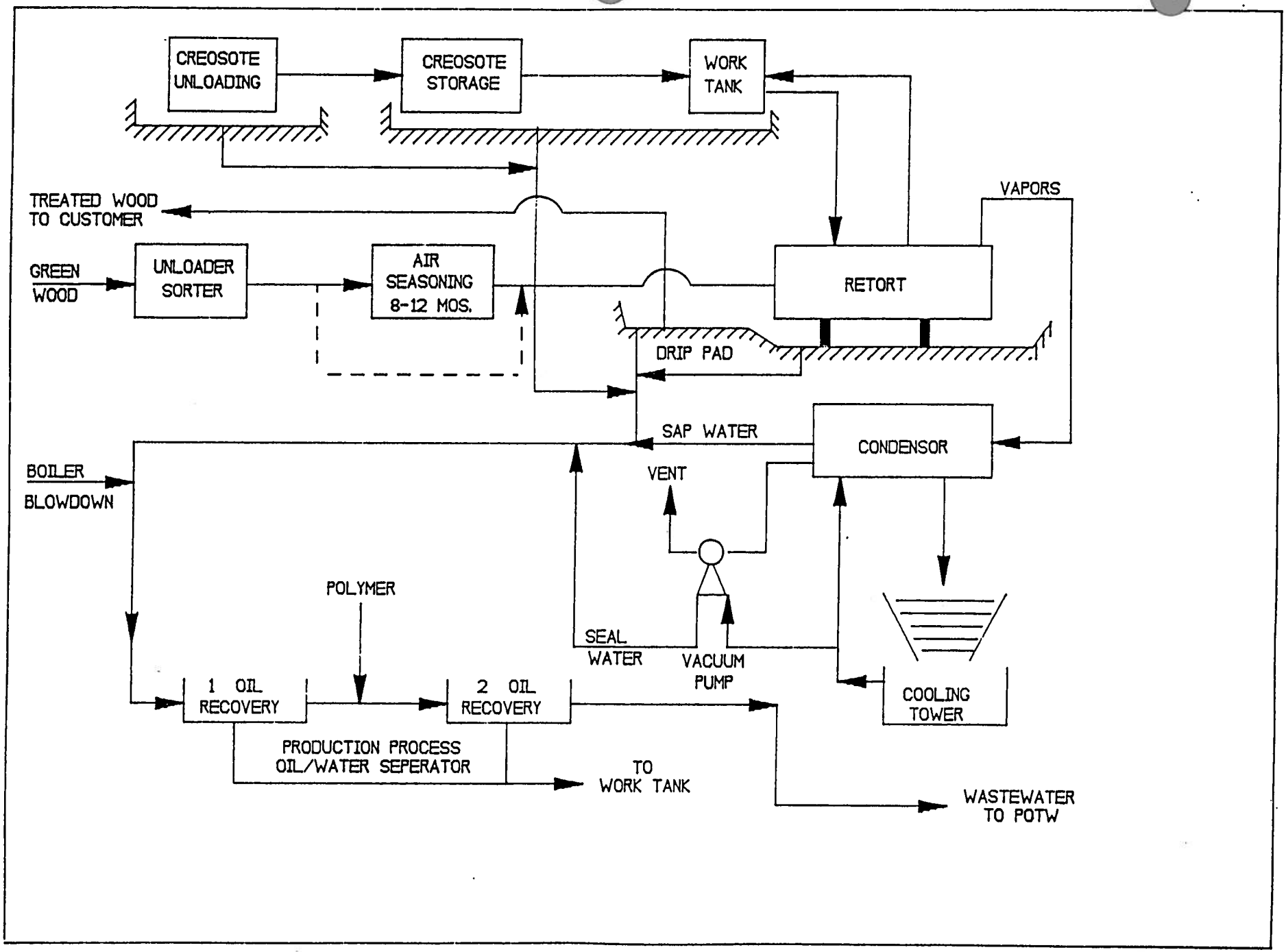


FIGURE 2-3 : WOOD TREATING PROCESS FLOW SCHEMATIC, COLUMBUS, MS

is condensed in a shell and tube condensor and discharged to the facility's production process oil/water separators to recover preservative which are also condensed in the shell and tube condensors. The Bolton cycle typically requires 12-16 hours to remove the sap water from the wood. In general, approximately 6-8 pounds (1 gal.) of water per cubic foot of wood is removed.

Upon completion of the air drying or Bolton process, the wood is pressure treated. The pressure treating process takes place within the retort. If the wood was artificially seasoned using the Bolton process, the wood is immediately pressure treated in the same retort utilized to artificially season the wood. The wood is not removed from the retort between the Bolton process and pressure treating process.

The pressure treating cycle is begun by applying an initial air pressure of 30-60 psi to the treating cylinder. The cylinder is then filled with creosote or creosote coal tar solution and additional pressure is applied to force the preservative into the wood. The treating cycle is conducted at a pressure of 200 psi and a temperature of 180^{o}F. Approximately 6-8 pounds (1 gal.) of preservative per cubic foot of wood is injected into the wood. When the desired amount of creosote has been injected into the wood, the pressure on the retort is released and the preservative solution pumped back to the work tank. A vacuum is applied to the cylinder to extract excess preservative (kick back) from the wood. The excess material drawn from the wood is pumped back to the work tank.

Upon completion of the vacuum cycle, the vacuum is broken and the cylinder door is opened. The treated wood is removed from the cylinder and held on the concrete drip pad for a period of 4-12 hours. This allows for the collection of any drippage prior to shipping or yarding the treated wood. The drippage is collected and recycled back to the production process oil/water separator to recover the excess preservative.

and a polymer feet system. Prior to upgrading the oil recovery system, the process waters discharged to the impoundments would contain up to 10,000 ppm oil and grease (preservative). The efficiency of the recovery system has been greatly enchanced allowing the facility to discharge directly to the city sanitary sewer withing pretreatment standards. The average oil and grease content discharged is less than 50 ppm.

A new cooling tower was also installed in 1978. The purpose of the cooling tower was to eliminate the use of the impoundment system for cooling process water. The cooling tower is a non-contact cooling system. Water is recycled from the cooling tower to the Nash vacuum pumps within the production process.

A concrete drip pad was installed in 1988. The purpose of the drip pad is to collect any excess preservative which may drip off the wood upon removal from the cylinder. The installation of the drip pad included removal of all visibly contaminated soils. Although not classified as hazardous wastes, KMCC-FPD disposed of the contaminated soils at the Chemical Waste Management Hazardous Waste Landfill in Emile, Alabama.

Figure 2-4 presents a cross-section of the drip pad as constructed. Construction included installation of a secondary clay liner, a leak collection/detection system, and an eighteen inch thick concrete pad. The pad is curbed to insure collection of all drippage and stormwater runoff. The pad is sloped to a central collection point. Drippage collected on the pad is discharged to the production process oil/water separators. Excess stormwater is discharged directly to the facility's stormwater collection system discussed later in this chapter.

In 1988, the facility installed a concrete containment system in the tank farm area. This included removal of visibly contaminated soils. The soils were disposed of at the Chemical Waste Management Hazardous

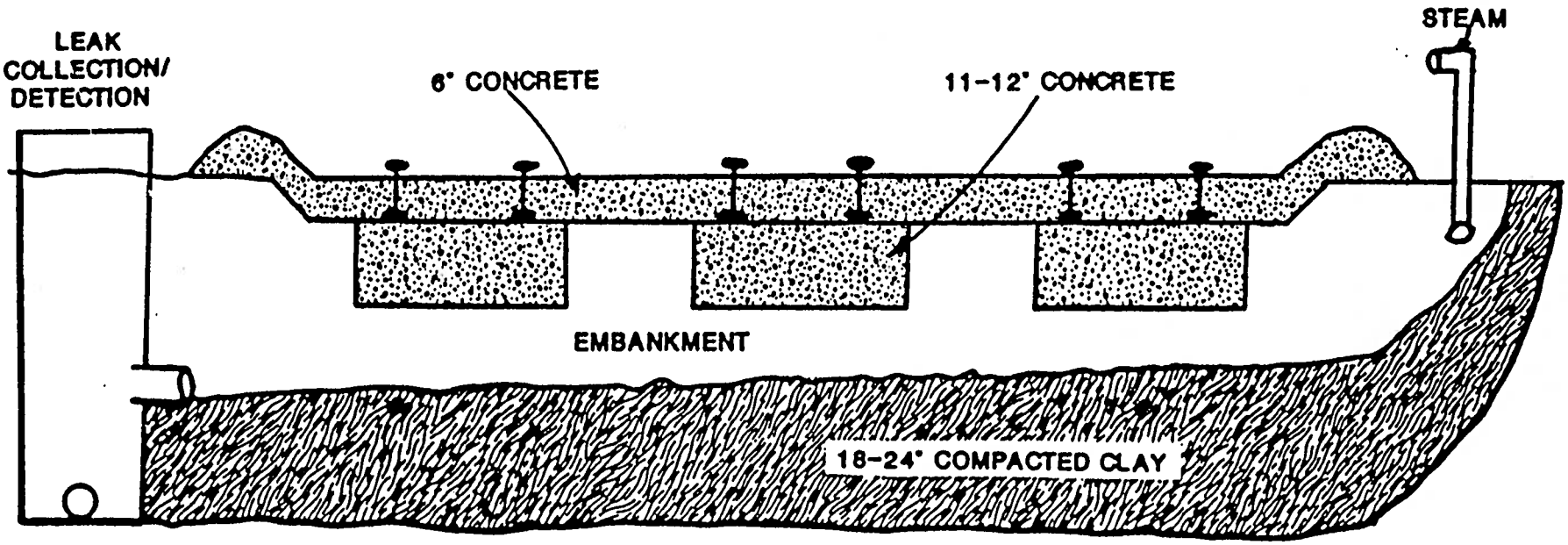


FIGURE 2-4: CROSS-SECTION OF A DRIP PAD

Waste Landfill in Emile, Alabama. All pipes were brought above ground and a concrete floor installed in the tank farm area. The existing concrete dikes remained for containment of any major spills.

As part of the tank farm project, a new overhead tank car unloading station was installed. This system utilizes the existing concrete pad for collection of any leaks. The overhead unloading system was purchased and installed to eliminate the potential for catastrophic spills associated with unloading a tank car from the bottom.

Waste Water/Stormwater Management

KMCC-FPD maintains a waste water pre-treatment discharge permit with the City of Columbus Department of Public Works. The permit allows KMCC-FPD to discharge process waters, and stormwater to the city sanitary sewer. Prior to upgrading the production process, KMCC-FPD discharged all process waters to the two impoundments which were located in the northwest corner of the facility. The impoundments served to remove excess preservative prior to discharging to the sanitary sewer. The upgrading of the production process oil recovery system allows KMCC-FPD to discharge process waters directly to the sewer without pretreatment. Contaminated groundwater from the remediation system will be recycled back to the production process oil/water separators to recover preservative and return preservatives to the production process creosote storage tanks.

Stormwater is collected from the process area including the drip pad and tank farm containment system. The stormwater collection system was upgraded in 1988. The project included the installation of a new collecting/pumping system and a storage tank. The storage tank serves as a surge/equalization system prior to discharging to the city sanitary sewer. The upgraded stormwater collection/equalization system replaced the Impoundments, which served a similar function.

Impoundments

Historically, the facility has maintained two waste water impoundments. The impoundments collected process waste water and the stormwater from the facility. Preservative was removed and recycled back to the facility prior to discharging the waters to the city sanitary sewer.

Impoundment 2 also served as a cooling water leg for a shell and tube barometric condensor.

KMCC-FPD submitted a closure plan to the Mississippi Bureau of Pollution control for the two impoundments. The closure plan called for the following steps to be undertaken:

* Pump all waste waters to sanitary sewer
* Recycle all recoverable preservative to production process
* Remove all visibly contaminated soils to a level of 3 inches below visible contamination
* Backfill and cap with low permeability clay
* Maintain post-closure care for thirty years

Active closure of the impoundments began in 1986. Closure was completed in 1987.

SECTION 3

POST-CLOSURE CARE PLAN

CLOSED SURFACE IMPOUNDMENTS

This section describes the Post-Closure Care Plan KMC LLC will follow for at least 30 years. Post-Closure Care has been provided since the spring of 1987 for the closed surface impoundments. Therefore, since this is the year 2000, 17 years remaining the post-closure care period. The plan is organized into nine areas: inspection and maintenance, security, preparedness and prevention, training, recordkeeping, Post-closure notes, groundwater monitoring, financial assurance and deed documentation.

The Post - Closure Care Plan will be implemented by the site hazardous waste coordinator, and the two alternate site hazardous waste coordinators. Table 3-1 presents a summary of the responsibilities of each position. The KMC LLC Hazardous Waste Program Coordinator will provide assistance to the plan whenever necessary. The Hazardous Waste Program Coordinator can be reached at: Kerr-McGee Chemical LLC, 123 Robert S. Kerr, Oklahoma City 73125, (405) 270 2402. One copy of the post-closure plan will be kept at the site, and one at the division headquarters office.

INSPECTION AND MAINTENANCE

The area containing the closed impoundments will be inspected for the following items:

- Erosion Damage: The impoundment cap and cover are designed to minimize erosion. They will be inspected for loss of gravel and rock, sloughing, growth of plants, and any other signs of disturbance. Clay, rock and gravel will be replaced, when necessary, and plant growth will be controlled with herbicides.

- Security Devices: The fence surrounding the impoundments and any locks on the fence, will be inspected for any breaks or signs of damage. All warning signs will be checked for legibility and evidence of damage.

- Run-on/runoff control system. The dome shaped cap of the impoundments is designed to act as run-on/run-off control. Pooling of water in any part of the impoundment cap will be used to indicate failure of this system, and will be remediated immediately.

- Groundwater Monitoring System. All monitoring wells will be inspected for the presence of a locked cap, integrity of the above-ground well casing, and the condition of the concrete collar at the base of the well casing.

Remedial action will be implemented within five days of any inspection which reveals areas requiring attention. The results of each inspection, and any related remedial maintenance will be recorded on the form presented in Table 3-2 . Table 3-3 indicates the frequency of the inspection.

TABLE 3-1

FACILITY HAZARDOUS WASTE COORDINATORS

SITE HAZARDOUS WASTE COORDINATOR

Principal hazardous waste coordinator, responsible for all plant operations with the authority to commit the resources needed to carryout the post-closure care plan, including inspection and maintenance, security, recordkeeping, and reporting.

FIRST ALTERNATE SITE HAZARDOUS WASTE COORDINATOR

Assistant to the Site Hazardous Waste Coordinator, with the authority to commit the resources needed to carryout the post-closure care plan in the absence of the principal hazardous waste coordinator.

SECOND ALTERNATE SITE HAZARDOUS WASTE COORDINATOR

Assists the Principal and First Alternate Coordinators in implementing the post-closure care plan.

Table 3-2
POST-CLOSURE CARE INSPECTION REPORT
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION
COLUMBUS, MISSISSIPPI

INSPECTION ITEM	CONDITION		MAINTENANCE PERFORMED
	GOOD	NEEDS ATTENTION (Describe)	
IMPOUNDMENT CAP AND COVER			
GRAVEL			
ROCK			
CLAY			
GROWTH OF PLANTS			
PRESENCE OF STANDING WATER			
SECURITY DEVICES			
FENCE			
LOCKS			
WARNING SIGNS			
GROUNDWATER MONITOR WELLS			
CAP			
CASING			
CONCRETE COLLAR			
LOCKS			

REMARKS:

_____

_____

_____

_____ _____ _____

SIGNATURE DATE TIME

TABLE 3-3

POST-CLOSURE INSPECTION AND MAINTENANCE SCHEDULE

ITEM	FREQUENCY
Inspection	
General Area	3 times/week
Groundwater Monitoring Wells	3 times/week
Security	3 times/week
Engineering Survey	Once/year
Significant Storm Events	As needed
Maintenance	
Erosion/ subsidence Backfill	As Necessary
Gravel Replacement	As Necessary
Remedial Maintenance	As Necessary

In addition to the routine inspections, an engineering site survey will be performed by an outside professional engineer whenever routine inspections indicate failure of the run-on/run-off control systems as evidenced by the pooling of water on the impoundment cap and cover. This engineer survey would primarily address the issue of subsidence, but the engineer will make a general inspection of the site as well, including addressing benchmark integrity.

SECURITY

The closure procedures were conducted such that they effectively isolated the facility workers and surrounding community from exposure to any potentially hazardous situation created by the closed facility. In addition, KMC LLC will maintain a locked fence around the closed impoundments to limit access to the area. Warning signs which advise people of all potential dangers in the closure area will be placed on the fence. In compliance with MHRMR 264.14 the signs read, "Danger, Unauthorized Personnel Keep Out".

PREPAREDNESS AND PREVENTION

In compliance with MHWMR 264 Subpart C, KMC LLC does maintain an Emergency Preparedness and Prevention Plan as well as an SPCC Plan. The plan does discuss and itemize that the facility is designed to minimize any potential of fire, explosion or unplanned sudden release of hazardous waste, and where necessary emergency equipment and locations. In the case of the closed surface Impoundments, there is no potential for fire or explosions, therefore no required equipment or alarm system.

TRAINING

As part of the KMC LLC Safety, Environmental and Health Program , all personnel exposed to potentially hazardous situations are trained annually in how to minimize there risk of those situations to human health. Also, all personnel with hazardous waste responsibilities are trained annually in this RCRA refresher course. The program is directed by a person trained in hazardous waste management procedures and instructs each employee on hazardous waste management responsibilities relevant to the position in which they are employed. The program includes hazardous materials management training, and post-closure care training. A record of attendees is kept along with their job titles.

All new employees engaged in these activities receive this training within the first 6 months of employment.

RECORDKEEPING

All records associated with the Post-Closure Care Program will be maintained at the plant site. These records will be available to the MissDEQ and EPA officials upon their request and verification of their identification. The retention period for all records given in Table 3-4. The site hazardous waste coordinators will be responsible for recordkeeping.

TABLE 3-4

RETENTION PERIOD FOR POST-CLOSURE CARE RECORDS

ITEM	RETENTION PERIOD
Inspection Records	3 years
General Maintenance Records	5 Years
Groundwater Monitoring Records	30 Years
Remedial Maintenance Records	10 Years

POST-CLOSURE NOTICES

KMC LLC has included the original Post-Closure Notices from 1987 in Appendix G. KMC LLC is prepared, if necessary, as per guidelines established by MHRMR 264.119(c) to ascertain certification as prescribed in MHWMR 264.120.

GROUNDWATER MONITORING

Corrective action has been implemented at the Kerr-McGee Chemical LLC's Columbus, Mississippi facility to reduce historical contamination and prevent migration of historical contamination. Corrective action is site-wide and extends off-site to the south and to a limited extent to the east of the process area. Two major sources of contamination have been identified as the process area and as the below ground level railroad car loading dock. No attempt has been made to distinguish the groundwater contamination from a RCRA regulated unit or a HSWA regulated SWMU, but, the site-wide groundwater corrective action is regulated as a whole under the facilities RCRA permit.

The groundwater at the facility is monitored in two separate aquifers: the shallow Alluvial Aquifer and a deeper aquifer in the Eutaw formation. There are forty three (43) monitor wells and twenty five (25) piezometers completed in the Alluvial Aquifer at the site. These monitoring wells range in depth from approximately seventeen (17) to thirty (30) feet below ground surface. Wells completed in the Alluvial Aquifer are located both on and off-site of the facility.

There are six (6) monitoring wells and one (1) piezometer located at the site which are completed in the Eutaw formation. These wells range in depth from approximately forty (40) to fifty-three (53) feet below ground surface.

In addition to the monitoring wells, fifty four (54) soil borings have been drilled at the site.

The Corrective Action System consists of eleven (11) groundwater recovery wells and two recovery trenches. The recovery wells are completed in the Alluvial Aquifer. Five of the wells are located along the facility boundary south of the process area, one well is located west (upgradient) of the process area, two wells are located adjacent to the diesel storage tanks, one well is located upgradient of the below ground tie loading dock and two wells are located along the eastern edge of the facility boundary. The Corrective Action Plan is in Appendix H.

The recovery trenches are approximately 20 feet deep with the base of the trench being at the top of the Eutaw formation. One trench is located to the south of the facility outside the facility property boundary. The other trench is located downgradient of the below tie loading dock.

The following are recommended as the groundwater monitoring system:

Compliance Monitoring Wells: CMW-6, CMW-7 and CMW-8 are recommended as compliance wells.

Upgradient Monitoring Well: CMW-1AR is recommended as the upgreadient well.

Boundary control Wells: Monitoring wells CMW-14, CMW-16, CMW-26, CMW-28, CMW-29,CMW-30, CMW-51, CMW- 56, CMW-57, CMW-60, and CMW-65 are recommended as boundary control wells and shall be used to monitor the possibility of plume migration.

Deep Monitoring Wells: CME-3, CME-5, CME-6, CME-7, and CME-8 are recommended as the deep monitoring wells.

Effectiveness Wells: CMW-3, CMW-11, CMW-19, CMW-24, CMW-27, CMW-61, and CMW-66 are recommended as effective wells used to monitor the effectiveness of the corrective action program.

DNAPL Wells: DNAPL wells are wells that contain a measurable thickness of free phase creosote constituents.

The following hazardous constituents and their concentration limits are recommended to comprise the groundwater protection standard.

TABLE 3-5 Groundwater Protection Standards

ANALYTES	HAZARDOUS CONSTITUENTS	CONCENTRATION LIMITS	ANALYTICAL METHOD
KOO1 APPENDIX VII ACID COMPOUNDS	2-Chlorophenol	MDL	3520/8270
	2,4-Dimethylphenol	MDL	3520/8270
	2,4 dinitrophenol	MDL	3520/8270
	p-Cloro-m-cresol	MDL	3520/8270
	Pentachlorophenol	MDL	3520/8270
	Phenol	MDL	3520/8270
	2,4,6-Trichlorophenol	MDL	3520/8270
	2,3,4,6-Tetrachloro-phenol	MDL	3520/8270
K001 BASE COMPOUNDS	Acnephthylene	MDL	3520/8270
	Benzo(a)pyrene	MDL	3520/8270
	Flouranthene	MDL	3520/8270
	Naphthalene	MDL	3520/8270
	Carbazole	MDL	3520/8270
	Benzo(a)anthracene	MDL	3520/8270
	Benzo(b)fluoranthene	MDL	3520/8270
	Indeno(1,2,3-c,d)pyrene	MDL	3520/8270
	Phenanthrene	MDL	3520/8270
	Dibenzo(a,h)anthrace ne	MDL	3520/8270
Volatiles	Benzene	MDL	602/8020
	Total Xylene	MDL	602/8020
	Total Phenols	MDL	602/8020

MDL is the Method Detection Limit

All compliance wells, boundary control wells, and deep monitoring wells are recommended to be sampled semi-annually for groundwater protection standards listed in Table 3-5.

The upgradient well is recommended to be sampled annually for the groundwater protection standards.

Effectiveness wells shall be sampled semi-annually for total phenol, napthalene, and acenapthylene and biennially for the groundwater protection parameters list in Table 3-5.

One effectiveness well will be sampled annually for Appendix IX parameters less the list itemized in the previous permit modification from 1997 (See Attachment III). If additional Appendix IX parameters are found KMC LLC will resample the well within 30 days. If the second analysis confirms the presence of new constituents KMC LLC will report the additional constituents along with their concentrations to the Executive Director within 10 days of receipt of the analysis report and add them to the monitoring list.

Wells that indicate constituent concentrations below the Method Detection Limit will not be considered impacted.

Product thicknesses shall be measured semi-annually in all DNAPL wells.

Sampling and Analysis Procedures

The Sampling and Analysis Plan is contained in Appendix. J

Samples will be collected by the techniques described in the "Sampling and Analysis Plan, Kerr-McGee Chemical LLC, Forest Products Division, Columbus, Mississippi as revised May 31, 1996.

Samples will be shipped and preserved in accordance with the procedures specified in the "Sampling and Analysis Plan, Kerr-McGee Chemical LLC, Forest Products Division, Columbus, Mississippi as revised May 31, 1996.

Samples shall be tracked and controlled using the chain of custody procedures specified in the "Sampling and Analysis Plan, Kerr-McGee Chemical LLC, Forest Products Division, Columbus, Mississippi as revised May 31, 1996.

FINANCIAL ASSURANCE

KMC LLC has projected the annual cost of $ 6790.32. A breakdown of the total cost estimate is given in Table 3-6. Post closure care was initiated in the spring of 1986. Consequently, a 16 year cost estimate of $153,011.41 is provided in lieu of a 30 year cost estimate. The current Financial Assurance is included in Appendix K.

Corrective Action financial assurance is also provided in Appendix K.

DEED DOCUMENTATION

KMC LLC provided deed documentation of the location of the closed hazardous waste management units in the original Post-Closure Permit Application dated March 13, 1987. This information has not changed.

TABLE 3-6

POST-CLOSURE CARE COST ESTIMATE

Summary of Post-closure Costs

1) Annual Maintenance and Inspection of the Cover	$ 1,300
2) Annual Sampling and Analysis of Compliance Wells	$ 4,627.74
3) Annual Sampling and Analysis of Background Well	$ 862.58
4) Total Annual Costs	$6,790.32
5) Number of years remaining in Post-Closure Period (July 2016 - April 2000)	16
Subtotal of annualized Post-closure costs	$108,645.12
Engineering Expenses 10%	$ 10,864.51
Deed Notification	$3,000.00
Certification of Completion of Post-closure	$5,000.00
Subtotal	$127,509.51
Contingency (20%)	$25,501.90
Total cost of Post-closure Care	**$153,011.41**

or his designee or authorized representative.

I.D.1. Hazardous constituents for purposes of this permit are those substances listed in MHWMR 261, Appendix VIII and include hazardous constituents released from solid waste and hazardous constituents that are reaction by-products.

I.D.2. Release for purposes of this permit includes spilling, leaking, pumping, pouring, emitting, emptying, discharging, injection, escaping, leaching, or disposing into the environment of any hazardous waste or hazardous constituents, but excludes those otherwise authorized under law.

I.D.3. Appendix IX Parameters for the purpose of this permit shall mean the constituents listed in MHWMR 264 Appendix IX less the following constituents:

Common Name	CASRN	Common Name	CASRN
Aldrin	309-00-2	Endosulfan II	33213-65-9
Antimony	(Total)	Endosulfan sulfate	1031-07-8
Barium	(Total)	Endrin	72-20-8
Beryllium	(Total)	Endrin aldehyde	7421-93-4
alpha-BHC	319-84-6	Heptachlor	76-44-8
beta-BHC	319-85-7	Heptachlor epoxide	1024-57-3
delta-BHC	319-86-8	Mercury	(Total)
gamma-BHC	58-89-9	Methoxychlor	72-43-5
Cadmium	(Total)	Nickel	(Total)
Chlordane	57-74-9	Polychlorinated biphenyls	
Cobalt	(Total)	Selenium	(Total)
Copper	(Total)	Silver	(Total)
Cyanide	57-12-5	Silvex	93-72-1
2,4-D	94-57-7	Sulfide	18496-25-8
4,4'-DDD	72-54-8	2,4,5-T	93-76-5
4,4'-DDE	72-55-9	Thallium	(Total)
4,4'-DDT	50-29-3	Tin	(Total)
trans-1,2-Dichloroethylene	156-60-5	Toxaphene	8001-35-2
Dieldrin	60-57-1	Vanadium	(Total)
Endosulfan I	959-98-8	Zinc	(Total)

I.E. DUTIES AND REQUIREMENTS

I.E.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an Emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an Emergency Permit, constitutes a violation of RCRA and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. [MHWMR 270.30(a)]

I.E.2. Duty to Reapply

If the Permittee wishes to continue an activity allowed by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to Permit expiration. [MHWMR 270.10(h), 270.30(b)]

SECTION 4

SITE HYDROGEOLOGY

Section 4 presents a detailed discussion of the site hydrogeology, the groundwater monitoring system, and the most recent groundwater monitoring data.

Attachment IV contains a detailed discussion of the Area Geologic Setting.

Appendix L contains the most recent Semi-Annual Groundwater Monitoring Report (March 1, 2000). This report contains the most recent potentiometric maps and groundwater analysis reports.

SITE CLIMATOLOGY

The climate of the Columbus area is characterized by long hot summers, due to moist tropical air from the Gulf of Mexico persistently covering the area. Winters are usually cool and fairly short, with only a rare cold wave that moderates in one or two days. Precipitation is fairly heavy thought the year, peaking slightly in winter and occurring as thunderstorms during the summer. Prolonged droughts are rare in Columbus.

Table 4-1 shows the yearly precipitation data for Columbus from 1951 to 1998, obtained from the National Oceanic and Atmospheric Administration Cooperative Station 22-1870 and the University of Mississippi. These data show the average annual precipitation to be 57.14 inches for the recorded period of time. Figure 4-1 graphically depicts precipitation totals on a yearly basis for 1951 to 1998.

Table 4-2 shows wind data obtained from the U.S. Air Force Weather Service for the period of 1984 through 1992. These data graphically depicted in figure 4-2 as a wind rose showing both predominant wind direction and speeds.

FIGURE 4.1

Annual Precipitation
1951-1998
Columbus Luxapallila Station

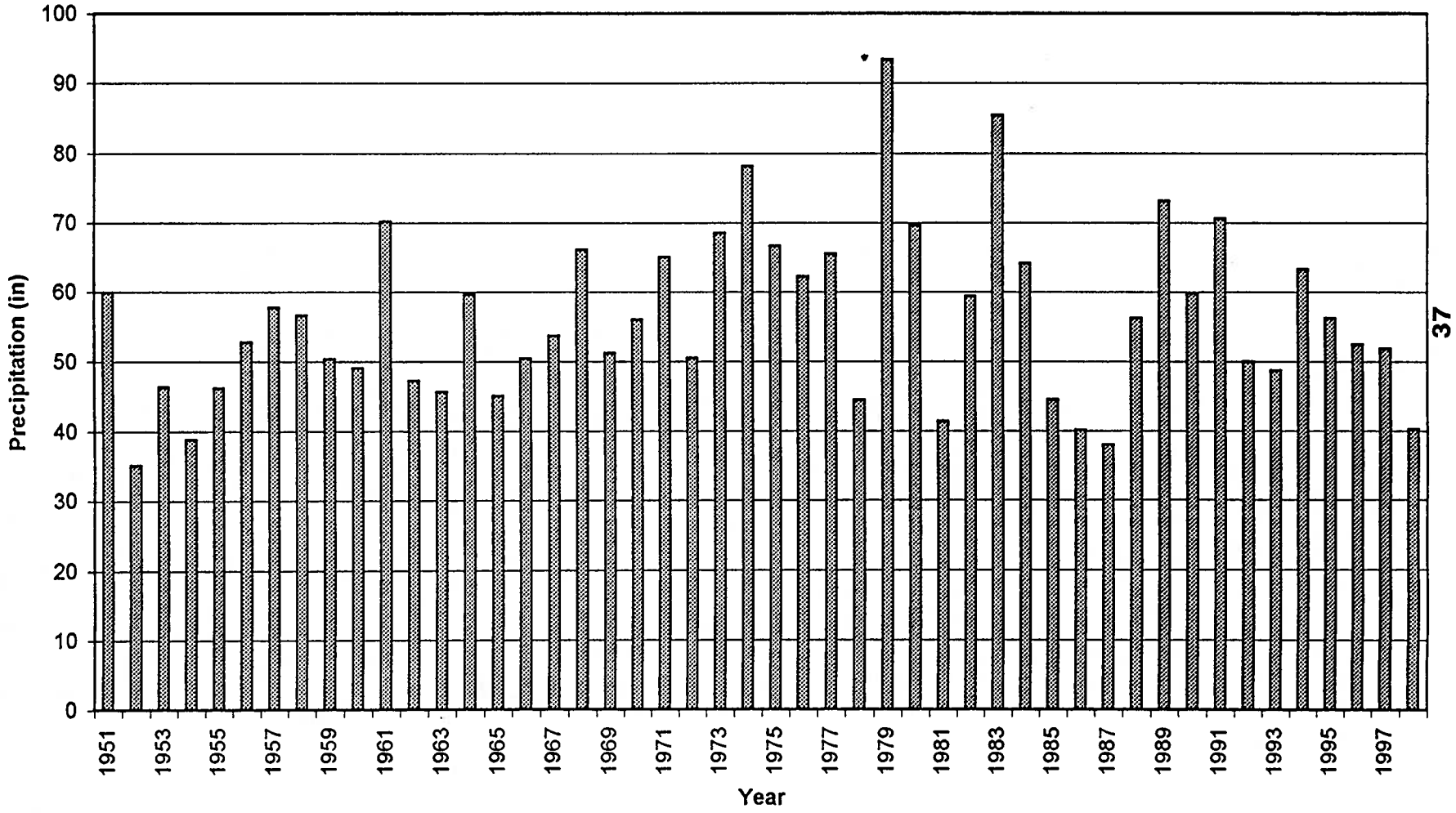


TABLE 4-1

Station: **COLUMBUS LUXAPALLILA**
Parameter: Precipitation
Year: 1981-1998
State: MISSISSIPPI
County: LOWNDES

ID: 1880
Statistic: Sum
Latitude: 33:28:00
Longitude: 088:23:00
Elevation: 145.00

Monthly Data: Total

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Min	Max
1981											1.61	3.74	5.35	1.61	3.74
1982	8.62	5.90	1.80	10.31	2.46	5.23	4.36	1.46	1.26	4.77	5.80	7.42	59.39	1.26	10.31
1983	5.14	10.78	7.20	10.39	11.64	6.04	2.43	0.890	6.30	2.97	6.88	14.78	85.44	0.890	14.78
1984	4.37	4.99	4.85	10.34	5.65	6.89	4.76	4.88	0.500	6.86	7.48	2.59	64.16	0.500	10.34
1985	4.24	5.09	1.98	4.30	1.88	5.40	2.61	4.75	2.88	6.68	0.880	3.75	44.44	0.880	6.68
1986	0.840	1.89	3.96	0.510	4.38	1.39	2.26	5.34	3.14	5.85	6.59	4.01	40.16	0.510	6.59
1987	4.66	7.01	3.71	1.03	3.03	3.63	1.72	2.84	2.73	0.120	4.05	3.48	38.01	0.120	7.01
1988	4.38	4.37	3.38	3.24	3.34	0.030	5.81	5.86	7.23	6.84	8.34	3.46	56.28	0.030	8.34
1989	7.90	7.45	4.87	3.22	8.22	11.95	5.96	4.09	6.96	1.65	6.33	4.58	73.18	1.65	11.95
1990	8.68	9.96	7.08	2.28	5.95	4.23	0.810	0.230	1.43	1.69	4.31	13.26	59.91	0.230	13.26
91	2.71	8.74	7.60	12.73	11.29	3.39	2.18	7.32	3.98	3.17	3.19	4.31	70.61	2.18	12.73
	3.66	4.42	3.51	3.33	0.790	4.74	6.78	4.97	2.61	1.97	7.91	5.27	49.96	0.790	7.91
199	5.75	3.93	4.22	2.51	7.06	5.31	1.89	2.89	4.00	3.30	4.78	3.04	48.68	1.89	7.06
1994	5.93	5.24	8.30	3.06	3.11	9.10	10.00	1.07	4.11	4.50	3.64	5.28	63.34	1.07	10.00
1995	4.79	4.46	5.16	9.46	2.14	2.72	5.77	5.49	3.33	4.50	3.95	4.56	56.33	2.14	9.46
1996	6.93	2.10	6.15	4.77	1.04	4.51	6.94	4.76	3.77	1.76	5.47	4.28	52.48	1.04	6.94
1997	7.31		3.24	4.21	5.34	7.61	2.91	2.23	3.01	6.52	4.15	5.35	51.88	2.23	7.61
1998	7.76	5.53	3.22	4.96	2.32	1.67	10.87	3.05	0.330	0.520			40.23	0.330	10.87

Station ID : 93862
Years : 84 85 86 87 88 89 90 91 92
Start Date : January 1
Start Time : Midnight

RUN ID : TUPELO

End Date : December 31
End Time : 11 PM

Frequency Distribution
(Count)

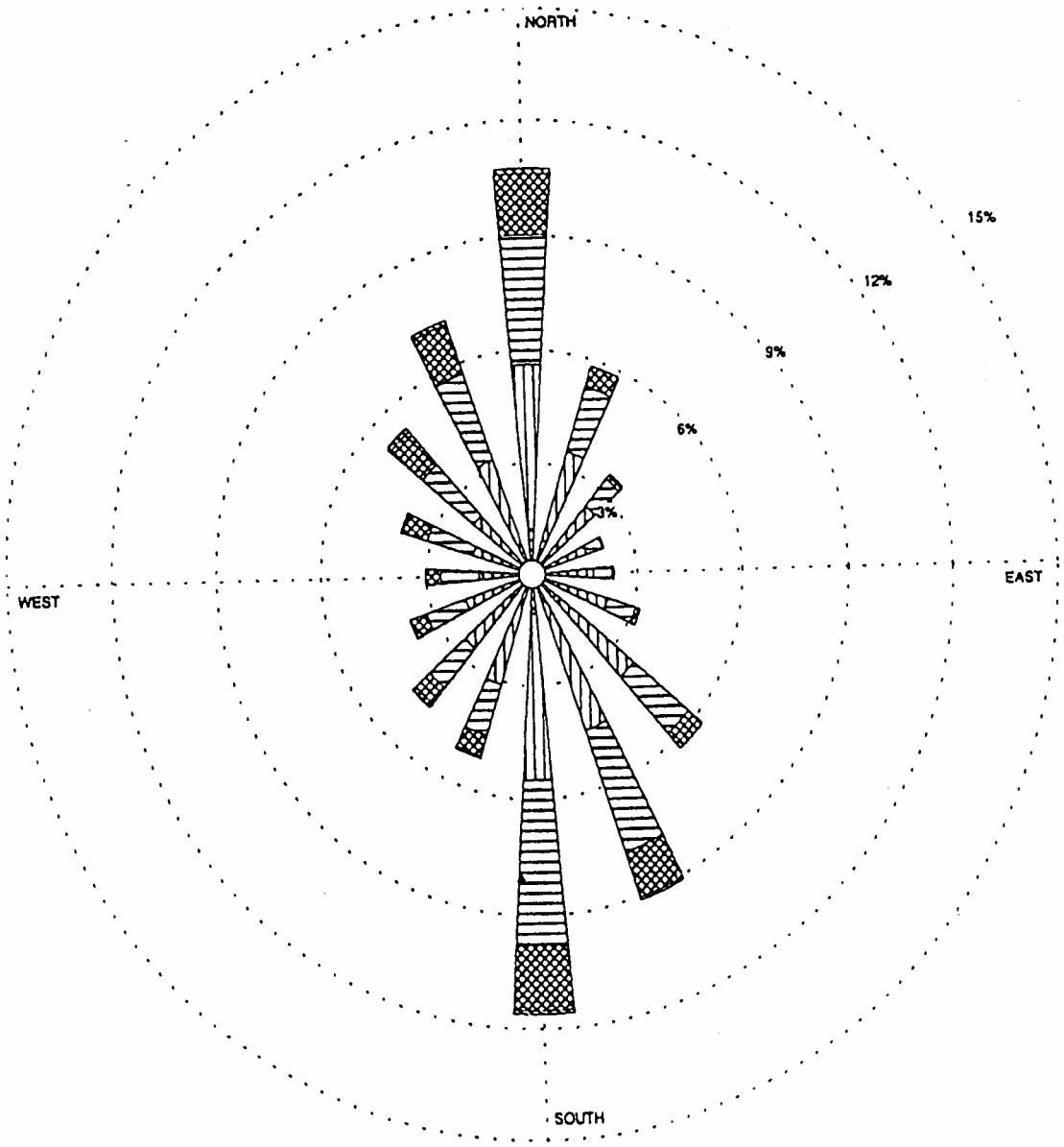
Wind Direction (Blowing From) / Wind Speed (Knots)

	1 - 3	4 - 6	7 - 10	11 - 16	17 - 21	> 21	Total
N	986	3464	2686	1290	102	2	8530
NNE	771	1959	1447	438	13	1	4629
NE	569	1332	737	151	4	2	2795
ENE	444	861	380	54	2	0	1741
E	419	959	421	58	3	0	1860
ESE	492	1280	654	122	3	0	2551
SE	683	2255	1601	415	13	1	4968
SSE	660	2852	2672	994	51	3	7232
S	853	3483	3395	1365	94	10	9200
SSW	628	1813	1124	464	41	7	4077
SW	594	1457	1066	516	32	4	3669
WSW	412	1196	929	382	41	5	2965
W	279	932	856	333	32	3	2435
WNW	318	1080	1071	581	54	8	3112
NW	394	1305	1465	937	95	13	4209
NNW	515	2080	1933	1079	103	8	5718
Total	9017	28308	22437	9179	683	67	78912

Frequency of Calm Winds : 9221
Average Wind Speed : 6.92 Knots

WIND ROSE PLOT

STATION #93862 - TUPELO, MS



SRCC
254 Howe-Russell
Louisiana State Univ.
Baton Rouge, La 70802

PLOT YEAR-DATE-TIME
84 85 86 87 88 89 90 91 92
January 1 - December 31
Midnight - 11 PM

ORIENTATION
Direction (blowing from)

DISPLAY
Wind Speed

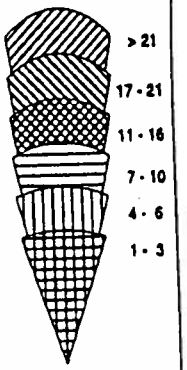
UNIT
Knots

CALM WINDS
11.69%

AVG. WIND SPEED
6.92 Knots

DATE
3/3/99

Wind Speed (Knots)



MODELER
Southern Regional Climate Center

Anemometer Ht. - 25' to 8/1/85, 30' after

PROJECT

Tupelo 1984 - 1992

WRPLOT View 1.3 by Lakes Environmental Software - www.lakes-environmental.com

FIGURE 4-2

TABLE 4-2

Station ID : 93862
Years : 84 85 86 87 88 89 90 91 92
Start Date : January 1
Start Time : Midnight

RUN ID : TUPELO

End Date : December 31
End Time : 11 PM

Frequency Distribution
(Normalized)

Wind Direction (Blowing From) / Wind Speed (Knots)

	1 - 3	4 - 6	7 - 10	11 - 16	17 - 21	> 21	Total
N	0.012495	0.043897	0.034038	0.016347	0.001293	0.000025	0.108095
NNE	0.009770	0.024825	0.018337	0.005550	0.000165	0.000013	0.058660
NE	0.007211	0.016880	0.009340	0.001914	0.000051	0.000025	0.035419
ENE	0.005627	0.010911	0.004815	0.000684	0.000025	0.000000	0.022063
E	0.005310	0.012153	0.005335	0.000735	0.000038	0.000000	0.023571
ESE	0.006235	0.016221	0.008288	0.001546	0.000038	0.000000	0.032327
SE	0.008655	0.028576	0.020288	0.005259	0.000165	0.000013	0.062956
SSE	0.008364	0.036142	0.033861	0.012596	0.000646	0.000038	0.091646
S	0.010810	0.044138	0.043023	0.017298	0.001191	0.000127	0.116586
SSW	0.007958	0.022975	0.014244	0.005880	0.000520	0.000089	0.051665
SW	0.007527	0.018464	0.013509	0.006539	0.000406	0.000051	0.046495
WSW	0.005221	0.015156	0.011773	0.004841	0.000520	0.000063	0.037573
W	0.003536	0.011811	0.010848	0.004220	0.000406	0.000038	0.030857
WNW	0.004030	0.013686	0.013572	0.007363	0.000684	0.000101	0.039436
NW	0.004993	0.016537	0.018565	0.011874	0.001204	0.000165	0.053338
NNW	0.006526	0.026358	0.024496	0.013673	0.001305	0.000101	0.072460
Total	0.114267	0.358729	0.284329	0.116319	0.008655	0.000849	

Frequency of Calm Winds : 11.69%
Average Wind Speed : 6.92 Knots

SITE HYDROGEOLOGY

Section 4 presents a detailed discussion of the site hydrogeology, the existing groundwater monitoring system, and the groundwater monitoring data.

AREA GEOLOGIC SETTING

The area surrounding the Columbus Facility is on the eastern edge of the Mississippi embayment, a broad inlet arm of the Gulf Coastal Plain. Regional topographic expressions have been modified by erosional and depositional processes. A detailed lithologic log describing type sections for alluvial sediments and the underlying Eutaw and McShan formations for the Columbus facility is provided in Table 5-1.

Underlying the entire plant site are Quaternary age alluvial deposits consisting of gravel, sand, silt and clay. Generally, the gravel occurs at the base of the alluvium and grades upward into sands and silts. Well records indicate the thickness of the alluvium to be about 25 feet in the area of the Kerr-McGee facility.

The Eutaw formation underlies the alluvial deposits. The Eutaw is typically composed of two members, the uppermost being the Tombigbee Sand Member and the lower member remaining yet unnamed but commonly referred to as "typical" Eutaw. The Tombigbee Sand Member is a fine-to-medium grained, glauconitic, calcareous, massive sand. The lower "typical" Eutaw is less glauconitic sand with a slightly coarser texture than the overlying Tombigbee. Clay layers with associated lignite and plant fossils can be found in the "typical" Eutaw. Cross-bedding is common. The Eutaw formation, on a regional basis, is up to 500 feet thick and at an approximate

TABLE 5-1

LITHOLOGIC DESCRIPTION FOR THE STRATIGRAPHIC UNITS
UNDERLYING THE COLUMBUS, MS FACILITY

Era	System	Series	Group	Stratigraphic Unit	Thickness (FT)	Lithologic Description
Cenezoic	Quaternary	Pleistocene to Recent		Alluvium	0-60 Approx. 25 at Facility	Clay, silt, sand, and gravel. Basal part generally has the coarser material. Occurs as alluvial fill in the flood plains of the Tombigbee River and its larger tributaries.
				Terrace Deposits	0-50 Not present at facility	Clay, silt, sand & gravel. Basal part generally has the coarser material. Deposits forming terraces cover extensive areas along the eastern side of the Tombigbee River & small areas on the western side.
Mesozoic	Cretaceous	Upper Cretaceous		Eutaw Formation * (including Tombigbee Sand Member)	240	Sand with clay & shale lenses. Tombigbee Sand Member forms the upper half (120 feet) of the Eutaw formation. The Tombigbee is fine-to-medium-grained, highly glauconitic, calcareous and massive sand, but may include shale and bentonic clay. Beds of sand in the lower half of the Eutaw generally have slightly coarser sand & less glauconite than sand beds in the upper half. The ratio of clay & shale to sand may vary widely within short distances. The Eutaw crops out along & mostly east of the Tombigbee River and dips to the southwest. *The Tombigbee Sand Member is not present at the Columbus Facility.
				McShan Formation	100-150	Clay and sand with a few thin beds of gravel in the lower part of the formation. Clay is mostly gray and may be lignitic. Sand beds are variable in thickness and in grain size. McShan underlies the four counties except for a small area in northeastern Monroe County.

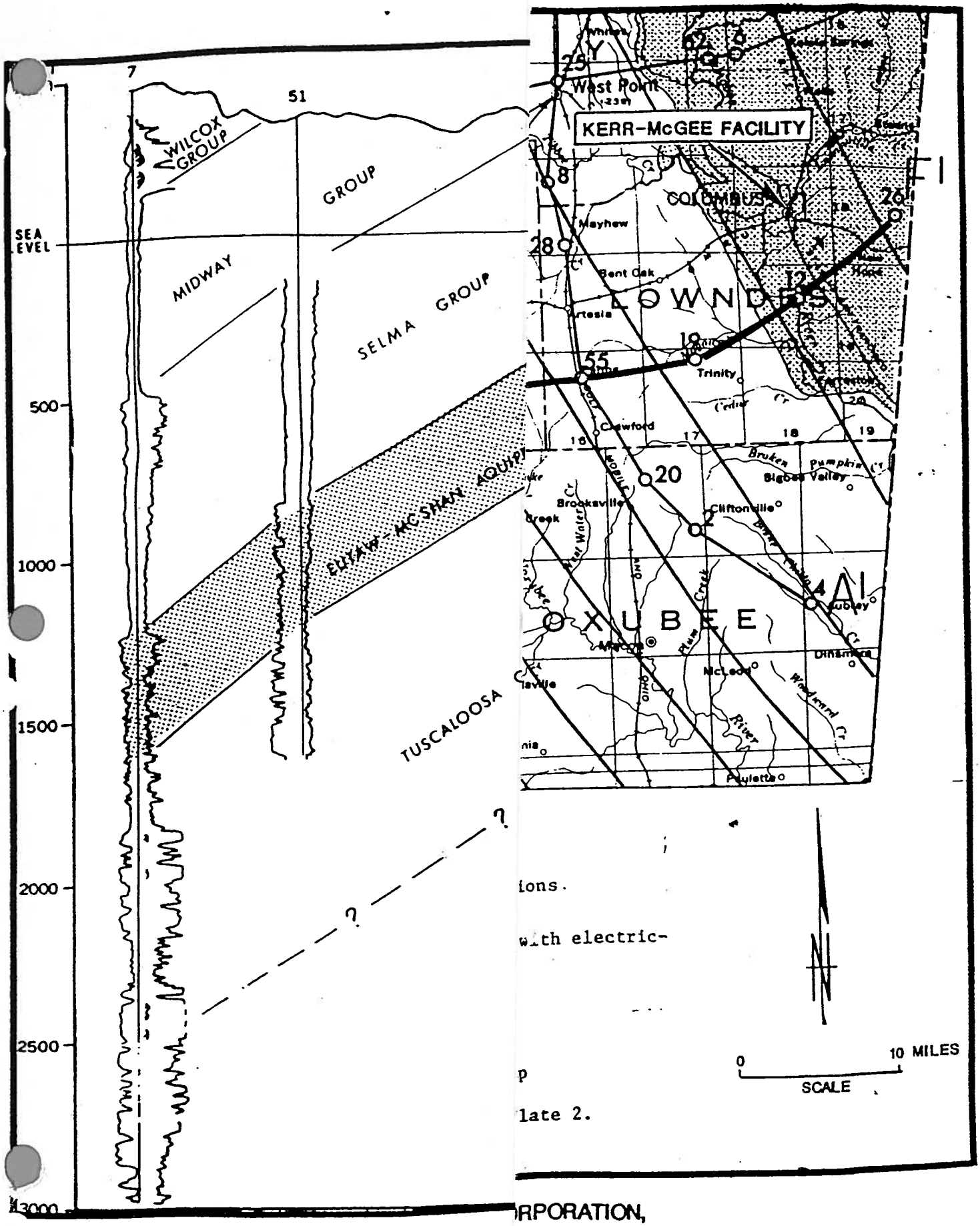
depth of 200 feet and greater, has served as a major aquifer and source of industrial and domestic water. In the area of the Columbus facility, the Eutaw is composed of finer grained material and appears to be less permeable.

The McShan formation underlies the Eutaw formation and is comprised of clay and sand, with a few beds of gravel in the lower part. Scott (1965) reports the sands to be somewhat glauconitic, although less than that of the Eutaw. Sand beds vary in thickness and grain size. The formation is approximately 200 feet thick in the Columbus area and is a major regional aquifer. A representative cross-section of the geologic conditions underlying the area is presented in Figure 5-1.

SITE GEOLOGIC SETTING

Two distinct soil series are recognized near the closed impoundment at the Columbus facility. They are classified as the Prentiss-Urban land complex (Pw) and the Rosella silt loam (Ro), and are described in Soil Survey of the Lowndes County, Mississippi (September, 1979).

The Prentiss-Urban land complex (Pw) consists of moderately well drained soils in the City of Columbus and on Columbus Air Force Base. The soils of this complex exist in an intricate pattern with cuts and fills for residential buildings, streets, utilities, and other public facilities. Much of the original soil profile has been so extensively altered that the soil series would be difficult to identify at the facility. The moderately well drained Prentiss soils typically have a surface layer of dark loam about seven inches thick. The upper part of the subsoil, to a depth of 26 inches, is yellowish brown loam. The lower part, to a depth of 73 inches, is a fragipan of sandy loam and loam mottled in shades of brown, gray, and red.



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p

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RPORATION,

FIGURE 4 -1 F

F

Prentiss soils are strongly acid or very strongly acid. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is medium. Run-off is slow to medium, and the erosion hazard is slight or nonexistent.

The Rosella silt loam (Ro) is a poorly drained soil on broad flats and in depressions. Slopes range from 0 to 2 percent. Typically, the surface layer is a grayish brown, silty loam about 10 inches thick. The upper part of the subsoil, to a depth of 22 inches, is grayish brown loam that has yellowish brown mottles and tongues of light gray, very fine sand. The middle part, to a depth of 63 inches, is gray loam mottled in shades of brown. The lower part, to a depth of 80 inches, is light gray loam mottled in shades of brown and red.
The soil is strongly acid or very strongly acid. Permeability is slow, and available water capacity is high. Runoff is slow, and the erosion hazard is slight.

The Upper Cretaceous Eutaw formation represents the first confining layer at the site. The upper erosional surface of this stratigraphic unit is found at relatively shallow depths (25 feet) at the facility, and may be considered the first truly consolidated formation underlying the sand and gravel sequence of the alluvium. At the Columbus facility, the Tombigbee Sand Member appears to have been eroded away.

The Columbus facility, located approximately one mile west of the Luxapalila Creek, is located in the Upper Tombigbee River Basin. A topographic (See Appendix B) map shows the facility location in relation to the Creek.

The map shows a topographic high ridge west of the facility which represents a surface water divide and due to this feature, the local discharge point is the Luxapalila Creek to the east.

AQUIFERS

Three distinct aquifers underlie the plant site: the upper most alluvial aquifer, and the Eutaw and McShan aquifers. The upper most alluvial aquifer, underlain by the Eutaw formation, represents the first susceptible zone to be impacted by any potential contamination. The alluvial material deposited by Luxapalila Creek consists of interbedded layers of clay, silt, sand, and gravel that is generally coarser with depth. Hydraulic conductivity of some sections of the alluvium is reported (Wasson et al, 1965) as being high, anywhere from 200 to 2000 gpd/ft^2. The saturated zone is generally about 20 feet thick and is subject to seasonal fluctuations. Luxapalila Creek cuts the entire thickness of the alluvium and tends to recharge or drain the alluvial "aquifer", depending on the season and flow stage of the creek. Recharge to the alluvium also occurs as rainwater percolating through the overlying material. Water obtained from the alluvium has an average temperature of 65^{o}F, is low in dissolved solids and is soft to moderately hard. The pH is generally low (less than 7.0), and iron is generally objectionable (unpalatable).

The Upper Cretaceous Eutaw and McShan aquifers are important sources of both industrial and domestic water supplies on a regional basis. Both formations crop out in the Columbus area, to which recharge of these aquifer systems occur (Wasson et al, 1965). During the dry summer months, when the water table is low, both formations receive some recharge from Luxapalila Creek.

Water from the Eutaw formation is generally a calcium-bicarbonate type containing small amounts of dissolved solids, with a pH of usually less than 7.5. As water moves downdip in formation, it becomes more mineralized and obtains a high pH.

SECTION 5

ENGINEERING FEASIBILITY STUDY

The on-site assessment and characterization at the Columbus facility has been completed through the HSWA permit. The facility has characterized all SWMUs on-site and has delineated the horizontal and vertical extent of free product and dissolved wood preservative constituents on-site. In 1992 a recovery system designed for recovering free product and contaminated groundwater was constructed and implemented south of the production process area. The purpose of this recovery project was to initiate interim corrective measures south of the production process area. KMC LLC eliminated on-going sources of contamination through source removal of impoundments, tank farms and the drip track. KMC LLC, through the environmental management program is preventing future releases to the environment by product process modifications, secondary containment in tank farms, concrete drip pads and creosote product recovery. The Columbus facility is also an ISO 14000 site attaining the certification for having an environmental management system.

CORRECTIVE ACTION GOALS AND OBJECTIVES

Implementation of the recovery project mitigated and minimizes threats to and provides protection of public health and the environment during interim corrective action period. Remedial alternatives for corrective action evaluated to meet this goal were abased on:

Performance - Corrective measurements most effective at performing their intended functions and maintaining the performance over extended periods of time.

Reliability - Corrective measures which do not require frequent or complex operation and maintenance activities and that have proven effective under similar situations at other KMC LLC facilities.

Implementability - Corrective measures which can be constructed and operated to reduce the levels of contamination to attain the applicable standard in the shortest period of time.

Safety - Corrective measurements which pose the least threat to the safety of nearby residents and environments as well as workers during implementation.

Human Health - Corrective measures must comply with existing US EPA criteria, standards or guidelines for the protection of human health. Corrective measurements which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time.

Environmental - Corrective measures that pose the greatest improvement over a reasonable time on the environment.

Corrective actions were initiated as interim measures to prevent any migration off-site and to cleanup any contamination on-site.

A detailed discussion of the corrective action program is provided in the 1999 Groundwater Monitoring and Effectiveness Report, which is included as an Appendix L to this application.

Future corrective actions will be implemented based on the RFI investigation conducted in compliance with the HSWA permit .

Post-Closure Permit Completeness Checklist

Section A - General Information

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
A-1	General Description A general description of the facility. Include the nature of the business. Off-site facilities should identify the types of industry served; on-site facilities should briefly describe the process(es) involved in the generation of hazardous waste.	270.14(b)(1) Guidance	SECTION 2	4-260.04(a)(1) 4-260.04
A-2	Topographic Map A topographic map showing the facility and a distance of 1000 feet around it. The following information is required: • Scale 1 in ≤200 ft. • Contours sufficient to show surface water flow • Extend 1000 ft beyond property • Map scale • Map date • 100-yr floodplain • Surface waters • Surrounding land use • Wind rose • Map orientation • Legal boundaries • Location of access control • Injection and withdrawal wells - on-site - off-site • Buildings • Structures • Sewers • Loading and unloading areas • Fire control facilities • Flood control or drainage barriers • Run-off control systems • Location of hazardous waste units • Access and internal roads For large facilities the use of other scales may be acceptable on a case-by-case basis. (Although many of these items can be shown on a single map, it is allowable to use additional maps to display some of the information. Presentation of all of this information on a single map may sacrifice clarity.)	270.14(b)(19)	APPENDIX D	4-260.04(a)(20)
	Additional Topographic Requirements for Land Storage, Treatment and Disposal Facilities (See Section C-3 - Topographic Map Requirements.)	270.14(c)(3) & (4)		4-260.04(c)(3) & (4)
A-3	Location Information	270.14(b)(11)	SECTION 2	4-260.04(a)(11) & (12)
A-3a	Floodplain Standards Documentation of whether or not the facility is located within a 100-yr floodplain including the source of data (Federal Insurance Administration Map or other maps and calculations). If map other than FIA map is used, demonstration of equivalent mapping technique should be provided. If located in 100-yr floodplain include:	270.14(b)(11)(iii) 264.18(b)	APPENDIX C	4-260.04(a)(11) 4-255.07

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• 100-yr floodplain level • Other special flooding factors (e.g., wave action) that must be considered to prevent washout			
A-3a(1)	Demonstration of Compliance For facilities located within the 100-yr floodplain, a description of how the facility is designed, constructed, operated, and maintained to prevent washout of any hazardous waste during a flood. Either of the following may be used:	270.14(b)(11)(iv) 264.18(b)	NA	4-260.04(a)(12) 4-255.07
A-3a(a)(a)	Flood Proofing and Flood Protection A structural or other engineering study showing how design of the tanks, containers, or waste piles and the flood proofing and protection devices at the facility will prevent washout including: • Engineering and analysis of hydrodynamic and hydrostatic forces • Structural or other engineering studies of hazardous waste units and flood protection devices	270.14(b)(11)(iv)(A) and (B)		4-260.04(a)(12)(aa) & (bb)
A-3a(1)(b)	Flood Plan Description of the procedures to be followed to remove hazardous waste to safety before the facility is flooded. The plan must address the following: • Timing related to flood levels • Estimated tme to move the waste • Description of the location to which the waste will be moved and proof of the receiving facility's eligibility to receive hazardous waste • Procedures, equipment, and personnel to be used and the means to ensure that these resources will be available • Potential for accidental discharge of the waste	270.14(b)(11)(iv)(C)		4-260.04(a)(12)(c)
A-3a(2)	Plan for Future Compliance with Floodplain Standard For facilities located within the 100-yr floodplain that do not comply with the floodplain standard, a plan showing how and when the facility will be brought into compliance. A compliance schedule must be included.	270.14(b)(11)(v)		4-260.04(a)(12)(d)
A-3a(3)	Waiver for Land Storage and Disposal Facilities (Existing Facilities Only) If a waiver from the Floodplain Standard is requested, the owner or operator must demonstrate that there will be no adverse effects on human health or the environment if washout occurs. The following factors must be considered in this demonstration: • Volume and physical and chemical characteristics of the waste • Concentration of hazardous constituents that would potentially affect surface waters	264.18(b)(ii)		4-255.07(1)(b)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Impact of such concentrations on the current or or potential uses of and water quality standards established for the affected surface waters • Impact of hazardous constituents on the sediments of affected surface waters or the soils of the 100-yr floodplain			
A-4	Chemical and Physical Analysis	270.14(b)(2)	SECTION 2	4-260.04(a)(2)
	For each hazardous waste treated, stored or disposed at the facility, the following information should be provided:			
	• General description of the waste	Guidance		
	• Hazardous characteristics	Guidance		
	• Basis for hazard designation	Guidance		
	• Laboratory report on analyses results	Guidance		
	• Existing published or documented data on hazardous waste or hazardous waste from a similar process (new facilities only)			
A-5	Security			
	Security Procedures and Equipment	270.14(b)(4)	SECTION 4	4-260.04(a)(4)
	Unless a waiver is granted, this must include a description of the security procedures and equipment required.			
	24-Hour Surveillance System			
	A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) that continuously monitors and controls entry onto the active portion of the facility:			
	• Procedures and personnel to be used	Guidance		
	• Location and description of equipment	Guidance		
	Barrier and Means to Control Entry			
	(In lieu of a 24-hour surveillance system, the applicant may elect to use a barrier and other means to control entry.)			

Section B - Specific Information

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	POST-CLOSURE PLANS AND FINANCIAL REQUIREMENTS	270.14(b)(13) 270.14(b)(15) 270.14(b)(16)		4-260.04(a)(14) 4-260.04(d)(16) (4-260.04(a)(17)
B-1	Post-Closure Plan			
B-1a	Post-Closure Plan An owner or operator of a disposal facility must have a written post-closure plan. A copy of the approved plan and all revisions to the plan must be kept at the facility until the post-closure care begins. The plan must include the following:	270.14(b)(13) 270.17(g) 270.18(1) 270.20(f) 270.21(e) 264.117 264.118(a)	SECTION 4	4-260.04(a)(14) 4-260.04(b)(3)(gg 4-260.04(b)(4)(11 4-260.04(b)(6)(ff 4-260.04(b)(7)(ee 4-255.14(j) 4-255.14(n)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Description of ground water monitoring activities and frequencies • Description of maintenance activities and frequencies for: - Erosion Damage - Final containment structures - Facility monitoring equipment - Security devices - Vegetative cover - Run-on run-off control systems - Leachate collection, detection, and removal systems - Gas venting system - Groundwater monitoring system (saturated and/or unsaturated) - Fugitive dust control system - Crop prohibitions - pH control - Benchmark integrity	264.228(b) 264.228(c) 264.280(c) 264.310(b) Guidance		4-255.18(9)(b) 4-255.18(9)(c) 4-255.20(11)(cc) 4-255.21(11)(b)
	• Location(s) and number of copies of post-closure plan • Identification and location (address and phone number) of person responsible for storage and updating of facility copy of post-closure plan prior to closure • Identification and location (address and phone number) of person responsible for storage and updating facility copy of post-closure plan during post-closure period • Procedure for updating all other copies of post-closure plan	264.118(a)(3) Guidance	SECTION 4	4-255.14(n)(3)
c	Specific Post-Closure Plan Requirements Items B-2a(1) through B-2a(4) present specific post-closure plan requirements for surface impoundments, waste piles, land treatment facilities and landfills.			
B-2a(1)	Surface Impoundments For an owner or operator of a surface impoundment closed with wastes in place, the post-closure plan must include: • Procedures for maintenance and repair of final cover • Procedures for maintenance and monitoring of leak detection system • Procedures for maintenance and monitoring of groundwater monitoring system • Procedures for compliance with Subpart F • Procedures for preventing run-on/run-off final cover damage	270.17(g) 264.118 264.228(c)(1)	SECTION 4	4-260.04(b)(3)(gg) 4-255.14(n)(o)(p) 4-255.18(9)(c)(1)
B-2a(2)	Waste Piles For an owner or operator of a waste pile closed with wastes in place, the post-closure plan must include the same items as for a landfill including:	270.18(1) 264.118 264.258(b)	NA	4-260.04(b)(4)(ii) 4-255.14(n)(o) & (p) 4-255.19(9)(b)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Procedures for maintenance and repair of final cover • Monitoring and maintenance procedures for leak detection system • Procedure for leachate collection/removal system operation • Procedures to maintain and monitor groundwater monitoring system • Procedures for compliance with Subpart F • Procedures for preventing final cap erosion due to run-on and run-off • Procedures for protection and maintenance of benchmarks • Procedures to be undertaken if liquid is found in leak detection system	264.310(c)		4-255.21(11)(c)
B-2a(3)	Landfills An owner or operator of a landfill must include the following in the post-closure plan: • Procedures for maintenance and repair of final cover • Monitoring and maintenance procedures for leak detection system • Procedure for leachate collection/removal system operation • Procedures to maintain and monitor groundwater monitoring system • Procedures for compliance with Subpart F • Procedures for preventing final cap erosion due to run-on and run-off • Procedures for protection and maintenance of benchmarks • Procedures to be undertaken if liquid is found in leak detection system	270.21(e) 264.118 264.280(c) 264.310(b) 264.310(c)	NA	4-260.04(b)(7)(ee) 4-255.14(n)(o) & (p) 4-255.20(11)(c) 4-255.21(11)(b) 4-255.21(11)(c)
B-2a(4)	Land Treatment Facilities An owner or operator of a land treatment facility must include the following in the post-closure plan: • Procedures to enhance degradation of wastes in treatment zone • Procedure in maintaining vegetative cover • Procedure for maintaining run-on controls • Procedure for maintaining run-off controls • Procedure for wind dispersal control • Procedures to ensure compliance with food-chain crop prohibitions • Procedures for unsaturated zone monitoring	270.20(d)(6) 264.118 264.280(c)	NA	4-260.04(b)(6)(ff) 4-255.14(n)(o) & (p) 4-255.20(11)(c)
B-3	Notices Required for Disposal Facilities			
B-3a	Notice to Local Land Authority Documentation by applicant that within 90 days after closure a survey plat indicating location and dimensions of landfill cells or other disposal areas with respect to permanently surveyed benchmarks, along with a record of the type, location and quantity of hazardous waste within each cell or disposal area will be submitted to the appropriate local land use authority and to the Regional Administrator.	264.119	NA	4-255.13(p)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	Notice in Deed to Property Documentation by applicant that he has or will record a notation on the facility deed, or other instrument examined during a title research, that notifies any potential purchase of the property that: • The property has been used to manage hazardous waste • Use of the land is restricted to activities that will not disturb integrity of final cover system, or monitoring system during post-closure care period • Requirements stated under B-3a above has been complied with	270.14(b)(14) 264.120	APPENDIX L	4-260.04(a)(15) 4-255.13(q)
B-4	Post-Closure Cost Estimate If landfill, land treatment, surface impoundments, or waste piles are utilized, the application must include a post-closure or a contingent post-closure cost estimate prepared in accordance with 264.144: • Fully loaded labor rate • No salvage values • No operation credits (gas, crops, livestock) • Current year • Based on the extent of operation most likely to make post-closure most expensive • Inspection costs • Administration • Transportation	270.14(b)(16) 264.144 Guidance Guidance Guidance Guidance Guidance Guidance Guidance	TABLE 4-6 APPENDIX K	4-260.04(a)(17) 4.255.15(c)
B-5	Financial Assurance Mechanism for Post-Closure A copy of the established financial assurance mechanism for post-closure care adopted in compliance with 264.145. The mechanism must be one of the following (B-5(a) through B-5(f) and include due dates and use standard wording.	270.14(b)(16) 264.145 264.151	APPENDIX H	4-260.04(a)(17) 4-255.15(d) 4-255.15(h)
B-5a	Post-Closure Trust Fund A copy of the post-closure trust fund agreement with the wording required in 264.15(a)(1) and a formal certification of acknowledgement. • Bank of approval Institution • Mechanics – Pay-inperiod; life of permit or remaining life of facility, whichever is shorter – Annual payment; unfunded liability divided by years left in pay-in period	4-264.145(a) 264.151(a)(1)	NA	4-255.15(d)(2) 4-255.15(h)(2)
B-5b	Surety Bond A surety bond from a federal acceptable surety company meeting one of the following requirements: • Surety bond guaranteeing payment into a post-closure trust fund. A copy of the surety bond with the working required in 264.15(b), a copy of the standby trust fund agreement	264.145(b) & (c) 264.151(b) 264.151(c) 264.145(b)	NA	4-255.15(d)(2) & (3) 4-255.15(h)(2) 4-255.15(h)(3) 4-255.15(d)(2)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Surety bond guaranteeing performance of post-closure activities. A copy of the surety bond with wording required in Part 264.15(c), guaranteeing that the owner or operator will perform post-closure plan and the requirements of Subpart H	264.145(c)		4-255.15(d)(3)
-5c	Post-Closure Letter of Credit A copy of post-closure letter of credit with the wording required in 264.15(d) • Irrevocable letter of credit • At least one year period, automatic renewal • Standby trust fund • Amount reflects current cost estimate	264.145(c) 264.151(f)	NA	4-255.15(d)(3) 4-255.15(h)(6)
I-5d	Post-Closure Insurance To demonstrate that the owner or operator has post-closure insurance, he or she must submit to the Regional Administrator 60 days before hazardous waste is received a Certificate of Insurance worded as specified in 264.15(e). • Noncancellable policy, automatic renewal • Insurer licensed or eligible surplus lines carrier • Certificate of Insurance • Funds available whenever final post-closure occurs	264.145(e) 264.151(e)	NA	4-255.15(d)(5) 4-255.15(h)(6)
-e	Financial Test and Corporate Guarantee for Post-Closure To demonstrate that this test is met, an owner or operator must submit a letter signed by the company's chief financial officer that is worded as specified in 264.151(f) and meets the following criteria: • Tangible net work $10 million • Tangible net worth six times all closure and post-closure costs • U.S. assets at least 90 percent of total assets or at least six times all closure and post-closure costs • Bond rating requirements or alternative financial ratio tests • Application must include: - Copy of a report on the company's latest financial statements drafted by an independent certified public accountant (CPA) - Copy of a report from the the owner's or operators independent CPA to the owner or operator stating that he or she has examined the data in the letter from the chief financial officer and that it is consistent with the amounts in the independently-audited year-end financial statements for the latest fiscal year and that no matters came to attention to cause him to believe that this data should be adjusted	264.145(f) 264.151(f) 264.151(h)	APPENDIX H	4-255-15(d)(6) 4-255.15(h)(6) 4-255.15(h)(7)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	In lieu of the above items, the owner or operator may submit a corporate guarantee worded as required by 264.151(h). This guarantee provides that the guarantor, which must be the parent company of the owner or operator, will perform post-closure activities in accordance with the post-closure plan if the owner or operator fails to do so or will establish a post-closure trust fund for the owner or operator. A copy of these items should be submitted with the Part B for review by the permit writer.	264.145(f)(10)		4-255-15(d)(6)(kk)
B-5f	Combinations			
B-5f(1)	Use of Multiple Financial Mechanisms	264.145(g)	NA	4-255.15(d)(7) 4-255.15(e) See I-5(f)1., Use of Multiple....
	A copy of a combination of trust fund agreements, surety bond guaranteeing payment into a post-closure trust fund or letters of credit, insurance, and state assumption of responsibility, which provide financial assurance for the amount of post-closure. Combined financial assurance must be at least equal to the adjusted post-closure cost estimate. Financial assurance instruments must meet requirements of 264.143(a),(b),(d), or (e) which include post-closure trust fund, surety bond guaranteeing payment into a post-closure trust fund, post-closure letter of credit, and post-closure insurance, respectively.	264.149		
B-5f(2)	Use of Financial Mechanism for Multiple Facilities	264.145(h)	NA	4-255.15(d)(8)
	A copy of a financial assurance mechanism for more than one facility showing for each facility, the EPA ID Number, name, address, and amount of closure funds assured by the mechanism. Total funding must be no less than the sum required for each facility considered separately. Documents must be submitted to each Region where facilities are located. Financial test applies to the sum of closure and post-closure costs for all facilities.			

Section C - Groundwater Information

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	GROUNDWATER MONITORING			
C-1	Interim Status Monitoring Data	270.14(c)(1)	APPENDIX M	4-260.04(c)(1)
	Summary of groundwater monitoring data obtained during interim status period.			
C-2	General Hydrogeologic Information	270.14(c)(2)	SECTION 5	4-260.04(c)(2)
	Identification of uppermost aquifer and aquifers hydraulically interconnected beneath facility, including:			

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Groundwater flow direction and rate • Basis for identification			
C-3	Topographic Map Requirements Unless exempt from groundwater monitoring requirements, surface impoundments, waste piles, land treatment, and landfill facilities must include the following information on the topographic map: • Groundwater flow direction and rate (isometric graph) • Point of compliance • Groundwater monitoring wells • The extent of any plume • Hazardous waste management area The following required information may be incorporated into the topographic map if possible, or at least should be discussed in the test: • Groundwater flow rate • Boundaries of uppermost aquifer • Underlying interconnection between uppermost aquifer and low aquifer • Hydraulic downgradient limit • Waste management area • Uppermost aquifer (Although many of these items can be shown on a single map, it is allowable to use additional maps to display some of the information. Presentation of all of this information on a single map may sacrifice clarity.)	270.14(c)(2),(3),(4), (1)	SECTIONS 4 and 5 APPENDIX D FIGURE 4-2	4-260.04(c)(2),(3)(4)(aa)
	Contaminant Plume Description Description of any plume of contamination that has already entered groundwater from a regulated unit. • Delineation of extent of the plume on the topographic map • Identification and concentrations of Appendix VIII constituents throughout the plume or maximum concentrations of these constituents in the plume	270.14(c) 261, Appendix VIII	NA	4-260.04(c)(4) 4-236.08
C-5	General Monitoring Program Requirements Waiver request - applicant must certify that there will be no migration of liquid to uppermost aquifer during active life and post closure. If waiver is not requested, applicant must provide detailed plans and an engineering report describing proposed groundwater monitoring program to meet general groundwater monitoring requirements. The following information is required:	270.14(c)(5)	SECTION 4 SECTION 5 APPENDIX J FIGURE 4-2	4-260.04(c)(5)
C-5a	Description of Wells • Number of wells • Locations • Depths • Casing description • Assurance of unaffected background water measurements • Assurance of compliance point groundwater measurements		SECTION 4 FIGURE 4-2 SECTION 5	

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	Description of Sampling/Analysis Procedures		APPENDIX J	
	• Sample collection methods • Sample preservation/shipment • Analytical procedures • Chain-of-custody control • Documentation of proper sampling and analysis procedures • Procedure for determination of groundwater elevation with each sample			
C-5c	Procedures for Establishing Background Quality		SECTION 4	
	• Each hazardous constituent, or monitoring parameters and other constituents • One year quarterly monitoring data from downgradient well(s)			
C-5d	Statistical Procedures		SECTION 4	
	Statistical procedures specify the statistical comparison techniques that will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point. • Specify the statistical comparison procedures which will be used • Specify any equivalent statistical procedures which will be used			
C-6	Description of Detection Monitoring Program for Facilities Not Detecting the Presence of Hazardous Constituents Including:	270.14(c)(6)	SECTION 4 SECTION 5	4-260.04(c)(6)
	List of Indicator Parameters, Waste Constituents, Reaction Products to be Monitored, Including:	270.14(c)(b)(i)	SECTION 4 TABLE 4-5	4-260.04(c)(6)(aa)
	• Type, quantities, concentrations expected in waste • Mobility, stability, persistence in unsaturated zone • Detectability in groundwater • Concentrations or values and coefficients of proposed parameters in the groundwater background			
C-6b	Description of Groundwater Monitoring System	270.14(c)(6)(ii)	SECTION 5 APPENDIX I	4-260.04(c)(6)(bb)
	• Hydraulic downgradient limit • Waste management area • Uppermost aquifer			
C-6c	Background Groundwater Concentration Values for Proposed Parameters	270.14(c)(6)(iii)	SECTION 5	4-260.04(c)(6)(cc)
	• Use of an appropriate groundwater monitoring system, and • Quarterly sampling data (mean and coefficient of variation) of upgradient wells for one year, or • Quarterly sampling data (mean and coefficient of variation) of other wells for one year, and			

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
	• Data from a minimum of one sample/well and minimum of four samples for the entire system used to determine backgroundwater quality, or • Presentation of procedures to calculate such values (mean and coefficient of variation)			
:-6d	Description of Proposed Sampling, Analysis, and Statistical Comparison Procedures	270.14(c)(6)(iv)	SECTION 4 SECTION 5	4-260.04(c)(6)(dd)
	• Semiannual monitoring at compliance point • Sample collection methods • Sample preservation/shipment • Analytical procedures • Chain-of-custody control • Documentation of proper sampling and analysis procedures • Procedures for determining groundwater elevation • Procedures for determining statistically significant increase for any monitored parameter • Procedure for annual determination of uppermost aquifer flow rate and direction			
:-6e	Procedure to be Implemented If A Statistically Significant Increase In Any Constituent or Parameter Is Identified at Any Compliance Point Monitoring Well		SECTION 4	
:-7	Compliance Monitoring Program for Facilities Which Have Detected Presence of Hazardous Constituents	270.14(c)(7)	NA	4-260.04(c)(7)
:-7a	Description of Monitoring Program			
(1)	Description of Wastes Previously Handled at Facility	270.14(c)(7)(1)		44-260.04(c)(7)(aa)
:-7a(2)	Characterization of Contaminated Groundwater	270.14(c)(7)(ii)		4-260.04(c)(7)(bb)
	- Hazardous constituents identified - Hazardous Constituents concentrations			
:-7a(3)	List of Hazardous Constituents to be Compliance Monitored	270.14(c)(7)(iii)		4-260.04(c)(7)(cc)
:-7a(4)	Proposed Concentration Limits for Each Constituent	270.14(c)(7)(iv)		4-260.04(c)(7)(dd)
	• Justification for establishing alternative limits • Conditions warranting special sampling procedures • Importance of statistically significant values • Procedures for establishing background concentration values for constituents that are based on: - Use of an appropriate groundwater monitoring system; and - Data that is available prior to permit issuance - Data that accounts for measurement errors in sampling and analysis - Data that accounts for seasonal groundwater quality fluctuations - Data from a minimum of one sample per well and a minimum of four samples from monitoring system, each time system is sampled			

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
(5)	Detailed Plans of An Engineering Report Describing Groundwater Monitoring System - Represent quality of groundwater passing point of compliance - Proposed compliance point - Number of wells - Location and depths of wells - Casing and construction of wells	270.14(c)(7)(v)		4-260.04(c)(7)(ee)
C-7a(6)	Description of Proposed Sampling and Statistical Analysis Procedures Utilized Evaluating Groundwater Data - Compliance period - Sample collection methods - Sample preservation/shipment - Analytical procedures - Chain-of-custody control - Documentation of proper sampling and analysis procedures - Procedures for determining groundwater elevation - Sampling frequency (at least quarterly) - Procedures for annual determination of uppermost aquifer flow rate and direction - Annual testing procedures for Appendix VIII constituents • Procedures for determining a statistically signficant increase for any monitored parameters - Comparing compliance point data to the concentration limit using the procedure in 264.97(h)(2)	270.14(c)(7)(vi)		4-260.04(c)(7)(ff)
a(7)	Procedures To Be Implemented If Groundwater Protection Standard is Exceeded at Compliance Point Monitoring Well • Written notification to Regional Administrator • An application for permit modification to establish a corrective action program, including details of the program to comply with groundwater protection standard and details of groundwater monitoring to demonstrate effectiveness of the corrective action program			
C-7b	An Engineering Feasibility Plan for a Corrective Action Program	270.14(c)(7)		4-260.04(c)(7)
C-8	Description of Corrective Program	270.14(c)(8)	NA	4-260.04(c)(8)
C-8a	Corrective Action Program			
C-8a(1)	Characterization of Contaminated - Identified hazardous constituents - Concentrations of hazardous constituents	270.14(c)(8)(i)		4-260.04(c)(8)(aa)
C-8a(2)	Concentration Limit for Each Hazardous Constituent	270.14(c)(8)(ii)		4-260.04(c)(8)(bb)
C-8a(3)	Detailed Plan and An Engineering Report Describing the Corrective Actions To Be Taken - Time period necessary to implement corrective program	270.14(c)(8)(iii)		4-260.04(c)(8)(cc)

	Subject Requirement	40 CFR Section Nos.	Location in Application	State Regulations
(4)	Description of Groundwater Monitoring Program That Will Be Sufficient to Assess The Adequacy of Corrective Action	270.14(c)(8)(iv)		4.260.04(c)(8)(dd)
	• Procedure to remove or treat constituents in groundwater between compliance point and down-gradient facility boundary • Procedure for semiannually submitting written reports to the Regional Administrator on program effectiveness			
C-8b	Alternate Concentration Limits	270.14(c)(8)		4-260.04(c)(8)
	• Sufficient information to establish a compliance monitoring program • Justification for proposed concentration limits meeting requirements of 264.94	270.14(c)(7)		4-260.04(c)(7)
	Section D - Certification			
	CERTIFICATION	270.11	EPA APPLICATION FORM 1	4-260.02(o),(p),(q) & (r)
	• Certification of application by a principal executive of the company of at least the level of vice president • Certification by a general partner or proprietor for a partnership or sole proprietorship, respectively • Certification by a principal executive officer or ranking elected official for a municipality, state, federal, or other public agency.			

APPENDIX E

Legal Description of Facility Location

APPENDIX E

The legal description of the facility property is as follows:

TRACT NO. 1

That part of the souteast quarter of the southwest quarter and south half of the southeast quarter of Section Ten (10), Township Eighteen (18) South, Range Eighteen (18) West, bounded as follows:

From the center corner of the southwest quarter of Section Ten (10), Township Eighteen (18) South, range Eighteen (18) West, measure southwardly along the westerly line of the southeast quarter of the southwest quarter of Section Ten (10), twenty-two (22) feet to the southerly line of Fourteenth Avenue produced: thence measure eastwardly along said southerly line of Fourteenth Avenue six hundred ninety-six (696) feet to a point on treated cross tie for the point of beginning; thence continuing eastwardly along last described course (the southerly line of Fourteenth Avenue) six hundred twenty-six and nine-tenths (626.9) feet to a point on treated cross tie, said point being the intersection of the north and south center line of Section Ten (10) and the southerly line of Fourteenth Avenue; thence continuing eastwardly along said street line and making a deflection angle to the left of thirty-two minutes (0° 32') with last described course, thirteen hundred twenty and six-tenths (1,320.6) feet to a point on treated cross tie, said point being the intersection of the easterly line of the southwest quarter of the southeast quarter of Section Ten (10) and the southerly line of Fourteenth Avenue produced, and being forty (40) feet distant southerly measured along said easterly line of the southwest quarter of the southeast quarter of Section Ten (10), from the center corner of the southeast quarter of Section Ten (10), said course making an included inside angle of eighty-nine degrees, forty-one minutes (89° 41') with the easterly line of the southwest quarter of the southeast quarter of Section Ten (10); thence continuing eastwardly along last described course seventy-two (72) feet to a point on the westerly right of way line of the St. Louis-San Francisco Railway, being fifty (50) feet distant westerly measured at right angles from the center line of the main track of the St. Louis San Francisco Railway; thence southwestwardly along said right of way line and making an included inside angle of seventy-five degrees (75°) with last described course, one hundred thirteen and four-tenths (113.4) feet to the intersection of the St. Louis-San Francisco Railway and the Southern Railway right of way lines, said point being fifty (50) feet distant westerly at right angles from the center lines of the St. Louis-San Francisco Railway and Southern Railway main tracks; thence southwestwardly making an included inside angle of one hundred sixty-nine degrees, fifty-three minutes, thirty seconds (169° 53' 30") with last described course, (said course being parallel with and fifty (50) feet distant northwesterly at right angles from the center line of the main track of the Southern Railway), one hundred three and four-tenths (103.4) feet, to a point on the easterly line of the southwest quarter of the southeast quarter of Section Ten (10); thence southwardly along the easterly line of the southwest quarter of the southeast quarter of Section Ten (10), said course making a deflection angle to the left of twenty-four degrees, forty-seven minutes, thirty seconds (24° 47' 30") with last described course, fifty-nine and sixty-two hundredths (59.62) feet to a

point on treated cross tie, being distant twenty-five (25) feet northwesterly Southern Railway; thence southwestwardly parallel with and twenty-five (25) feet distant northwesterly at right angles from the center line of the main track of the Southern Railway, said course making an included inside angle of one hundred fifty-five degrees, twelve minutes, thirty seconds (155° 12' 30") with last described course, four hundred twenty-nine and two-tenths (429.2) feet to a point on treated cross tie; thence on a curve to the right having a varied radius and a total delta of twenty-one degrees, eleven minutes (21° 11') and being distant northwesterly twenty-five (25) feet at right angles from the center line of the main track of the Southern Railway, five hundred fourteen (514) feet to a point on treated cross tie; thence southwestwardly on a tangent to the curve at last described point, two hundred seventy-four and four-tenths (274.4) feet to a point on treated cross tie, said point being on the southerly line of Section Ten (10), and being fifty (50) feet distant northwesterly at right angles from the center line of the main track of the Southern Railway; thence westwardly along the southerly line of Section Ten (10), said course making an included inside angle of one hundred thirty-six degrees, fifty-one minutes, thirty seconds (136° 51' 30") with last described course, one hundred ninety-eight (198) feet to a point on treated cross tie; thence northwardly, making an included inside angle of eighty-eight degrees, six minutes (88° 6') with last described course, five hundred eight and five-tenths (508.5) feet to a point on treated cross tie (said course also being the easterly line of negro cemetery); thence westwardly making an included outside angle of eight-eight degrees, five minutes, thirty seconds (88° 5' 30") with last described course, eleven hundred thirteen and three-tenths (1,113.3) feet to a point on treated cross tie; thence continuing westwardly along last described course, three hundred seventy-seven (377) feet to a point on treated cross tie, (two last mentioned courses being also the northerly line of negro cemetery); thence northwardly making an included inside angle of eighty-nine degrees, twenty-three minutes (89° 23') with last described course one hundred seventy-one and eight-tenths (171.8) feet to a point on treated cross tie; thence eastwardly making an included inside angle of eighty-nine degrees, thirty minutes (89° 30') with last described course, eleven (11) feet to a point on treated cross tie, said point being on easterly line of street (not named); thence northwardly along said street line, said course making a deflection angle to the left of ninety-degrees, thirty minutes, thirty seconds (90° 30' 30") with last described course, five hundred (500) feet to a point on treated cross tie; thence eastwardly making an included inside angle of eighty-nine degrees, twenty-nine minutes, thirty seconds (89° 29' 30") with last described course, three hundred sixty-six (366) feet to a point on treated cross tie, said course being also the southerly line of lots 1, 2, 3, 4 and 5, and two lots not numbered, Block Two (2) of the Industrial city Addition; thence northwardly one hundred twenty (120) feet to the point of beginning; containing 46.6 acres, more or less.

TRACT NO. 2

That part of the southeast quarter of the northeast quarter, and all that part of the northeast quarter of the southeast quarter of Section Ten (10), Township Eighteen (18) South, Range Eighteen (18) West, lying north and west of the St. Louis-San Francisco Railway Company right of way, as it now runs, and containing 38 acres, more or less.

TRACT NO. 3

That part of the northwest quarter of the southeast quarter of Section Ten (10), Township Eighteen (18) South, Range Eighteen (18) West, bounded as follows:

Beginning at the southeast corner of the northwest quarter of the southeast quarter of Section Ten (10), Township Eighteen (18) South, Range Eighteen (18) West, thence north along the quarter section line thirteen hundred ten (1,310) feet; thence on a straight line in a southwesterly direction to a point five hundred (500) feet west of the southeast corner of the northwest quarter of the southeast quarter of said Section Ten (10); thence east five hundred (500) feet to the point and place of beginning, containing 7.3 acres, more or less.

TRACT NO. 4

That part of the southeast quarter of the southwest quarter and southwest quarter of the southeast quarter of Section Ten (10), Township Eighteen (18) South, Range Eighteen (18) West, bounded as follows:

Beginning at a point on the east line of Lowndes County, Mississippi two (2) acre gravel tract one hundred fifty-six and three-tenths (156.3) feet south of its northeast corner, being thirty (30) feet west of the southwestermost corner of tract No. 1 herein described; thence north eighty-three degrees then minutes (83° 10') east (exterior angle ninety degrees thirty-five minutes) along division line between said tract No. 1 and Union Cemetery (colored) lands fifteen hundred twenty and three-tenths (1,520.3) feet to the northeast corner of said Union Cemetery lands; thence south four degrees thirty minutes (4° 30') east (interior angle eighty-eight degrees thirty minutes) along east line of Union Cemetery fifty (50) feet; thence south seventy-nine degrees thirty-six minutes (79° 36') west fifteen hundred twenty-five (1,525) feet, more or less, to the southeast corner of said two acre gravel tract; thence north six degrees ten minutes (6° 10') west along the east line of s aid gravel tract one hundred forty-four and seven-tenths (144.7) feet to the point and place of beginning, containing 3.4 acres, more or less.

KERR-MCGEE CHEMICAL CORPORATION
FOREST PRODUCTS DIVISION
COLUMBUS, MISSISSIPPI WOOD PRESERVING FACILITY

CLOSURE PLAN
FOR HAZARDOUS WASTE SURFACE IMPOUNDMENTS

I. FACILITY DESCRIPTION

The Columbus wood preserving facility was built in 1928 and acquired by Kerr-McGee Corporation in 1964. The main plant site consists of approximately 90 acres (figure 1). At the present time, creosote coal tar solution is the only wood preservative used in the plant, although pentachlorophenol was also used until 1976. Wastewater generated by the wood preserving process is passed through a primary oil/water separator and then split into two streams for parallel passage through a secondary dual-compartment oil/water separator. Creosote settles in these vessels where it is recovered and returned to the process for reuse.

From the second stage separator, the waste streams are recombined and discharged to an aeration pond, then to an oxidation pond for final discharge to the Columbus Publicly Owned Treatment Works (POTW). In addition to treating the wastewater, the ponds have been used to collect and store oily preservtive and residue (hazardous waste K001) which are not removed by the oil/water separators. Both the aeration pond and oxidation pond have been in continuous service since January 25, 1983.

Figure 1

Main Plant Site and Location
Kerr-McGee Chemical Corporation

(1 page)

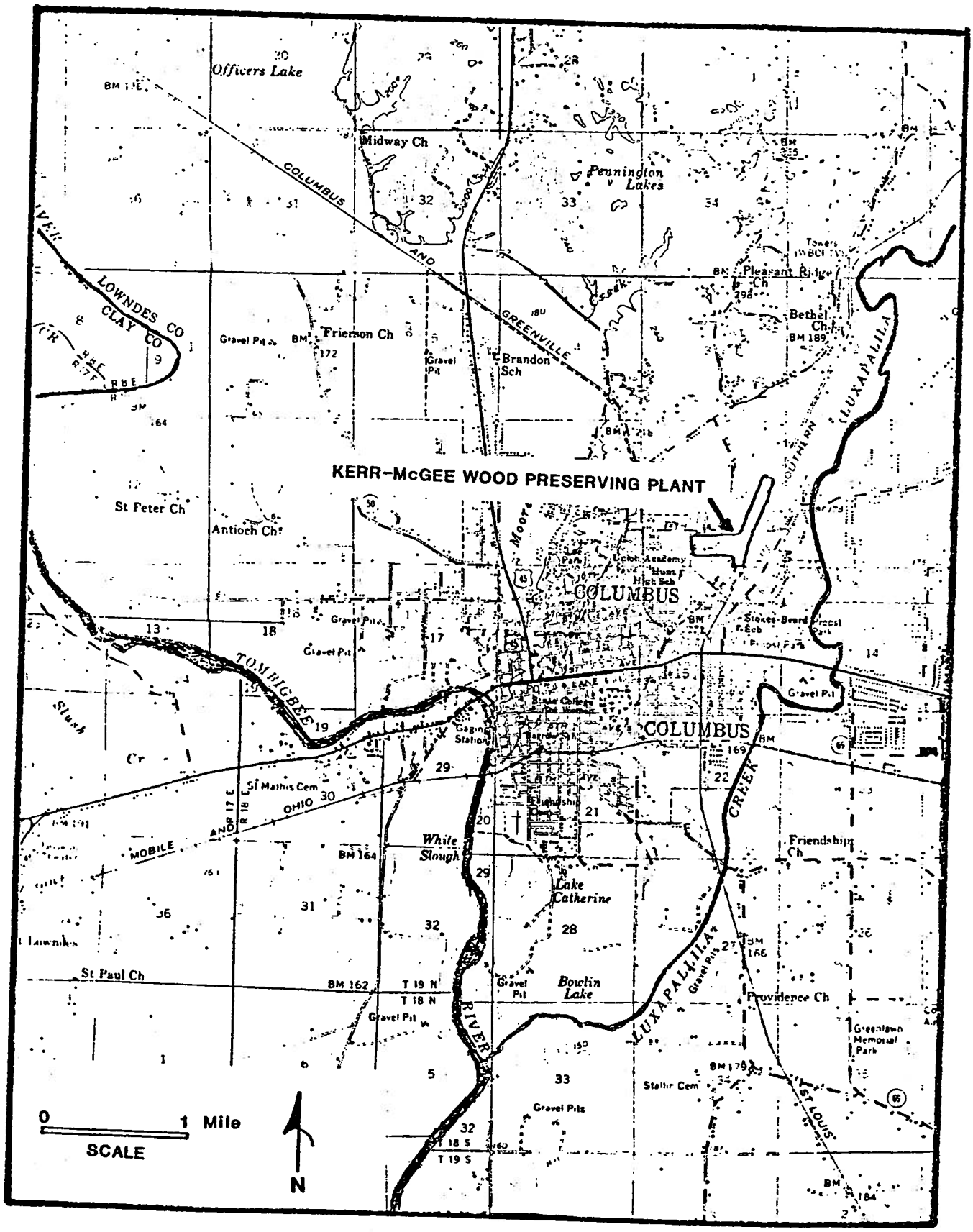


FIGURE 1: KERR-McGEE FACILITY LOCATION

The surface ponds were built in 1971 with approximately 1 foot of compacted native clay on the bottom. They total about 16,000 square feet surface area with an average water depth of 5.9 feet.

Steam condensate and water that is not contaminated with creosote are discharged into four condensate receiving tanks, then discharged to the aeration pond for commingling and discharge with process wastewater.

The water discharged to the POTW averages 20,000 gpd, measured by a V notch weir at the discharge box. Figure 2 is a schematic diagram of the Columbus wastewater management system.

At the present time the plant produces approximately 200,000 cross ties per year and has 43 employees. In 1983 the annual payroll exceeded $500,000, taxes were $70,000 and over $2,300,000 was spent for local goods and services. The anticipated life of this plant extends beyond 2014.

II. SUMMARY OF CLOSURE PLAN

This closure plan amends all other plans previously prepared for this facility and a copy is on file at the Columbus plant.

This plan eliminates the plant's surface impoundments (S04) that were identified in the Part A permit application (EPA form 3510) filed on November 13, 1980.

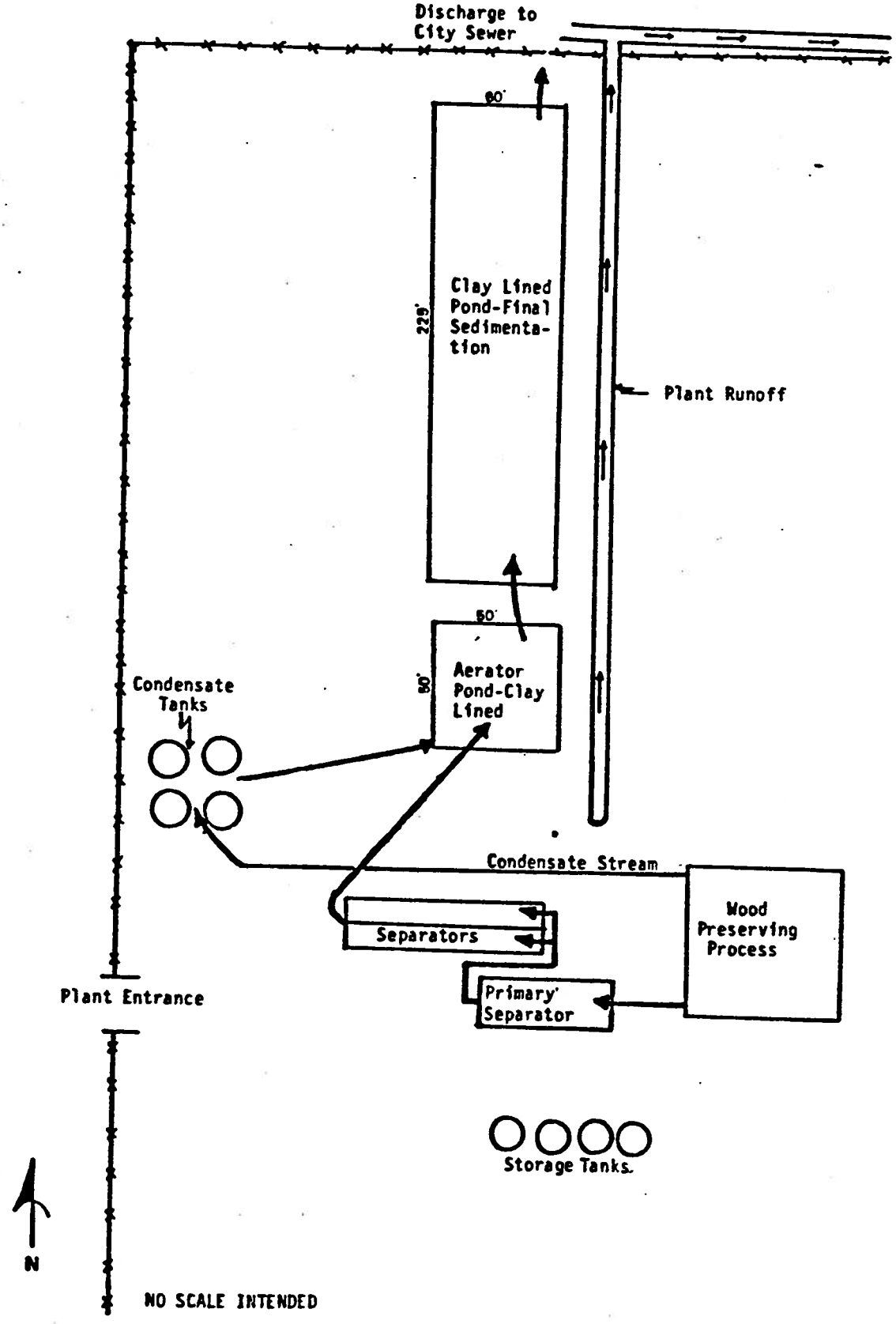
Figure 2

Schematic Diagram
Columbus Facility Wastewater
Management System

(1 page)

FIGURE 2

SCHEMATIC DIAGRAM
WASTEWATER MANAGEMENT SYSTEM
COLUMBUS FACILITY



The plant will maintain generator status and all hazardous waste in the future will be stored on site for less than 90 days and shipped off-site for disposal.

Before closure can begin, an improved wastewater treatment system will be installed, permitted and operated in accordance with Mississippi Water Pollution Control Law (Section 49-17-1, et seq., Mississippi Code of 1972). The system will pretreat the process wastewater prior to discharging it to the Columbus POTW. The new wastewater treatment system will replace the surface aeration pond and oxidation lagoon. The treated wastewater will comply with any requirements the Columbus POTW authority may deem as necessary prerequisites to the use of its sewage system and treatment works.

Kerr-McGee will provide engineering design and construction plans for the treatment system to the Mississippi Bureau of Pollution Control (MBPC) by October 15, 1984 together with treatment plant performance specifications on the quality of the treated water at the point of discharge, cost estimates, and a schedule for completion. The MBPC approval of the treatment plant design, performance specifications and application to construct, will be incorporated into this closure plan as Appendix I.

Closure of the surface impoundments will begin within 30 days after the last discharge of process wastewater to the ponds.

The following steps will be taken to close the surface impoundments:

1. Empty the ponds, discharging the water to the POTW.

2. Remove and recycle all liquid creosote.

3. Remove the residue and sludge from the bottom and sides of the ponds, together with contaminated soil to a depth acceptable to the MBPC; ship the contaminated material to Emelle, Alabama for final disposal.

4. Fold in berms, grade, level, compact and cover the area with native gravel for tie storage.

5. Decontaminate all equipment, tools and apparatus that contacted the contaminated material.

6. Certification of closure will be provided by KM and an independent registered professional engineer, to the MBPC. Approximate dates for periodic inspections are given in sections III and VI.

III. DETAILS OF CLOSURE PROCEDURES

A. MAXIMUM INVENTORY

The maximum inventory of process wastewater, creosote, and K001 residue in this facility is estimated to be 94,700 cubic feet (708,400 gallons) in both ponds. This includes approximately 81,500 cubic feet (610,000 gallons) of wastewater, and 10,500 cubic feet (78,700 gallons) of recoverable creosote on the bottom of the ponds. We estimate there is approximately 2 inches (200 cubic yard) of K001 residue and contaminated soil on the bottom and berm below the water line of the Impoundment.

B. EXISTING CONTAINMENT

The existing liquid containment is essentially equal to the maximum inventory. The water discharged to the POTW meets all existing pretreatment quality standards. Samples collected on February 18, 1984 were analyzed by Mississippi

State University with the following results:

PARAMETER	CONCENTRATION (ppm)
Oil and Grease	7.2
COD	10.0
BOD_5	9.75
TSS	8.8
TKN	0.25
Cu	0.05
Cr	0.01
As	0.01
pH	7.1

The amount of recoverable creosote, K001 residue waste and contaminated soil cannot be accurately determined until the standing liquids are removed. However, based on preliminary measurements made on April 4, 1984, we estimated approximately 10,500 cubic feet or 78,700 gallons of recoverable creosote on the bottom of the ponds, and less than 2 inches of K001 residue and contaminated soil or 200 cubic yards on the bottom and berm of the impoundment.

C. CLOSURE PROCEDURE

As previously described, a new wastewater treatment system will have been constructed and an operating permit obtained in accordance with Mississippi Water Pollution Control Law to pretreat and discharge process wastewater to the Columbus POTW. Engineering design specifications and construction details will be provided to MBPC and also placed in Appendix I of this plan for record.

When the new treatment system is installed the surface impoundments will no longer be needed, and they will be closed by the following procedures:

1. KMCC will notify the MBPC when the last wastewater is discharged to the surface aeration pond.

2. Permanently disconnect piping between surface aeration pond and new wastewater treatment system.

3. Thoroughly purge connecting pipe with live steam and hot fresh water and discharge into aeration pond.

4. Cut inlet connection pipe at aeration pond; remove pipe, and ship to Emelle, Alabama for disposal.

5. Remove the aerator and anchor lines. Clean these devices with live steam and by thoroughly flushing with hot clean water to decontaminate. Cleaning will be done simultaneously with draining the ponds. Place in facility process equipment storage yard.

6. Drain the ponds through the existing discharge sump at a rate of approximately 40,000 gpd, or at a rate acceptable to the Columbus POTW that will empty the ponds. At 40,000 gpd, approximately 15 days would be needed to discharge all wastewater.

7. After the aeration pond is empty, remove the drain pipe between the aeration pond and oxidation pond and ship to Emelle, Alabama for disposal.

8. When the wastewater is drained from both impoundments, remove and recycle back to process work tank No. 2 all recoverable creosote using conventional suction, pumping and collection equipment. This work tank isdedicated for the storage of all recycled creosote, which will be reused in the wood preserving process within 90 days following completion of the recovery project.

9. Remove all residual K001 sludge plus visibly stained soil from the bottom of both ponds and below the water line along the berms. This is presently estimated at 200 cu. yards. Properly manifest and ship in DOT approved vehicles to a permitted HW final disposal facility in Emelle, Alabama.

   Concern has been expressed by both the MBPC and Kerr-McGee about the amount of soil that must be removed from beneath the bottom and from the berms to assure that no pollutants remain. In other words a yardstick is needed to determine "how clean is clean". The MBPC is presently conducting a risk assessment study to determine the extent to which clean-up will be required. The results of the risk assessment will probably be available in

early 1985 for guidance on the Columbus closure procedure. This should fit with the proposed schedule for closure given in Section VI of this plan since final removal of bottom soil is scheduled for mid 1985.

10. Remove discharge weir, discharge sump and pipe; ship these materials to Emelle, Alabama for disposal.

11. Decontaminate all tools and earth moving equipment that were in contact contaminated material. Use hot, clean water and steam as necessary. Clean until all visible residue has been removed. Detergents will also be made available in the event steam and hot water is not sufficient to clean the equipment. Collect the wash water and return it to the oil/water separator for treatment in the wastewater pretreatment system prior to discharge to the POTW.

12. Fold in berms, grade and level area; bring in clean fill material if necessary. Compact and cover with gravel and use the reclaimed area for tie storage.

13. Certify that closure was performed in accordance with the approved plan; to be conducted by an independent registered P.E. and Kerr-McGee.

D. CONTACTS

Contact with the facility during closure should be made as follows:

1. Plant Superintendent
   Kerr-McGee Chemical Corporation
   Forest Products Division
   Wood Preserving Facility
   14the Avenue and 20the Street North
   P.O. Box 906
   Columbus,Mississippi 39701
   Phone number 601/328-7551
   Mr. Bobby Boisseau is plant
   Superintendent as of 4/1/84.

2. Supervisor of Environmental and
   Quality Control
   Kerr-McGee Chemical Corporation
   Forest Products Division
   123 Robert S. Kerr Avenue
   P.O. Box 25861
   Oklahoma City, OK 73125
   Phone 405/270-2395

   Mr. P. C. Gaskin was supervisor of
   Environmental Control as of 4/1/84.

IV. COST ESTIMATES

A. CLOSURE COST ESTIMATES

The cost of closure is estimated to be $266,600. The detailed closure cost estimate for this plan is given in Appendix II. The costs reflect the current inflation factor.

The major area of uncertainty is the cost for removing, transporting and disposing of an estimated amount of bottom sludge and contaminated soil. Kerr-McGee's estimate of the contaminated material quantity is believed conservative and adequate for cost estimating.

B. WASTE WATER PRETREATMENT SYSTEM

The wastewater pretreatment system must of course be in place and operating in accordance with State permits and local regulations before closure can begin. This is a separate project and cost estimates for that system are not considered part of closure. This information will be included in the application for a permit to construct that will be submitted on or before October 15, 1984. As previously stated, that application when approved by MBPC will be made part of the closure plan for information and reference, and Appendix I is reserved for that purpose.

V. FINANCIAL ASSURANCE, CLOSURE AND POST CLOSURE

Attached in Appendix III is the financial assurance document signed by the Chief Financial Officer of Kerr-McGee Corporation for closure costs. Also attached in Appendix III is a certificate of liability insurance for the hazardous waste facility provided under Harbor Insurance Company policy HI 167898.

These financial instruments comply with the requirements of 40 CFR 265, Subpart H.

VI. CLOSURE TIME SCHEDULE

The time schedule concerns two major actions. First, is the installation and operation of a wastewater pretreatment system that will replace the existing surface aeration and oxidation impoundments (S04). This new system must be completed and in operation under MBPC permit before the ponds can be closed. Second, is closure of the existing S04 units.

The overall time required for Closure is 6 months from authorization to proceed. The proposed time schedule is summarized below with indicated contingency periods based on present day uncertainties.

Figure 3 is a bar graph showing time increments and overlapping or simultaneous actions in the forecast.

1984

On or about July 1	Response from the MBPC giving general approval to this proposed closure plan and authorizing KM to proceed. Kerr-McGee will then proceed as follows:
July 8	Continental Engineering, Aberdeen, MS, has been retained to prepare the design, construction and performance specifications for the wastewater pretreatment system.

September 14	Submit proposed plans and specifications on wastewater treatment system to MBPC for information, comment and concurrence. Also inform the Columbus POTW authorities and provide them with same information.
September 17	Submit final revised Closure Plan to MBPC.
October 15	Submit final plans, drawings, specifications and completion schedule to MBPC for approval. Incorporate this information into closure plan as Appendix I. Apply for permit to construct.
November 13	Receive permit to construct. Begin ground preparation and foundations for new wastewater treatment system.
January 22, 1985	KM receives final approval of closure plan from the MBPC.
February 1	Complete installation of surface tanks, piping, pumps, etc. for new treatment system. This date is contingent upon delivery of components, weather and all contributing factors. Check out flows and equipment functions using clean water. Discharge clean water to oil/water separator for discharge to the ponds. Incremental progress inspection by P.E. and KM representatives for compliance with plan.
February 15	Begin operational tests of new system using plant process wastewater. Sample treated water for quality. Discharge through existing aeration and oxidation ponds. Apply for discharge permit modification.

March 1	Receive modified operating permit from MBPC. Notify Columbus POTW and MBPC the new treatment system is operational. P.E. inspection.
March 5	Final discharge of HW water to the surface impoundments. Notify MBPC and POTW. Begin discharge of pretreated water to the POTW sewer system. Begin closure of surface impoundments according to approved plan. This date, as are others in the foregoing schedule, is contingent upon approval of the plan by the MBPC and the concurrence by POTW authorities without imposing other requirements that would change this schedule.
April 20	Complete the removal of recoverable creosote and mobile sludge from ponds for reuse in the plant.
May 31	Complete removal of bottom sludge, contaminated soil, discharge weir, and sump. Ship to Emelle, Alabama for final disposal. Interim inspection by P.E. for compliance with plan.
June 22	Complete leveling, grading and compacting closed site for use as tie storage area.
July 22	Final inspection. Notify MBPC and provide certifications of closure.

Figure 3

Bar Graph - Compliance Schedule
For Columbus Wastewater Treatment System and
Closure Program

(1 page)

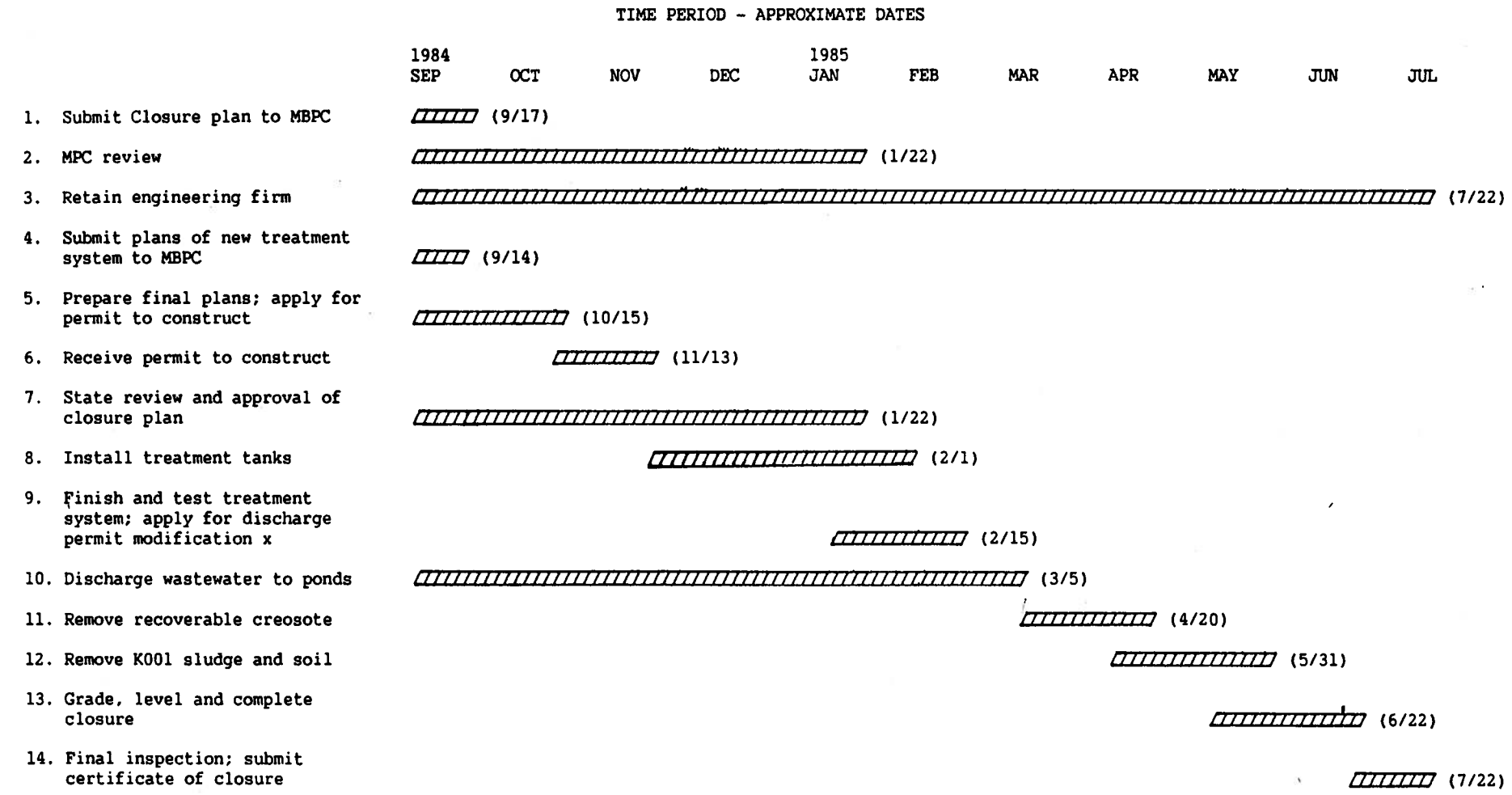


FIG. 3 COMPLIANCE SCHEDULE FOR COLUMBUS WASTEWATER TREATMENT SYSTEM AND CLOSURE PROGRAM

APPENDIX I

RESERVED

NEW PROCESS WASTEWATER TREATMENT SYSTEM, ENGINEERING DESIGN, CONSTRUCTION, PERFORMANCE SPECIFICATIONS, COST ESTIMATES, COMPLETION SCHEDULE

APPENDIX II

CLOSURE COST ESTIMATES
(3 pages)

APPENDIX II

CLOSURE COST ESTIMATES

A. NEW WASTEWATER TREATMENT SYSTEM

1.	Foundations	$3,500.
2.	Purchase and install four (4) wastewater treatment tanks of 15,000 gallons each	20,000.
3.	Chemical treatment	7,500.
4.	Dual Pump lift station	10,000.
5.	Sewer main connection to POTW.	5,000.
6.	Discharge water meter and monitoring station	2,500.
7.	Piping, valves and controls	16,000.
8.	Electrical	5,000.
9.	Installation	18,000.
	Subtotal	$87,500.

B. SURFACE IMPOUNDMENT CLOSURE

1.	Dewater impoundments		
	a)	Wastewater to be pumped to the Columbus POTW - 708,400 gals.	
	b)	Pump and hose rental	$ 4,000
	c)	Pipe, fittings and installation at $65/day for 25 days	1,600
	d)	Wastewater analysis prior to and during discharge	600
2.	Recover bottom creosote sludge and recycle - 78,700 gals.		
	a)	Purchase pump, hose, pipe and fittings	12,000
	b)	Installation	8,000
3.	Removal of K001 hazardous waste and contaminated soil - 200 yds.		
	a)	Excavation and loading at $65/hr.	10,000

	b)	Hauling to CWM Landfill, Emelle, Alabama (CWM Proposal) $310/20 ton load ($7,750) $50/truck for liner ($1,250)	9,600
	c)	CWM Landfill disposal fees $43/ton disposal fee ($21,500) $5/ton Alabama tax ($2,500)	24,000
	d)	Waste analysis prior to and during disposal 5 samples at $1,000/sample (by CMS)	5,000
	e)	Analysis of soil after waste is removed	2,000
4.		Equipment rental	8,000
5.		Backfill with compaction 7315 cu. yds. at $3.50/yd.	8,100
6.		Decontamination of tools and equipment $3/MCF nat. gas - 16 hours.	800
7.		Construction of site for tie storage yard	
	a)	Site drainage and grading 40 hrs. at $65/hr.	2,600
	b)	Stone for site stabilization and roadways 450 yds. at $5.50/yd.	2,500
	c)	Final grading and compacting at $65/hr. for grader	1,100
8.		Labor and supervision	20,000
		Subtotal	$119,900
C.	ENGINEERING		
1.		Plans and specifications	$ 20,000
2.		Surveying and supervision	10,000
3.		Certification	5,000
		Subtotal	$ 35,000
D.	CONTINGENCY FACTOR (10%)		$ 24,200

E. TOTAL CLOSURE COST ESTIMATE

1.	New wastewater treatment system	$ 87,500
2.	Surface Impoundment Closure	119,900
3.	Engineering	35,000
4.	Contingency (10%)	24,200
	Total	$266,600

APPENDIX III

FINANCIAL ASSURANCE AND
CERTIFICATE OF LIABILITY
INSURANCE DOCUMENTS

(11 pages)

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

March 26, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Executive Director
Mississippi Department of Natural Resources
P. O. Box 10385
Jackson, Mississippi 39209

Attention: Robert A. Lee, Hazardous Waste Section

Dear Executive Director:

I am the Chief Financial Officer of Kerr-McGee Corporation of Kerr-McGee Center, Oklahoma City, OK 73125. This letter is in support of the use of the financial test to demonstrate financial responsibility for closure and post closure care as specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265.

The firm identified above is the owner or operator of the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265: NONE.

1. The firm identified above owns or operates the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility: NONE.

2. The firm identified above guarantees, through the corporate guarantee specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265, the closure or post-closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility:

EPA Identification No., Name & Address	Cost Estimates	
	Closure	Post-Closure
MSD 990866329 Kerr-McGee Chemical Corporation 607 14th Street, North Columbus, MS 39701	$428,000	N/A

EPA Identification No., Name & Address	Cost Estimates Closure	Post-Closure
MSD 081387730 Kerr-McGee Chemical Corporation Highway 11 South P. O. Box 789 Meridian, MS 39301	$ 91,000	$113,000

3. In states where DNR is not administering the financial requirements of Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility:

EPA Identification No., Name & Address	Cost Estimates Closure	Post-Closure
NVD 008290330 Kerr-McGee Chemical Corporation P. O. Box 53 Henderson, NV 89015	$ 187,000	$114,000
MOD 007128978 Kerr-McGee Chemical Corporation P. O. Box 6208 2300 Oakland Kansas City, MO 64126	$ 103,000	N/A
OKD 000396549 Kerr-McGee Refining Corporation P. O. Box 305 Wynnewood, OK 73098	$ 211,000	$ 95,000

EPA Identification No., Name & Address	Cost Estimates Closure	Post-Closure
ALD 071937890 Kerr-McGee Chemical Corporation Mobile Facility P. O. Box 629 Theodore, AL 36590	$1,150,000	$253,000
TXD 057111403 Kerr-McGee Chemical Corporation 155 Buchanan Rd. Texarkana, TX 75501	$ 708,000	N/A
TXD 0656447376 Southwestern Refining Company, Inc. P. O. Box 9217 Corpus Christi, TX 78408	$ 34,000	$408,000
ILD 020367561 Kerr-McGee Chemical Corporation P. O. Box 166 Madison, IL 62060	$1,665,000	N/A

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE.

This firm is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1983.

(SEE PAGE 4)

ALTERNATIVE I
(THOUSANDS OF DOLLARS)

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates shown in the four paragraphs above)	$ 5,560
*2.	Total liabilities (if any portion of the closure or post-closure cost estimates is included in total liabilities, you may deduct the amount of that portion from this line and add that amount to lines 3 and 4)	$2,074,110
*3.	Tangible net worth	$1,700,173
*4.	Net Worth	$1,732,824
*5.	Current assets	$ 929,186
*6	Current liabilities	$ 713,169
7.	Net working capital (line 5 - line 6)	$ 216,017
*8.	The sum of net income plus depreciation, depletion and amortization	$ 401,046
9.	Total assets in U.S. (required only if less than 90% of firm's assets are located in the U.S.)	$ 3,001,30

		YES	NO
10.	Is Line 3 at least $10 million?.....	X	
11.	Is line 3 at least 6 times line 1?.....	X	
12.	Is line 7 at least 6 times line 1?.....	X	
13.	Are at least 90% of firm's assets located in the U.S.?..... (If not, complete line 14)		X
14.	Is line 9 at least 6 times line 1?.....	X	
15.	Is line 2 divided by line 4 less than 2.0?.....	X	
16.	Is line 8 divided by line 2 greater than 0.1?.....	X	
17.	Is line 5 divided by line 6 greater than 1.5?.....		X

I hereby certify that the wording of this letter is identical to the wording specified in Subpart H of the Mississippi Hazardous Waste Regulations as such regulations were constituted on the date shown immediately below.

Marvin K. Hambrick

Marvin K. Hambrick
Title: Executive Vice President Finance

Date: March 26, 1984

cc: Mr. Jack McMillian, Director
(Division of Solid Waste Management)

ARTHUR ANDERSEN & CO.

20 BROADWAY, SUITE 1200
OKLAHOMA CITY, OKLAHOMA 73102
(405) 236-1491

March 28, 1984

Kerr-McGee Corporation
Kerr-McGee Center
Post Office Box 25861
Oklahoma City, Oklahoma 73125

Dear Sirs:

We have examined the consolidated balance sheet of Kerr-McGee Corporation and subsidiary companies (the "Company") as of December 31, 1983, and the related statements of income, retained earnings, capital in excess of par value and changes in financial position for the year then ended and have expressed an unqualified opinion on those statements in our report dated March 2, 1984. We have not performed any auditing procedures since that date. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

At your request, we have read the letter dated March 26, 1984, from your chief financial officer to the Mississippi Department of Natural Resources to demonstrate assurance of closure and post-closure care required by EPA regulations. As further required by such regulations, we have compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements as of and for the year ended December 31, 1983, referred to above with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data should be adjusted.

This report relates only to the data specified above and does not extend to the financial statements of the Company, taken as a whole, for the year ended December 31, 1983. It is furnished solely for the use of the Company and the Company's distribution to the Mississippi Department of Natural Resources and is not to be used for any other purpose.

Very truly yours,

Arthur Andersen & Co.

CORPORATE GUARANTEE FOR CLOSURE OR POST-CLOSURE CARE

Guarantee made this 26th day of March, 1984 by Kerr-McGee Corporation, a business corporation organized under the laws of the State of Delaware, herein referred to as guarantor, to the Mississippi Department of Natural Resources (MSDNR), obligee, on behalf of our subsidiary Kerr-McGee Chemical Corporation, of Kerr-McGee Center, Oklahoma City, Oklahoma 73125.

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in the Mississippi Hazardous Waste Regulations Rules 264.143(f), 264.145(f), 265.143(e), and 265.145(e).

2. Kerr-McGee Chemical Corporation owns or operates the following hazardous waste management facilities covered by this guarantee:

EPA Identification No., Name & Address	Cost Estimates	
	Closure	Post-Closure
MSD 081387730 Kerr-McGee Chemical Corporation Highway 11 South P. O. Box 789 Meridian, MS 39301	$ 91,000	$113,000
MSD 990866329 Kerr-McGee Chemical Corporation 607 14th Street, North Columbus, MS 39701	$428,000	N/A

3. "Closure plans" and "post-closure plans" as used below refer to the plans maintained as required by Subpart G of the Mississippi Hazardous Waste Regulation Rules 264 and 265 for the closure and post-closure care of facilities as identified above.

4. For value received from Kerr-McGee Chemical Corporation, guarantor guarantees to MSDNR that in the event that Kerr-McGee Chemical Corporation fails to perform closure and post-closure care of the above facilities in accordance with the closure or post-closure plans and other permit or interium status requirements whenever required to do so, the guarantor shall do so or establish a trust fund as specified in Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 or 265, as applicable, in the name of Kerr-McGee Chemical Corporation in the amount of the current closure or post-closure cost estimates as specified in Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 and 265.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the Executive Director of the MSDNR and to Kerr-McGee Chemical Corporation that he intends to provide alternate financial assurance as specified in Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 or 265, as applicable, in the name of Kerr-McGee Chemical Corporation. Within 120 days after the end of such fiscal year, the guarantor shall establish such financial assurance unless Kerr-McGee Chemical Corporation has done so.

6. The guarantor agrees to notify the Executive Director of the MSDNR by certified mail, of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming guarantor as debtor, within 10 days after commencement of the proceeding.

7. Guarantor agrees that within 30 days after being notified by the Executive Director of the MSDNR of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor of closure or post-closure care, he shall establish alternate financial assurance as specified in Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 or 265, as applicable, in the name of Kerr-McGee Chemical Corporation unless Kerr-McGee Chemical Corporation has done so.

8. Guarantor agrees to remain bound under this guarantee notwithstanding any or all of the following:

> amendment or modification of the closure or post-closure plan, amendment or modification of the permit, the extension or reduction of the time of performance of closure or post-closure, or any other modification or alteration of an obligation of the owner or operator pursuant to the Mississippi Hazardous Waste Regulation Rules 264 or 265.

9. Guarantor agrees to remain bound under this guarantee for so long as Kerr-McGee Chemical Corporation must comply with the applicable financial assurance requirements of Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 and 265 for the above-listed facilities, except that guarantor may cancel this guarantee by sending notice by certified mail to the Executive Director of the MSDNR and to Kerr-McGee Chemical Corporation, such cancellation to become effective no earlier than 120 days after receipt of such notice by both the MSDNR and Kerr-McGee Chemical Corporation, as evidenced by the return receipts.

10. Guarantor agrees that if Kerr-McGee Chemical Corporation fails to provide alternate financial assurance as specified in Subpart H of the Mississippi Hazardous Waste Regulation Rules 264 or 265, as applicable, and obtain written approval of such assurance from the Executive Director of the MSDNR within 90 days after a notice of cancellation by the guarantor is received by the Executive Director of the MSDNR from guarantor, guarantor shall provide such alternate financial assurance in the name of Kerr-McGee Chemical Corporation.

11. Guarantor expressly waives notice of acceptance of this guarantee by the MSDNR or by Kerr-McGee Chemical Corporation. Guarantor also expressly waives notice of amendments or modifications of the closure and/or post-closure plan and of amendments or modifications of the facility permit(s).

I hereby certify that the wording of this guarantee is identical to the wording specified in the Mississippi Hazardous Waste Regulation Rule 264.151(h) as such regulations were constituted on the date first above written.

Effective date: March 31, 1984

KERR-McGEE CORPORATION

By: Marvin K. Hambrick
Marvin K. Hambrick
Executive Vice President, - Finance

Margaret Kelley
Signature of Witness

KERR-McGEE
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

January 13, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David Lee, Chief
Hazardous Waste Section
Mississippi Department of Natural Resources
Division of Solid Waste Management
P. O. Box 10385
Jackson, Mississippi 39209

Re: Kerr-McGee Chemical Corporation
EPA I.D. #MSD 007025117
Hamilton, Mississippi Location
EPA I.D. #MSD 990866329
Columbus, Mississippi Location
EPA I.D. #MSD 081387730
Meridian, Mississippi Location

Dear Mr. Lee:

Attached is Hazardous Waste Facility Certificate of Liability Insurance for Kerr-McGee Chemical Corporation. The certificate demonstrates evidence of the liability insurance for non-sudden (gradual) occurences, as required.

We trust you will find the certificate in order; however, should there be any questions, please advise.

Very truly yours,

Charlotte Hix
Insurance & Claims Department

CH/vmr

Attachment

cc: E. T. Still

HAZARDOUS WASTE FACILITY

CERTIFICATE OF LIABILITY INSURANCE

1. Harbor Insurance Company, the "Insurer", of Los Angeles, California, hereby certifies that it has issued liability insurance covering bodily injury and property damage to Kerr-McGee Chemical Corporation, (the "insured"), of Kerr-McGee Center, Oklahoma City, Oklahoma in connection with the Insured's obligation to demonstrate financial responsibility under Mississippi Hazardous Waste Regulations Part 264.147 or 265.147.
The coverage applies at:

EPA I.D. #MSD 007025117
Kerr-McGee Chemical Corporation
Highway 45 North
P. O. Box 368
Hamilton, Mississippi 39746

EPA I.D. #MSD 990866329
Kerr-McGee Chemical Corporation
Forest Products Division
607 14th Street, North
Columbus, Mississippi 39701

EPA I.D. #MSD 081387730
Kerr-McGee Chemical Corporation
Forest Products Division
Highway 11 South, P. O. Box 789
Meridian, Mississippi 39301

for nonsudden accidental occurrences.

The limits of liability are: $3,000,000 each occurrence
$6,000,000 annual aggregate

exclusive of legal defense costs. The coverage is provided under policy number HI 167898 issued on January 16, 1984. The effective date of said policy is January 16, 1984.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

(a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the Insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in Mississippi Hazardous Waste Regulations Part 264.147(f) or 265.147(f).

(c) Whenever requested by the Executive Director of the Mississippi Department of Natural Resources

the Insurer agrees to furnish to the Executive Director of the Mississippi Departmenf of Natural Resources a signed duplicate original of the policy and all endorsements.

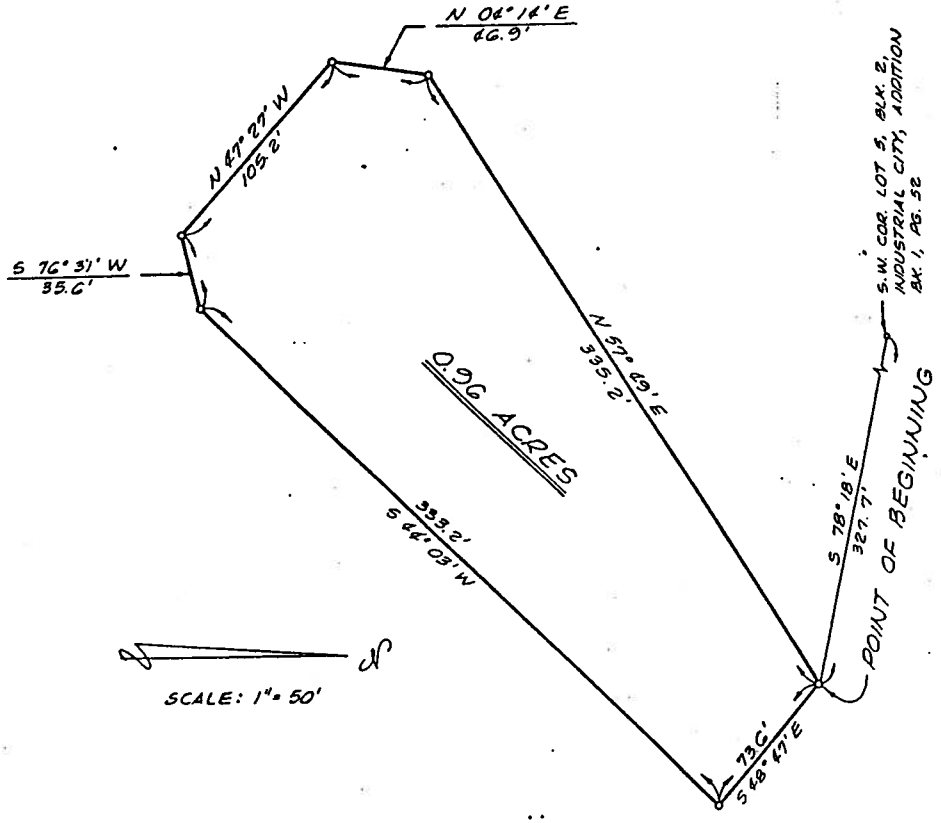
(d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Executive Director of the Mississippi Department of Natural Resources.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Executive Director, Mississippi Department of Natural Resources.

I hereby certify that the wording on this instrument is identical to the wording specified in the Mississippi Hazardous Waste Regulations Part 264.151(j)
as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Rodman A. Frates
Signature of Authorized Representative of Insurer

Rodman A. Frates
Authorized Representative of
Harbor Insurance Company
720 N.W. 50th Street
P. O. Box 18839
Oklahoma City, Oklahoma 73154



DESCRIPTION

Commencing at point marking the Southwest corner of Lot 5, Block 2, Industrial City, Addition, as recorded in Plat Book 1, Page 52 of the Lowndes County Chancery records, Lowndes County, Mississippi; Run thence South 78 degrees 18 minutes East 327.7 ft. to the POINT OF BEGINNING of the herein described tract:

Run thence South 48 degrees 47 minutes East 73.6 ft. to a point; Run thence South 44 degrees 03 minutes West 333.2 ft. to a point; Run thence South 76 degrees 31 minutes West 35.6 ft. to a point; Run thence North 47 degrees 27 minutes West 105.2 ft. to a point; Run thence North 06 degrees 14 minutes East 46.9 ft. to a point; Run thence North 57 degrees 49 minutes East 335.2 ft. to the POINT OF BEGINNING, containing 0.96 acres, more or less, and being situated in the SW 1/4 of Section 10, T 17 S, R 18 W, Lowndes County, Mississippi.

O. M. MITCHELL
Registered
Land
Surveyor
LS-2247
STATE OF MISSISSIPPI

PREPARED BY:
OLIVER MITCHELL & ASSOCIATES, INC.
CONSULTING ENGINEERS
COLUMBUS, MISSISSIPPI
FEBRUARY 16, 1987

LOCATION SURVEY OF CLOSED HAZARDOUS WASTE PON
KERR-McGEE CHEMICAL CORP.
COLUMBUS, MS

SURVEY OF PART OF THE SW 1/4, SEC. 10, T17S, R18
LOWNDES COUNTY, MISSISSIP

OMA-87-C

ADDENDUM TO WARRANTY DEED

CONTROLLED INDUSTRIAL WASTE DISPOSAL SITE DESIGNATION

KNOW ALL MEN BY THESE PRESENT:

THAT, for the purposes of complying with Part 265 of the Mississippi Department of Natural Resources, Bureau of Pollution Control, Hazardous Waste Management Regulations, Kerr-McGee Chemical Corporation, Forest Products Division, designates the following non-commercial controlled industrial waste site in Lowndes County, Mississippi:

Commencing at point marking the Southwest corner of Lot 5, Block 2, Industrial City Addition, as recorded in Plat Book 1, Page 52 of the Lowndes County Chancery records, Lowndes County, Mississippi; run thence South 78 degrees 8 minutes East 327.7 ft. to the POINT OF BEGINNING of the herein described tract:

Run thence South 48 degrees 47 minutes East 73.6 ft. to a point;
Run thence South 44 degrees 03 minutes West 333.2 ft. to a point;
Run thence South 76 degrees 31 minutes West 35.6 ft. to a point;
Run thence North 47 degrees 27 minutes West 105.2 ft. to a point;
Run thence North 04 degrees 14 minutes East 46.9 ft. to a point;
Run thence North 57 degrees 49 minutes East 335.2 ft. to the POINT OF BEGINNING, containing 0.96 acres, more or less, and being situated in the SW/4 of Section 10, Township 17 South, Range 18 West, Lowndes County, Mississippi.

The area described above by metes and bounds is a closed disposal site for controlled industrial waste. The waste previously deposited therein was hazardous, consisting of bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol, EPA Code K001. The waste was removed in accordance with closure plan approved by The Mississippi Department of Natural Resources, Bureau of Pollution Control. However, some soil contaminated with constituents of the waste remains in place. Therefore, use of this land is restricted under 40 CFR 265.117(c) for 30 years after the date of completing closures.

The survey plat of the closed site and a record of the type, location and quantities of waste deposited of on this property has been filed with the Mississippi Department of Natural Resources, Bureau of Pollution Control.

The site owner and operator is Kerr-McGee Chemical Corporation, Forest Products Division, P.O. Box 25861, Oklahoma City, Oklahoma 73125.

KERR-McGEE CHEMICAL CORPORATION

ATTEST:

Don Hager, Assistant Secretary

By A.L. Martin, Vice President

STATE OF OKLAHOMA)
) SS
COUNTY OF OKLAHOMA)

On the 9th day of March, 1987, personally appeared before me A.L. Martin, who, being by me duly sworn, did say, that he is the Vice President of Kerr-McGee Chemical Corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws, and said Don Hager, Assistant Secretary, acknowledged to me that said corporation executed same.

M Notary Public

ADDENDUM TO WARRANTY DEED

CONTROLLED INDUSTRIAL WASTE DISPOSAL SITE DESIGNATION

KNOW ALL MEN BY THESE PRESENT:

THAT, for the purposes of complying with Part 265 of the Mississippi Department of Natural Resources, Bureau of Pollution Control, Hazardous Waste Management Regulations, Kerr-McGee Chemical Corporation, Forest Products Division, designates the following non-commercial controlled industrial waste site in Lowndes County, Mississippi:

Commencing at point marking the Southwest corner of Lot 5, Block 2, Industrial City Addition, as recorded in Plat Book 1, Page 52 of the Lowndes County Chancery records, Lowndes County, Mississippi; run thence South 78 degrees 8 minutes East 327.7 ft. to the POINT OF BEGINNING of the herein described tract:

Run thence South 48 degrees 47 minutes East 73.6 ft. to a point;
Run thence South 44 degrees 03 minutes West 333.2 ft. to a point;
Run thence South 76 degrees 31 minutes West 35.6 ft. to a point;
Run thence North 47 degrees 27 minutes West 105.2 ft. to a point;
Run thence North 04 degrees 14 minutes East 46.9 ft. to a point;
Run thence North 57 degrees 49 minutes East 335.2 ft. to the POINT OF BEGINNING, containing 0.96 acres, more or less, and being situated in the SW/4 of Section 10, Township 18 South, Range 18 West, Lowndes County, Mississippi.

The area described above by metes and bounds is a closed disposal site for controlled industrial waste. The waste previously deposited therein was hazardous, consisting of bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol, EPA Code K001. The waste was removed in accordance with closure plan approved by The Mississippi Department of Natural Resources, Bureau of Pollution Control. However, some soil contaminated with constituents of the waste remains in place. Therefore, use of this land is restricted under 40 CFR 265.117(c) for 30 years after the date of completing closures.

The survey plat of the closed site and a record of the type, location and quantities of waste deposited of on this property has been filed with the Mississippi Department of Natural Resources, Bureau of Pollution Control.

The site owner and operator is Kerr-McGee Chemical Corporation, Forest Products Division, P.O. Box 25861, Oklahoma City, Oklahoma 73125.

KERR-McGEE CHEMICAL CORPORATION

ATTEST:

Don Hager

Don Hager, Assistant Secretary

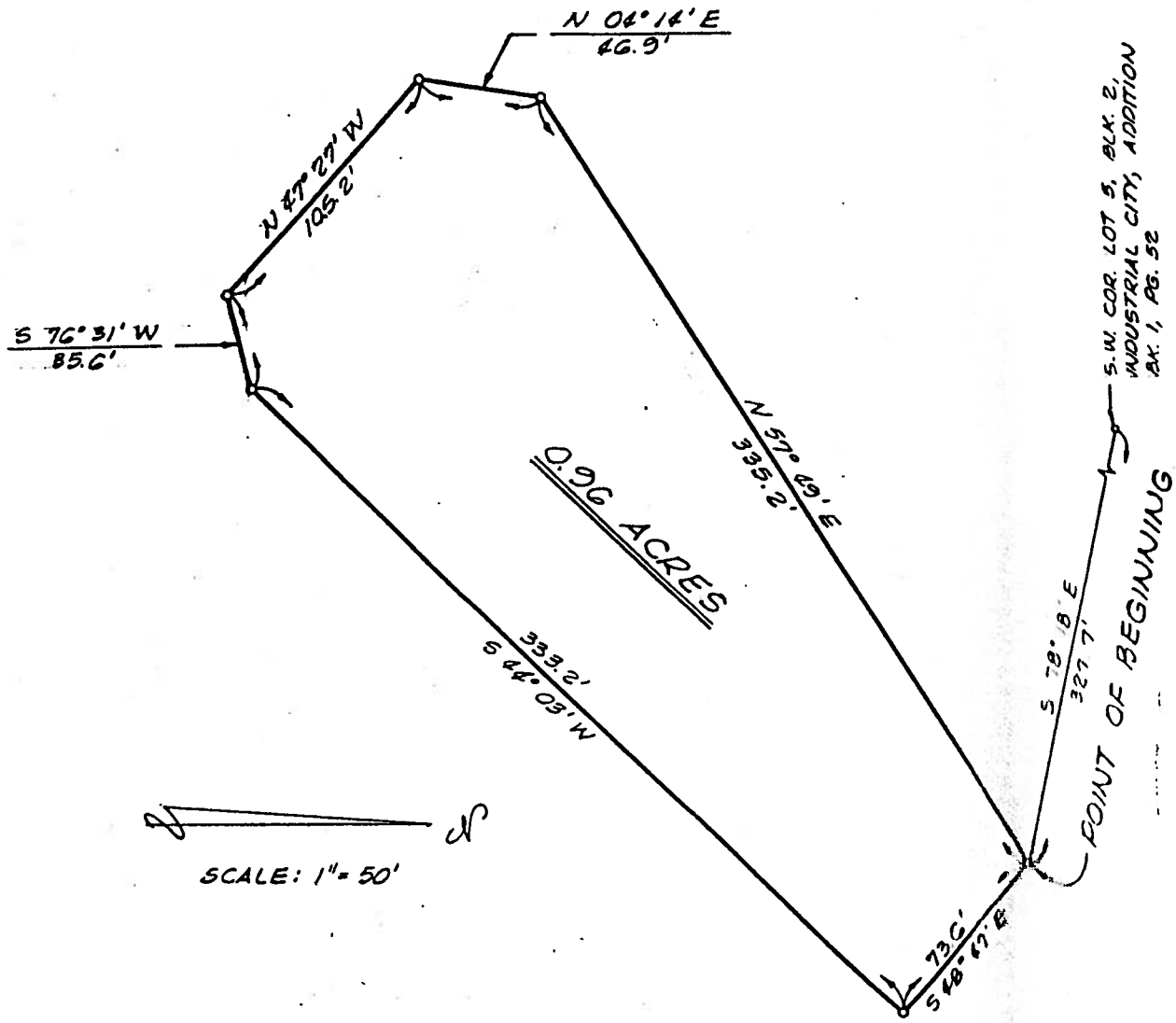
By A.L. Martin

A.L. Martin, Vice President

STATE OF OKLAHOMA)
) SS
COUNTY OF OKLAHOMA)

On the 1st day of June, 1987, personally appeared before me A.L. Martin, who, being by me duly sworn, did say, that he is the Vice President of Kerr-McGee Chemical Corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws, and said Don Hager, Assistant Secretary, acknowledged to me that said corporation executed same.

8.17.41 Faculty Rd Hobart P.O. Box 25861 Oklahoma City OK 73125



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Run thence North 57 deg
OF BEGINNING, containin
situated in the SW 1/4
County, Mississippi.

10

STATE OF MISSISSIPPI, County of Lowndes

I, Charles J. Younger, Chancery Clerk
record on the 8th day of June
recorded in Land Deed record NO. 856

Given under my hand and seal of office at
June, 19 87

By Lisa Y. [illegible]
Deputy Clerk

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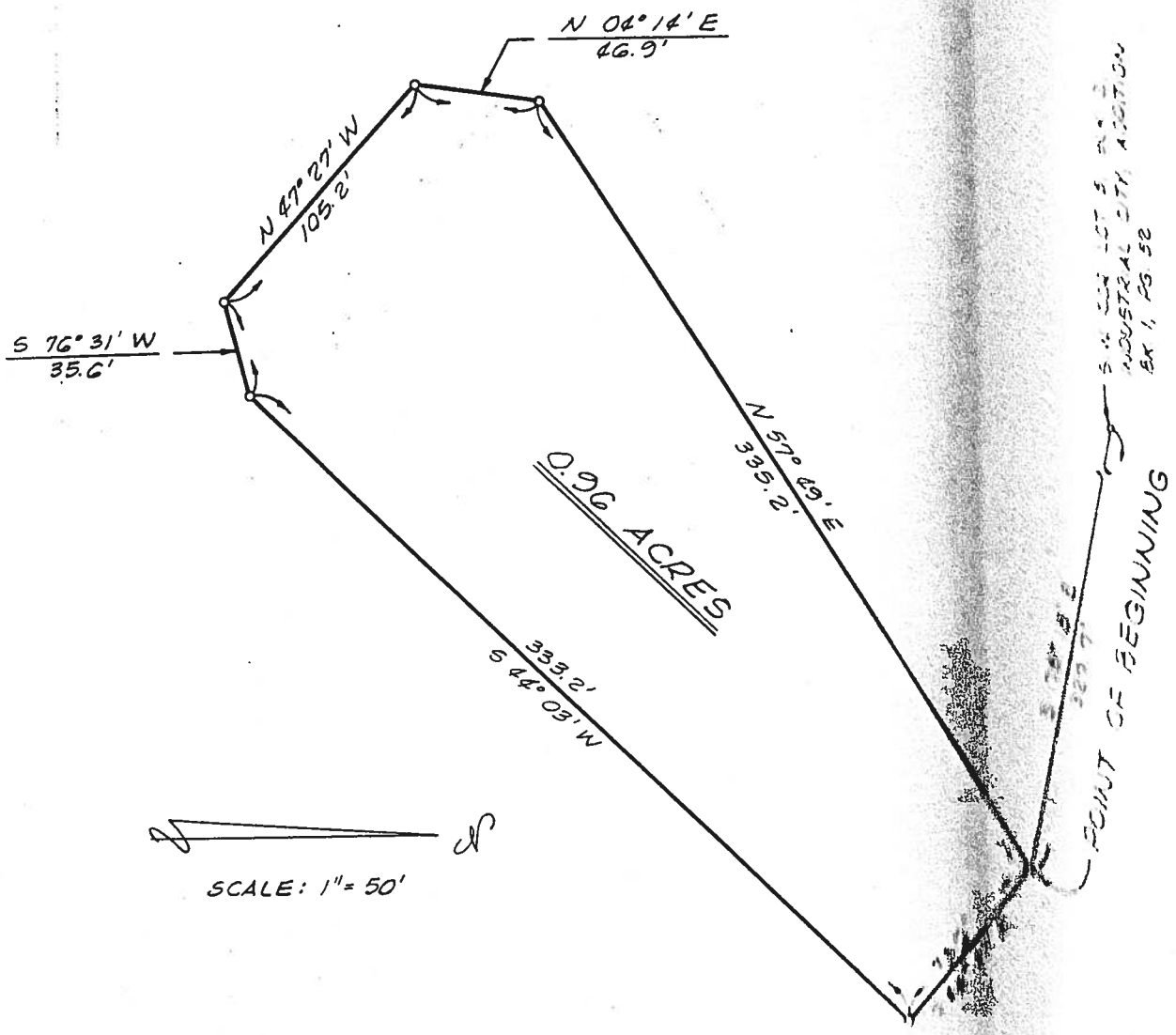
PREPARED BY:
OLIVER MITCHELL & ASSOCIATES, INC.
CONSULTING ENGINEERS
COLUMBUS, MISSISSIPPI
FEBRUARY 16, 1987

O. M. MITCHELL
Registered
Land
Surveyor
LS-2247
STATE OF MISSISSIPPI



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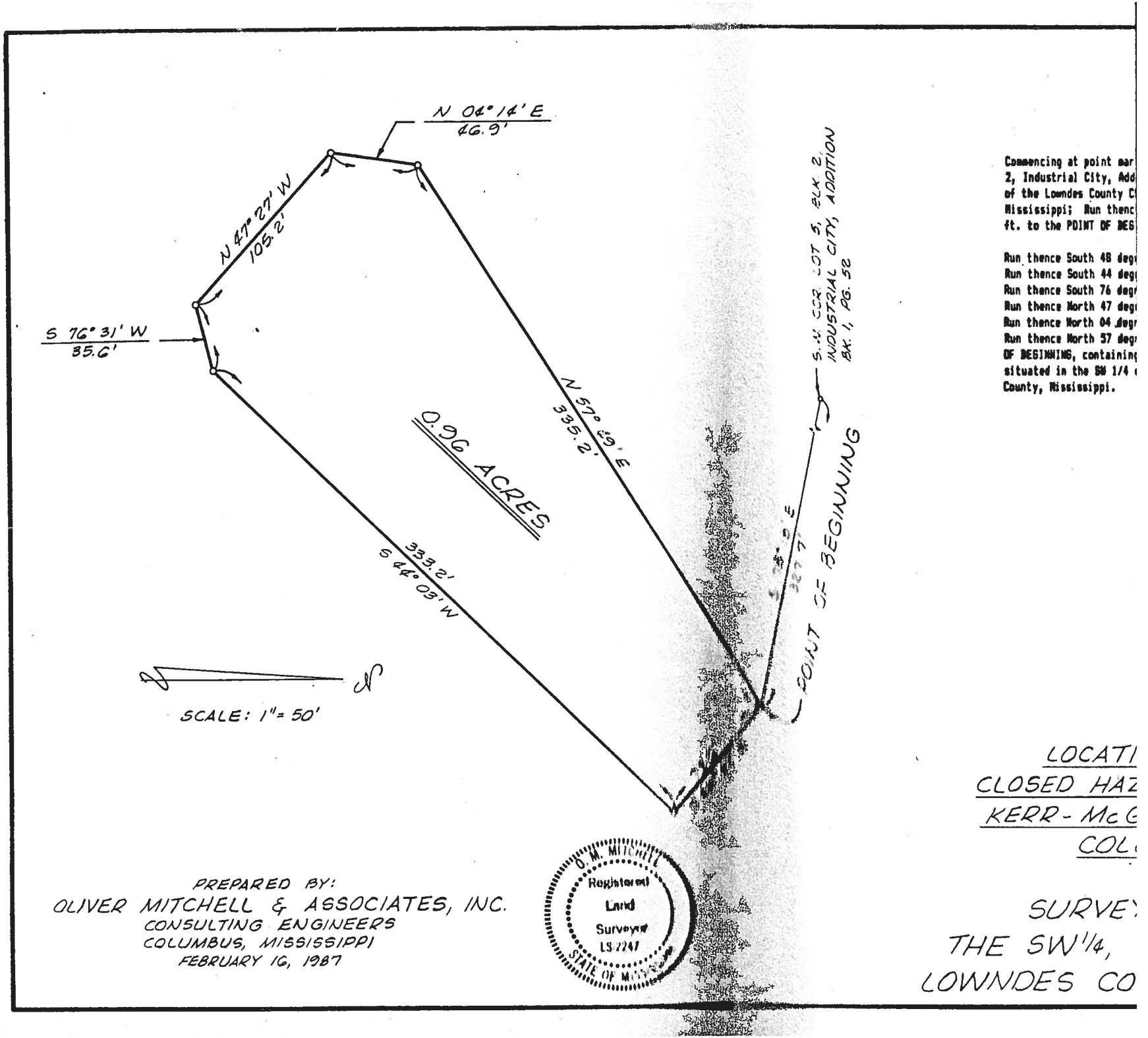

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situated in the SW 1/4
County, Mississippi.

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CONSULTING ENGINEERS
COLUMBUS, MISSISSIPPI
FEBRUARY 16, 1987

O. M. MITCHELL
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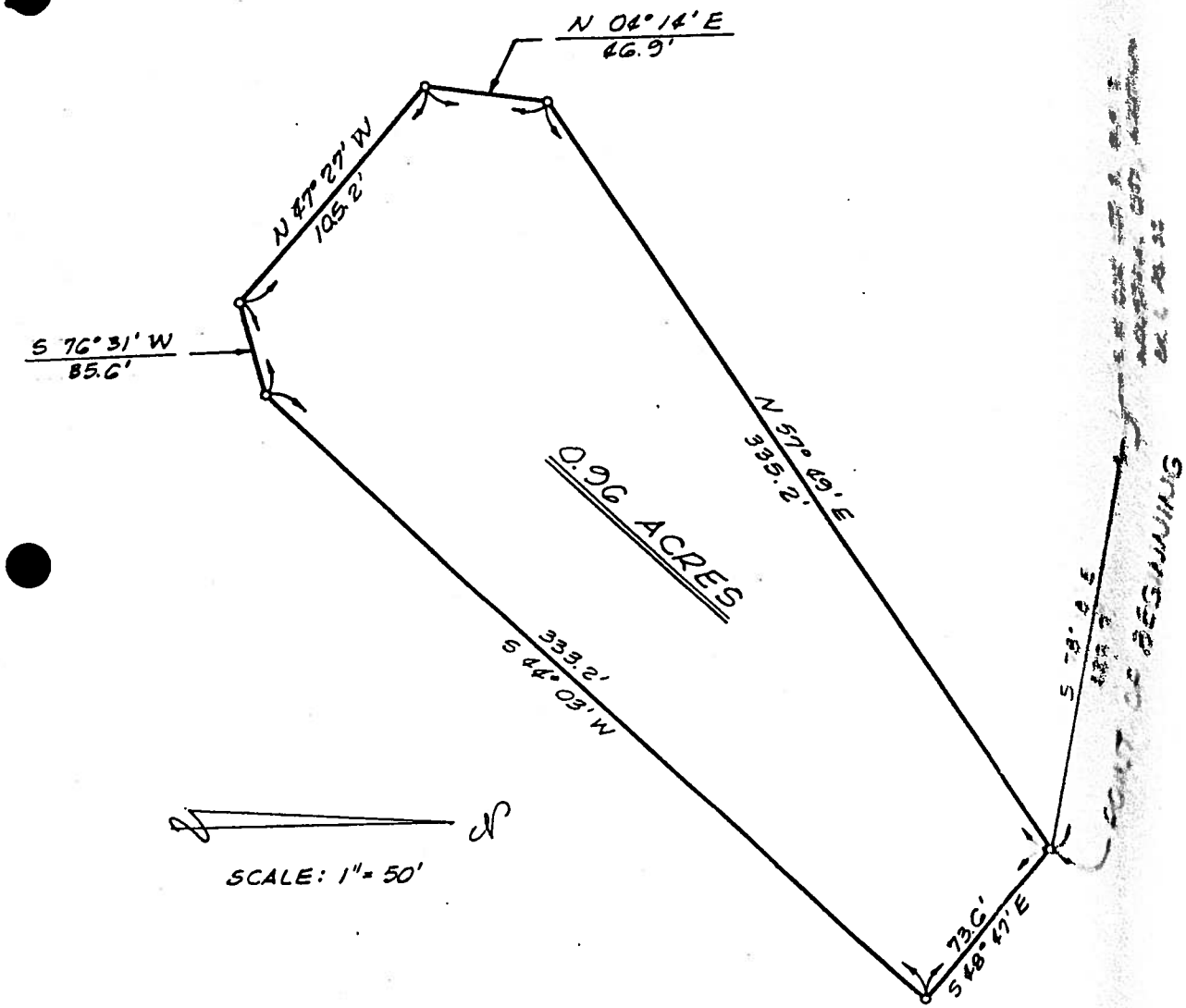

PREPARED BY:
OLIVER MITCHELL & ASSOCIATES, INC.
CONSULTING ENGINEERS
COLUMBUS, MISSISSIPPI
FEBRUARY 16, 1987

O. M. MITCHELL
Registered
Land
Surveyor
LS-2247
STATE OF MISSISSIPPI

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Run thence North 47 degrees 27 minut
Run thence North 04 degrees 14 minut
Run thence North 57 degrees 49 minut
OF BEGINNING, containing 0.96 acres,
situated in the SW 1/4 of Section 10
County, Mississippi.

10

STATE OF MISSISSIPPI, County of Lowndes:

I, Charles J. Younger, Chancery Clerk of Said Co
record on the 8th day of June
recorded in Land Deed record NO. 856 page 31

Given under my hand and seal of office at Columbus,
June, 19 87

By Lisa Y. Neese
Deputy Clerk

LOCATION S
CLOSED HAZARDOU
KERR-McGEE C
COLUMBU

SURVEY OF
THE SW1/4, SEC.
LOWNDES COUNTY

F.M Col HW

INTERNAL CORRESPONDENCE

CORP. - REMD
(UNIT)

TO David Farris, MT-1206 DATE March 19, 1987

FROM Gene H. Holmes SUBJECT Columbus, Miss.

As requested, the Waste disposal site designation has been recorded and filed by the Lowndes County Chancery office.

The attached copy is for your records. Real Estate will maintain the original document unless instructed otherwise.

Please contact me if we may be of further service.

G. H. Holmes

Gene H. Holmes

GHH:lla
Attachment
cc: J. Bull, MT-1206

JHB- File: Coal HW 9

RECEIVED
JUL 27 1990

INTERNAL CORRESPONDENCE

KM-814

KMCC-FPD
(UNIT)
Columbus, MS

TO Nick Bock

FROM John Getz

DATE

SUBJECT Public Notice

The below listed public notice was published in our local newspaper The Commercial Dispatch, Tuesday, July 17, 1990.

PUBLIC NOTICE
Mississippi Environmental Quality
Permit Board
P.O. Box 10385
Jackson, Mississippi 39289-0385
Telephone No. (601) 961-5171

PUBLIC NOTICE NO. HW - 90-009
NOTICE OF PROPOSED ISSUANCE OF A Hazardous Waste Post-Closure Permit
Resource Conservation and Recovery Act
Mississippi Solid Waste Disposal Act

Kerr-McGee Chemical Corporation, Forest Product Division, Columbus, Mississippi, has applied to the Mississippi Environmental Quality Permit Board for a Post-Closure Permit for its facility located at 14th Avenue North, Columbus, Mississippi.

The staff of the Permit Board believes that, with proper constraints and limitations proposed within the proposed permit, this project will operate within all State and Federal hazardous waste laws and standards and will protect health and the environment. Therefore, the staff of the Permit Board has preliminarily decided, based upon available information, to recommend to the Board that a permit be issued containing numerous regulatory constraints specifically stated in the draft permit. However, before proceeding further with the staff evaluation, public comments are being solicited. The staff recommendation to the Board, as well as the Board's decision, will be made only after a thorough consideration of all public comments.

Persons wishing to comment upon or object to the proposed determination are invited to submit comments in writing to Mr. Steve Spengler at the above Permit Board address, no later than September 4, 1990. All comments received prior to that day will be considered in the formulation of final determinations regarding the application. A hearing will not be held on this permit action, unless specifically requested in writing by the commenter. The Permit Board is limited in the scope of its analysis to environmental impact. Any comments relative to zoning or economic and social impacts are within the jurisdiction of local zoning and planning authorities and should be addressed to them.

FACT SHEET

Kerr-McGee Chemical Corporation
Forest Products Division
Columbus, Mississippi

PERMIT ISSUANCE

EPA I.D. No. MSD990866329

Background

This fact sheet is prepared in accordance with Mississippi Hazardous Waste Management Regulations (MHWMR) Section 124.8. The purpose of this fact sheet is to set forth factual, legal, methodological, and policy questions considered in issuing the permit application submitted by Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi (hereinafter referred to as the Permittee).

Facility Description

The Kerr-McGee Chemical Corporation, Forest Products Division (KMCC) facility is located in Lowndes County, Mississippi, northeast of Columbus. The facility consists of approximately 90 acres. Land use surrounding the facility is primarily residential and industrial. There are residences within 500 feet from the facility. The surface water body closest to the facility is Luxapalila Creek, approximately one mile to the east.

The facility has functioned as a wood preserving facility since 1928 but was not acquired by KMCC until 1964. KMCC uses a creosote solution to treat railroad ties, switch ties, crossings and pilings. Pentachlorophenol was also used as a preservative prior to 1976.

On January 27, 1981, KMCC submitted a Part A Permit application to the U.S. EPA for the operation of an Aeration Impoundment, a Sedimentation Impoundment and 4 holding tanks for wastewater treatment. The two surface impoundments operated as part of the wastewater treatment process and were used to manage hazardous waste designated as K001 wastes. K001 wastes are defined in MHWMR Part 261 as "bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and pentachlorophenol". The facility closed the units on June 18, 1986, in accordance with the closure plan approved by the mississippi Department of Environmental Quality (MDEQ). Following closure, KMCC conducted a sampling program to detect residual contamination. The analytical results indicated that clean closure was not accomplished and a post-closure permit application was submitted to the MDEQ on March 12, 1987.

In September, 1987, KMCC notified the MDEQ that dissolved K001 constituents had been detected in monitoring well CMW-4, downgradient from the closed impoundments. A groundwater assessment program was approved by the MDEQ in February of 1988 and a subsequent assessment program was initiated through Administrative Order No. 1636-89 in September of 1989. As a result of

these assessments, two contaminant plumes have been identified. One is associated with the production process and possibly the former surface impoundments. The second is in an area of a former below-ground level railroad tie loading dock. This permit addresses onsite contamination from the production area and former surface impoundments as well as outlines provisions for post-closure care of the closed impoundments. The permit also provides a mechanism to address the contaminant plume from the below-ground loading dock and any off-site contamination identified. As information becomes available pursuant to Compliance Order 1630-89, this permit will be modified to include complete on-site and off-site corrective action.

Hazardous Waste Characterization

The following hazardous wastes or hazardous waste constituents are documented to have been disposed of in the lagoons and/or may have entered the groundwater at the facility:

Hazardous Waste	Waste Code	Characteristic
Creosote and Pentachlorophenol	K001	Listed (Toxic)
Benzene	F005	Listed (Toxic)
m-xylene	F003	Listed (Toxic)
o/p-xylene	F003	Listed (Toxic)

Procedures for Permit Issuance

As described in the public notice, persons interested in commenting on this permit should submit written comments to:

Mr. Steve Spengler
Mississippi Department of Environmental Quality
Bureau of Pollution Control
Hazardous Waste Division
P.O. Box 10385
Jackson, Mississippi 39289-0385

This permit shall be issued in conformance with MHWMR 270 and 124. The comment period for this permit begins on _____ and ends on _____. A hearing will be scheduled if the Permit Board finds a significant degree of public interest. If a hearing is held, all comments will be considered by the Permit Board before final disposition of the draft permit modification is made. Public participation in the permit process is encouraged. For additional information, please contact Mr. Stephen Spengler at (601) 961-5171.

Basis for Draft Permit Conditions

The following discussion is a summary of the basis for the conditions of the permit. This discussion is organized such that the reviewer may cross reference conditions of the permit to this discussion.

MODULE I - GENERAL PERMIT CONDITIONS

The standard conditions for the permit are taken directly from MHWMR Parts 270 and 264.

MODULE II - GENERAL FACILITY CONDITIONS

A. Authorized Activities

This condition describes general activities to be conducted by the Permittee under conditions of the permit.

B. Hazardous Waste from Off-site Sources

The Permittee is prohibited from receiving waste from an off-site source.

C. Waste Analysis

The Permittee is required to analyze waste sludge generated by the facilities wastewater treatment process.

D. Personnel Training

The Permittee is required to comply with MHWMR 264.16 and conduct a program of personnel training.

E. Preparedness and Prevention

The Permittee is required to comply with MHWMR 264.32 and 264.33.

F. Contingency Plan

The Permittee shall maintain and carry out the provisions of the facility's Contingency Plan as necessary and shall comply with MHWMR 264, Subpart D, Contingency Plan and Emergency Procedures.

G. Bookkeeping and Reporting

The Permittee is required to comply with MHWMR 264.73 and 264.75.

H. General Closure Requirements

The Permittee certified closure of the surface impoundments July 7, 1986.

MODULE III - POST-CLOSURE CARE

A. Unit Identification

The Permittee is required to conduct post-closure care for the unit identified and described in Attachment III-1.

B. Post-closure Procedures and Use of Property

The Permittee is required to conduct post-closure care in accordance with MHWMR 264.117, 264.118 and 264.228.

C. Inspections

The Permittee shall perform inspections in accordance with the Inspection Schedule, Permit Attachment III-1, and MHWMR 264.117.

D. Notices and Certification

The Permittee is required to comply with MHWMR 264.117(6), 264.119(c) and 264.120.

E. Cost-estimate for Facility Post-closure

The Permittee shall comply with the requirements of MHWMR 264.142 and 264.144.

F. Financial Assurance

The Permittee shall maintain financial assurance during post-closure care as specified by MHWMR 264.145.

G. Post-closure Permit Modifications

The Permittee is required to comply with MHWMR 264.118(d).

MODULE IV - GROUNDWATER MONITORING AND EVALUATION OF THE UPPER SATURATED ZONE

A. Module Highlights

This condition describes the geological and hydrological basis for requiring groundwater monitoring and corrective action.

B. Monitoring and Corrective Action Program

The Permittee is required to conduct corrective action and groundwater monitoring activities pursuant to MHWMR 264.91(a)(3).

C. Groundwater Monitoring System

This condition designates groundwater monitoring wells as "compliance", "effectiveness", "upgradient", "boundary control", and "Deep" or Eutaw monitoring wells. It also specifies well location, and well construction techniques and sets procedures for adding or deleting monitoring wells to or from the system.

D. Groundwater Protection Standard

This Condition defines the groundwater protection standard (GWPS) for the facility.

E. Groundwater Concentration Limits

The GWPS concentration limits are established by this condition.

F. Monitoring Program and Data Evaluation

The Permittee is required to determine groundwater quality, groundwater surface elevations, groundwater flow rate and direction, and to collect and analyze samples by approved methods.

G. Recordkeeping and Reporting

The Permittee is required to enter all monitoring data into the facility operating record, to report semi-annually on the effectiveness of the corrective action program and to submit analytical results according to the specified schedule.

H. Corrective Action

The Permittee is required to perform on-site and off-site corrective action activities for groundwater contamination.

I. Modifications

This Condition establishes a procedure for modifying the Permit when it is determined that corrective action measures are no longer effective or when the GWPS has not been exceeded for a period of three (3) executive years.

PUBLIC NOTICE

Mississippi Environmental Quality
Permit Board
P. O. Box 10385
Jackson, Mississippi 39289
(601) 961-5171

PUBLIC NOTICE NO. HW-90-005
NOTICE OF PROPOSED ISSUANCE OF A PERMIT
Under the Resource Conservation and Recovery Act
The Mississippi Solid Waste Disposal Act.

Kerr-Mcgee Chemical Corporation, Forest Products Division (KMCC-FPD), has submitted an application to the Mississippi Department of Environmental Quality for a post-closure and corrective action permit for its closed hazardous waste surface impoundments at its facility located in Columbus, Mississippi. The Permit Board, after reviewing the application and pertinent standards and regulations contained within Rules 264 and 270 of the Mississippi Hazardous Waste Regulations, has tentatively determined that a permit should be issued.

Persons wishing to comment upon the Board's tentative decision are invited to submit comments in writing to Mr. Stephen Spengler at the Permit Board's address no later than August 15, 1990. All comments received prior to that day will be considered in the formulation of a final decision to issue the permit.

A copy of the draft permit, the statement of basis supporting the permit conditions therein, and the permit application submitted by KMCC-FPD are available for public inspection at the following locations:

Bureau of Pollution Control
2380 Highway 80 West
Jackson, Mississippi 39209

U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365
(404) 347-7554
Office Hours: 8:00 a.m. to 5:00 p.m.

Columbus Public Library
314 N. 7th Street
Columbus, MS 39701
(601) 329-5300

Office Hours:	Monday - Thursday	9:00 a.m. - 8:00 p.m.
	Friday	9:00 a.m. - 5:00 p.m.
	Saturday	9:00 a.m. - 3:00 p.m.

The Permit Board is limited in the scope of its analysis to environmental impact. Any comments relative to zoning or economic and social impacts are within the jurisdiction of local zoning and planning authorities and should be addressed to them.

A hearing will not be held on this permit action, unless specifically requested in writing by a commenter. The nature of the issues proposed to be raised in the hearing must be stated. If a hearing is requested, the Board will issue another Public Notice, and allow at least thirty (30) days notice of any such hearing.

Additional details about the application and the proposed determination and a copy of the draft permit are available by writing or calling Mr. Stephen Spengler at the Permit Board's address and telephone number shown above.

Please bring the foregoing to the attention of persons whom you know will be interested.

TH-23:lr

INTERNAL CORRESPONDENCE

RISK MGMT. (UNIT)	**TO** Steve Ladner **DATE** March 31, 2000 **FROM** Stacy Roberts **SUBJECT** Financial Assurance Filings Stacy

Attached you will find copies of the financial assurance documents which were sent to the appropriate state agencies for the sites listed below:

Kerr-McGee Chemical LLC
Columbus, MS
Springfield, MO
Madison, IL
Texarkana, TX

These filings are required to be submitted on an annual basis.

Please call me at x3132 if you have any questions.

sr/attachments

KERR-McGEE CHEMICAL LLC
KERR-McGEE CENTER • P.O. BOX 25861 • OKLAHOMA CITY, OKLAHOMA 73125

March 27, 2000

FEDERAL EXPRESS

Executive Director
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
P. O. Box 10385
2380 Hwy. 80 West
Jackson, Mississippi 39204

Dear Executive Director:

I am the chief financial officer of Kerr-McGee Chemical LLC, Kerr-McGee Center, Oklahoma City, Oklahoma 73125. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and post-closure care as specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265.

The firm identified above is the owner or operator of the following facilities for which liability coverage for both sudden and non-sudden accidental occurrences is being demonstrated through the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265: NONE

The firm identified above guarantees, through the guarantee specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265, liability coverage for both sudden and non-sudden accidental occurrences at the following facilities owned or operated by the following: NONE. The firm identified above is the direct or higher-tier parent corporation of the owner or operator.

1. The firm identified above owns or operates the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES Closure	 Post Closure	 Corrective Action
MSD 990866329 Kerr-McGee Chemical LLC 607 14th Street, North Columbus, MS 39701	N/A	$180,122	$721,627
MSD 081387730 Kerr-McGee Chemical LLC Highway 11 South P.O. Box 789 Meridian, MS 39301	N/A	411,791	256,288

2. The firm identified above guarantees, through the guarantee specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265, the closure and post-closure care or liability coverage of the following facilities owned or operated by the guaranteed party. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility: NONE

3. In States where the DEQ is not administering the financial requirements of Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265, this firm is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES Closure	 Post Closure	 Corrective Action
NVD 008290330 Kerr-McGee Chemical LLC P.O. Box 55 Henderson, NV 89015	N/A	$443,745	N/A
MOD 007128978 Kerr-McGee Chemical LLC P.O. Box 6208 2300 Oakland Kansas City, MO 64126	N/A	1,374,834	$497,350
ILD 020367561 Kerr-McGee Chemical LLC P.O. Box 166 Madison, IL 62060	N/A	934,011	N/A
MOD 007129408 Kerr-McGee Chemical LLC 2800 W. High Street Springfield, MO 65803	N/A	1,468,485	208,426
IDD 041310707 Kerr-McGee Chemical LLC P.O. Box 478 Soda Springs, ID 83276 (CERCLA)	N/A	N/A	1,000,000
TXD 057111403 Kerr-McGee Chemical LLC Texarkana, TX 75501 Texas Reg. #31002	N/A	909,010	1,737,730

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care is not demonstrated either to the EPA or a State through the financial test or any other financial assurance mechanisms specified in Subpart H of the Mississippi Hazardous Waste Regulations Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE

5. This firm is the owner or operator of the following UIC facilities for which financial assurance for plugging and abandonment is required under 40 CFR Part 144. The current closure cost estimates required by 40 CFR 144.62 are shown for each facility: NONE

This firm is not required to file a Form 10K with the Securities and Exchange Commission for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 1999.

	ALTERNATIVE I (Thousands of Dollars)		
1	Sum of current closure and post-closure cost estimates (Total of all cost estimates listed above.)	$ 10,143	
2	Amount of annual aggregate liability coverage to be demonstrated	$ 8,000	
3	Sum of lines 1 and 2	$ 18,143	
* 4	Total liabilities (If any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6)	$324,886	
* 5	Tangible Net Worth	$593,790	
* 6	Net Worth	$596,487	
* 7	Current Assets	$250,963	
* 8	Current Liabilities	$ 66,706	
* 9	Net Working Capital (Line 7 minus Line 8)	$184,257	
*10	The sum of net income plus depreciation, depletion and amortization	$ 90,517	
*11	Total assets in U.S. (required only if less than 90% of assets are located in U.S.)	$768,961	
		YES	NO
12	Is line 5 at least $10 million?	X	
13	Is line 5 at least 6 times line 3?	X	
14	Is line 9 at least 6 times line 3?	X	
*15	Are at least 90% of assets located in the U.S.? (If not, complete line 16)		X
16	Is line 11 at least 6 times line 3?	X	
17	Is line 4 divided by line 6 less than 2.0?	X	
18	Is line 10 divided by line 4 greater than 0.1?	X	
19	Is line 7 divided by line 8 greater than 1.5?	X	

I hereby certify that the wording of this letter is substantially identical to the wording specified in Subpart H of the Mississippi Hazardous Waste Regulations as such regulations were constituted on the date shown immediately below.

March 27, 2000
Date

Robert M. Wohleber, Senior Vice President &
Chief Financial Officer

ARTHUR ANDERSEN

Report of Independent Public Accountants

To the Management of
Kerr-McGee Chemical LLC:

We have audited, in accordance with auditing standards generally accepted in the United States, the financial statements of Kerr-McGee Chemical LLC (the "Company") for the year ended December 31, 1999, and have issued our report thereon dated March 24, 2000. We have not performed any auditing procedures since that date.

We have performed the procedures enumerated below, which were agreed to by management of the Company and the Mississippi Department of Environmental Quality, solely to assist you with respect to demonstrating compliance with the financial test for liability of the Mississippi Department of Environmental Quality. This engagement to apply agreed-upon procedures was performed in accordance with standards established by the American Institute of Certified Public Accountants. The sufficiency of the procedures is solely the responsibility of the specified users of the report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

At your request, we have read the letter dated March 27, 2000, from your chief financial officer to the Mississippi Department of Environmental Quality and compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements for the year ended December 31, 1999, referred to above, with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data in your chief financial officer's letter should be adjusted.

We were not engaged to, and did not, perform an audit, the objective of which would be the expression of an opinion on the information described above. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the use of the specified users listed above and should not be used by those who have not agreed to the procedures and taken responsibility for the sufficiency of the procedures for their purposes.

Arthur Andersen LLP

Oklahoma City, Oklahoma
March 27, 2000

KERR-McGEE CHEMICAL LLC
KERR-McGEE CENTER • P.O. BOX 25861 • OKLAHOMA CITY, OKLAHOMA 73125

March 27, 2000

FEDERAL EXPRESS

Director
MISSOURI DEPARTMENT OF NATURAL RESOURCES
Hazardous Waste Program
1738 E. Elm Street
Jefferson City, MO 65101

Dear Director:

I am the chief financial officer of Kerr-McGee Chemical LLC, Kerr-McGee Center, Oklahoma City, Oklahoma 73125. This letter is in support of this firm's use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in 10 CSR 25-7.264 and 265.

The firm identified above is the owner/operator of the following facilities for which liability coverage for both sudden and non-sudden accidental occurrences is being demonstrated through the financial test specified in 10 CSR 25-7.264 and 265: NONE

The firm identified above guarantees, through the guarantee specified in 10 CSR 25-7.264 and 265, liability coverage for both sudden and non-sudden accidental occurrences at the following facilities owned or operated by the following: NONE

1. The firm identified above owns or operates the following facilities in Missouri for which financial assurance for closure or post-closure care or liability coverage is demonstrated through the financial test specified in 10 CSR 25-7.264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES Closure	Post Closure	Corrective Action
MOD 007128978 Kerr-McGee Chemical LLC 2300 Oakland (P.O. Box 6208) Kansas City, MO 64126	N/A	$1,374,834	$497,350
MOD 007129408 Kerr-McGee Chemical LLC 2800 W. High Street Springfield, MO 65803	N/A	1,468,485	208,426

2. This firm guarantees, through the corporate guarantee specified in 10 CSR 25-7.264 and 265, the closure or post-closure care or liability coverage of the following facilities owned or operated by the guaranteed party. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility: NONE

3. In all other States, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in 10 CSR 25-7.264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES Closure	Post Closure	Corrective Action
MSD 990866329 Kerr-McGee Chemical LLC 607 14th Street, North Columbus, MS 39701	N/A	$180,122	$721,627
MSD 081387730 Kerr-McGee Chemical LLC Highway 11 South P.O. Box 789 Meridian, MS 39301	N/A	411,791	256,288
NVD 008290330 Kerr-McGee Chemical LLC P.O. Box 55 Henderson, NV 89105	N/A	443,745	N/A
ILD 020367561 Kerr-McGee Chemical LLC P.O. Box 166 Madison, IL 62060	N/A	934,011	N/A
IDD 041310707 Kerr-McGee Chemical LLC P.O. Box 478 Soda Springs, ID 83276 (CERCLA)	N/A	N/A	1,000,000
TXD 057111403 Kerr-McGee Chemical LLC Texarkana, TX 75501 Texas Reg. #31002	N/A	909,010	1,737,730

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated either to the EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE

5. This firm is the owner or operator of the following UIC facilities for which financial assurance for plugging and abandonment is required under Part 144 and is assured through a financial test. The current closure cost estimates as required by 40 CFR 144.62 are shown for each facility: NONE

This firm is not required to file a Form 10K with the Securities and Exchange Commission for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statement for the latest completed fiscal year ended December 31, 1999.

ALTERNATIVE I (Thousands of Dollars)			
1	Sum of current closure and post-closure cost estimates (Total of all cost estimates listed above.)	$ 10,143	
2	Amount of annual aggregate liability coverage to be demonstrated	$ 8,000	
3	Sum of lines 1 and 2	$ 18,143	
* 4	Total liabilities (If any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6)	$324,886	
* 5	Tangible Net Worth	$593,790	
* 6	Net Worth	$596,487	
* 7	Current Assets	$250,963	
* 8	Current Liabilities	$ 66,706	
* 9	Net Working Capital (Line 7 minus Line 8)	$184,257	
*10	The sum of net income plus depreciation, depletion and amortization	$ 90,517	
*11	Total assets in U.S. (required only if less than 90% of assets are located in the U.S.)	$768,961	
		YES	NO
12	Is line 5 at least $10 million?	X	
13	Is line 5 at least 6 times line 3?	X	
14	Is line 9 at least 6 times line 3?	X	
*15	Are at least 90% of assets located in the U.S.? (If not, complete line 16)		X
16	Is line 11 at least 6 times line 3?	X	
17	Is line 4 divided by line 6 less than 2.0?	X	
18	Is line 10 divided by line 4 greater than 0.1?	X	
19	Is line 7 divided by line 8 greater than 1.5?	X	

I hereby certify that the wording of this letter is substantially identical to the wording specified in 10 CSR 25-7.264 and 265 as such regulations were constituted on the date shown immediately below.

March 27, 2000
Date

Robert M. Wohleber, Senior Vice President &
Chief Financial Officer

ARTHUR ANDERSEN

Report of Independent Public Accountants

To the Management of
Kerr-McGee Chemical LLC:

We have audited, in accordance with auditing standards generally accepted in the United States, the financial statements of Kerr-McGee Chemical LLC (the "Company") for the year ended December 31, 1999, and have issued our report thereon dated March 24, 2000. We have not performed any auditing procedures since that date.

We have performed the procedures enumerated below, which were agreed to by management of the Company and the Missouri Department of Natural Resources, solely to assist you with respect to demonstrating compliance with the financial test for liability of the Missouri Department of Natural Resources. This engagement to apply agreed-upon procedures was performed in accordance with standards established by the American Institute of Certified Public Accountants. The sufficiency of the procedures is solely the responsibility of the specified users of the report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

At your request, we have read the letter dated March 27, 2000, from your chief financial officer to the Missouri Department of Natural Resources and compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements for the year ended December 31, 1999, referred to above, with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data in your chief financial officer's letter should be adjusted.

We were not engaged to, and did not, perform an audit, the objective of which would be the expression of an opinion on the information described above. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the use of the specified users listed above and should not be used by those who have not agreed to the procedures and taken responsibility for the sufficiency of the procedures for their purposes.

Arthur Andersen LLP

Oklahoma City, Oklahoma
March 27, 2000

LETTER FROM CHIEF FINANCIAL OFFICER

(To demonstrate liability coverage and/or to demonstrate both liability coverage and assurance of closure and/or post-closure care.)

Director
Illinois Environmental Protection Agency
[illegible] Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

Dear Sir or Madam:

I am the chief financial officer of Kerr-McGee Chemical LLC
Kerr-McGee Center, Oklahoma City, OK 73125 (1).

This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and post-closure care (2) as specified in Subpart H of 35 Ill. Adm. Code Parts 724 and 725.

The firm identified above is the owner or operator of the following facilities for which liability coverage for sudden and non-sudden (3) accidental occurrences is being demonstrated through the financial test specified in Subpart H of 35 Ill. Adm. Code 724 and 725.

Please attach a separate page if more space is needed for all facilities.

USEPA I.D. No. ILD 020367561 (4)

Name Kerr-McGee Chemical LLC (5)

Address P.O. Box 166 (S. End of Washington St.) (6)

City Madison Illinois 62060 (7)

The firm identified above guarantees, through the guarantee specified in Subpart H of 35 Ill. Adm. Code Parts 724 and 725, liability coverage for N/A (8) accidental occurences at the following facilities owned or operated by the following:

USEPA I.D. No. _____ (4)

Name _____ (5)

Address _____ (6)

City _____ (7)

USEPA I.D. No. _____ (4)

Name _____ (5)

Address _____ (6)

City _____ (7)

The Agency is authorized to require, pursuant to Illinois Compiled Statutes, 1994, Chapter 45, Act 5, Section 21(f)(as amended) that this information be submitted to the Agency by any person conducting a waste disposal operation. Failure to provide this information or falsification of this information may result in [illegible] penalty of not to exceed $10,000 and an additional civil penalty not to exceed $1,000 per day of violation, and a fine not to exceed $1,000 and [illegible]sonment up to one year. This form has been approved by the Forms Management Center.

IL 532 1602
LPC 261 Rev. Dec-96

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3. In states where IEPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this firm is demonstrating financial assurance for the closure or post closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure or post closure cost estimates covered by such a test are shown for each facility:

(Please attach a separate page if more space is needed.)

		Corr. Action	Closure Amount	Post Closure Amount	Closure and Post Closure Amount
USEPA I.D. No. (4)	MSD 990866329				
Name (5)	Kerr-McGee Chemical LLC	$721,627	N/A	$180,122	$901,749
Address (6)	607 14th Street, North			(10)	
City (7)	Columbus, MS 39701				

		Corr. Action	Closure Amount	Post Closure Amount	Closure and Post Closure Amount
USEPA I.D. No. (4)	MSD 081387730				
Name (5)	Kerr-McGee Chemical LLC	$256,288	N/A	$411,791	$668,079
Address (6)	P.O. Box 789 Hwy 11 South			(10)	
City (7)	Meridian, MS 39701				

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or as a disposal facility post-closure care is not demonstrated either to IEPA, USEPA or a State through the financial test or any other financial assurance mechanisms specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure or post closure cost estimates not covered by such financial assurance are shown for each facility:

(Please attach a separate page if more space is needed.)

		Closure Amount	Post Closure Amount	Closure and Post Closure Amount
USEPA I.D. No. (4)				
Name (5)				
Address (6)			(10)	
City (7)				

		Closure Amount	Post Closure Amount	Closure and Post Closure Amount
USEPA I.D. No. (4)				
Name (5)				
Address (6)			(10)	
City (7)				

PART A. Liability Coverage for Accidental Occurrences

ALTERNATIVE I

1.	Amount of annual aggregate liability coverage to be demonstrated	$_____
*2.	Current assets	$_____
3.	Current liabilities	$_____
4.	Not working capital	$_____
*5.	Tangible net worth	$_____
*6.	If less than 90% or assets are located in the U.S., given total U.S. assets	$_____

		YES	NO
7.	Is line 5 at least $10 million?	_____	_____
8.	Is line 4 at least 6 times line 1?	_____	_____
9.	Is line 5 at least 6 times line 1?	_____	_____
*10.	Are at least 90% of assets located in the U.S.? If not complete line 11	_____	_____
11.	Is line 6 at least 6 times line 1?	_____	_____

I hereby certify that the wording of this letter is identical to the wording specified in 35 Ill. Adm. Code 724.251 as such regulations were constituted on the date shown immediately below.

Signature _____
(15)

Name _____
(16)

Title _____
(17)

Date _____
(18)

ALTERNATIVE II

1.	Amount of annual aggregate liability coverage to be demonstrated	$_____
*2.	Current bond rating of most recent issuance and Name of rating service	$_____
*3.	Date of issuance of bond	$_____
4.	Date of maturity of bond	$_____
*5.	Tangible net worth	$_____
*6.	Total assests in U.S.	$_____

		YES	NO
7.	Is line 5 at least $10 million?	_____	_____
8.	Is line 5 at least 6 times line 1?	_____	_____
9.	Are at least 90% of assets located in the U.S.? If not complete line 10	_____	_____
10.	Is line 6 at least 6 times line 1?	_____	_____

I hereby certify that the wording of this letter is identical to the wording specified in 35 Ill. Adm. Code 724.251 as such regulations were constituted on the date shown immediately below.

Signature _____
(15)

Name _____
(16)

Title _____
(17)

Date _____
(18)

ALTERNATIVE II

1.	Sum of current closure and post-closure cost estimates	$_____
2.	Amount of annual aggregate liability coverage to be demonstrated	$_____
3.	Sum of lines 1 and 2	$_____
4.	Current bond rating of most recent issuance and name of rating service	$_____
5.	Date of issuance of bond	$_____
6.	Date of maturity of bond	$_____
*7.	Tangible net worth	$_____
8.	Total assets in the U.S.	$_____

		YES	NO
9.	Is line 7 at least $10 million?	_____	_____
10.	Is line 7 at least 6 times line 3?	_____	_____
*11.	Are at least 90% of assets located in the U.S.? If not complete line 12.	_____	_____
12.	Is line 8 at least 6 times line 3?	_____	_____

I hereby certify that the wording of this letter is identical to the wording specified in 35 Ill. Adm. Code 724.251 as such regulations were constituted on the date shown immediately below.

Signature _____

Name _____

Title _____

Date _____

ts/1029k/27-29

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Springfield, IL

ATTACHMENT I

EPA Identification No. Name and Address	COST ESTIMATES Closure	Post Closure	Corr. Action	Total
MOD 007128978 Kerr-McGee Chemical LLC P. O. Box 6208 2300 Oakland Kansas City, MO 64126	N/A	$1,374,834	$497,350	$1,872,184
MOD 007129408 Kerr-McGee Chemical LLC 2800 West High Street Springfield, MO 65803	N/A	1,468,485	208,426	1,676,911
NVD 008290330 Kerr-McGee Chemical LLC P. O. Box 55 Henderson, NV 89015	N/A	443,745	N/A	443,745
IDD 04130707 Kerr-McGee Chemical LLC P.O. Box 478 Soda Springs, ID 83276 (CERCLA)	N/A	N/A	1,000,000	1,000,000
TXD 057111403 Kerr-McGee Chemical LLC 155 Buchanan Road Texarkana, TX 75501	N/A	909,010	1,737,730	2,646,740

ARTHUR ANDERSEN

Report of Independent Public Accountants

To the Management of
Kerr-McGee Chemical LLC:

We have audited, in accordance with auditing standards generally accepted in the United States, the financial statements of Kerr-McGee Chemical LLC (the "Company") for the year ended December 31, 1999, and have issued our report thereon dated March 24, 2000. We have not performed any auditing procedures since that date.

We have performed the procedures enumerated below, which were agreed to by management of the Company and the Illinois Environmental Protection Agency, solely to assist you with respect to demonstrating compliance with the financial test for liability of the Illinois Environmental Protection Agency. This engagement to apply agreed-upon procedures was performed in accordance with standards established by the American Institute of Certified Public Accountants. The sufficiency of the procedures is solely the responsibility of the specified users of the report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

At your request, we have read the letter dated March 27, 2000, from your chief financial officer to the Illinois Environmental Protection Agency and compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements for the year ended December 31, 1999, referred to above, with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data in your chief financial officer's letter should be adjusted.

We were not engaged to, and did not, perform an audit, the objective of which would be the expression of an opinion on the information described above. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the use of the specified users listed above and should not be used by those who have not agreed to the procedures and taken responsibility for the sufficiency of the procedures for their purposes.

Arthur Andersen LLP

Oklahoma City, Oklahoma
March 27, 2000

KERR-McGEE CHEMICAL LLC
KERR-McGEE CENTER • P.O. BOX 25861 • OKLAHOMA CITY, OKLAHOMA 73125

March 27, 2000

FEDERAL EXPRESS

Executive Director
TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
P. O. Box 13087
12100 Park 35 Circle
Austin, Texas 78753

Dear Executive Director:

I am the chief financial officer of Kerr-McGee Chemical LLC, Kerr-McGee Center, Oklahoma City, Oklahoma 73125. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The firm identified above is the owner or operator of the following facilities for which liability coverage for both sudden and non-sudden accidental occurrences is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265:

EPA IDENTIFICATION NO.
Name and Address

TXD 057111403
Kerr-McGee Chemical LLC
155 Buchanan Rd.
Texarkana, TX 75501
Texas Reg. #31002

The firm identified above guarantees, through the guarantee specified in Subpart H of 40 CFR Parts 264 and 265, liability coverage for both sudden and non-sudden accidental occurrences at the following facilities owned or operated by the following: NONE. The firm identified above is the direct or higher-tier parent corporation of the owner or operator.

1. The firm identified above owns or operates the following facilities for which financial assurance for closure or post-closure care or liability coverage is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimate covered by the test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES		
	Closure	Post Closure	Corrective Action
TXD 057111403 Kerr-McGee Chemical LLC 155 Buchanan Rd. Texarkana, TX 75501 Texas Reg. #31002	N/A	$909,010	$1,737,730

2. The firm identified above guarantees, through the guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post-closure care or liability coverage of the following facilities owned or operated by the guaranteed party. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility: NONE

3. In States where the EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this firm is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure or post-closure cost estimates covered by such a test are shown for each facility:

EPA IDENTIFICATION NO. Name & Address	COST ESTIMATES Closure	Post Closure	Corrective Action
MSD 990866329 Kerr-McGee Chemical LLC 607 14th Street, North Columbus, MS 39701	N/A	$180,122	$721,627
MSD 081387730 Kerr-McGee Chemical LLC Highway 11 South P.O. Box 789 Meridian, MS 39301	N/A	411,791	256,288
NVD 008290330 Kerr-McGee Chemical LLC P.O. Box 55 Henderson, NV 89015	N/A	443,745	N/A
MOD 007128978 Kerr-McGee Chemical LLC P.O. Box 6208 2300 Oakland Kansas City, MO 64126	N/A	1,374,834	497,350
ILD 020367561 Kerr-McGee Chemical LLC P.O. Box 166 Madison, IL 62060	N/A	934,011	N/A
MOD 007129408 Kerr-McGee Chemical LLC 2800 W. High Street Springfield, MO 65803	N/A	1,468,485	208,426

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanisms specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE

5. This firm is the owner or operator or guarantor of the following UIC facilities for which financial assurance for plugging and abandonment is required under Part 144 and is assured through a financial test. The current closure cost estimates required by 40 CFR 144.62 are shown for each facility: NONE

This firm is not required to file a Form 10K with the Securities and Exchange Commission for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 1999.

ALTERNATIVE I (Thousands of Dollars)			
1	Sum of current closure and post-closure cost estimates (Total of all cost estimates listed above.)	$ 9,143	
2	Amount of annual aggregate liability coverage to be demonstrated	$ 8,000	
3	Sum of lines 1 and 2	$ 17,143	
* 4	Total liabilities (If any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6)	$324,886	
* 5	Tangible Net Worth	$593,790	
* 6	Net Worth	$596,487	
* 7	Current Assets	$250,963	
* 8	Current Liabilities	$ 66,706	
* 9	Net Working Capital (Line 7 minus Line 8)	$184,257	
*10	The sum of net income plus depreciation, depletion and amortization	$ 90,517	
*11	Total assets in U.S. (required only if less than 90% of assets are located in the U.S.)	$768,961	
		YES	NO
12	Is line 5 at least $10 million?	X	
13	Is line 5 at least 6 times line 3?	X	
14	Is line 9 at least 6 times line 3?	X	
*15	Are at least 90% of assets located in the U.S.? (If not, complete line 16)		X
16	Is line 11 at least 6 times line 3?	X	
17	Is line 4 divided by line 6 less than 2.0?	X	
18	Is line 10 divided by line 4 greater than 0.1?	X	
19	Is line 7 divided by line 8 greater than 1.5?	X	

I hereby certify that the wording of this letter is substantially identical to the wording specified in 40 CFR 264.151(g) as such regulations were constituted on the date shown immediately below.

March 27, 2000
Date

Robert M. Wohleber, Senior Vice President & Chief Financial Officer

ARTHUR ANDERSEN

Report of Independent Public Accountants

To the Management of
Kerr-McGee Chemical LLC:

We have audited, in accordance with auditing standards generally accepted in the United States, the financial statements of Kerr-McGee Chemical LLC (the "Company") for the year ended December 31, 1999, and have issued our report thereon dated March 24, 2000. We have not performed any auditing procedures since that date.

We have performed the procedures enumerated below, which were agreed to by management of the Company and the Texas Natural Resource Conservation Commission, solely to assist you with respect to demonstrating compliance with the financial test for liability of the Texas Natural Resource Conservation Commission. This engagement to apply agreed-upon procedures was performed in accordance with standards established by the American Institute of Certified Public Accountants. The sufficiency of the procedures is solely the responsibility of the specified users of the report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

At your request, we have read the letter dated March 27, 2000, from your chief financial officer to the Texas Natural Resource Conservation Commission and compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements for the year ended December 31, 1999, referred to above, with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data in your chief financial officer's letter should be adjusted.

We were not engaged to, and did not, perform an audit, the objective of which would be the expression of an opinion on the information described above. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the use of the specified users listed above and should not be used by those who have not agreed to the procedures and taken responsibility for the sufficiency of the procedures for their purposes.

Arthur Andersen LLP

Oklahoma City, Oklahoma
March 27, 2000

File Loc HW GW92

RECEIVED

JUL 16 1992

KMCC-FOREST PRODUCTS DIVISION
ENVIRONMENTAL & QUALITY CONTROL

STATE OF MISSISSIPPI

DEPARTMENT OF ENVIRONMENTAL QUALITY

JAMES I. PALMER, JR.
EXECUTIVE DIRECTOR

July 10, 1992

cc: J. Poor
J. Colly

Mr. Nick Bock
Kerr-McGee Chemical Corporation
Forest Products Division
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Dear Mr. Bock:

Re: June 2, 1992
Proposed Off-Site Corrective Action
Kerr-McGee Chemical Corporation
Columbus, Mississippi

The Mississippi Office of Pollution Control (Office) has reviewed the above referenced proposal and the response to the initial comments on the proposal. The Office approves of the proposed off-site corrective action plan with the following conditions:

1) Additional groundwater monitoring wells shall be installed as follows:

   a) A boundary control well shall be installed in the area between the existing wells CMW-54 and CMW-58.

   b) A boundary control well shall be installed in the area between the existing wells CMW-63 and CMW-58.

   These wells shall be placed such that groundwater samples taken from the wells are determined to be below method detection limits for the constituents of concern.

2) Final design of the corrective action shall be such that the dissolved portion of the contamination is contained. Should the trench be placed such that this is not achieved, additional corrective measures must be proposed and submitted to the Office upon making the determination.

3. All hazardous waste generated during the installation of the corrective action system shall be handled as hazardous waste and properly disposed.

4. A description of the management of the excavated soils shall be submitted to the Office and approved prior to implementing the field activities. For example, how will saturated soils be handled to prevent the release of potentially contaminated waters to the surface?

5. The Office shall be notified two weeks prior to the implementation of field activities.

Sincerely,

Bruce Ferguson
Hazardous Waste Division

BF:cd

File C
col
Lws 92

KERR-McGEE CHEMICAL CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

August 5, 1992

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

Mr. Bruce Ferguson
Hazardous Waste Division
State of Mississippi
Department of Environmental Quality
Office of Pollution Control
P.O. Box 10385
Jackson, MS 39289-0385

Re: Kerr-McGee Chemical Corporation
Forest Products Division
Columbus, Mississippi Facility
Groundwater Corrective Action

Dear Mr. Ferguson:

Kerr-McGee Chemical Corporation, Forest Products Division (KMCC-FPD), is in receipt of your July 10, 1992 approval letter for groundwater corrective action for our Columbus, Mississippi facility. Based on this approval letter KMCC intends to:

1. Install additional groundwater monitoring wells as follows:

   a) A boundary control well shall be installed in the area between the existing wells CMW-54 and CMW-58.

   b) A boundary control well shall be installed in the area between the existing wells CMW-63 and CMW-58.

   As previously discussed, KMCC is concentrating activities on installing an offsite containment trench south of the facility and will install additional monitoring wells after the containment trench is in place. This will ensure the startup of the containment trench in as short a time period as possible and reduce the potential for well damage during the containment trench construction phase.

2. The corrective action remedy proposed has been designed to capture soluble and free phase constituents. As required by Condition IV.J.1. of Permit HW-90-329-01 for the Columbus, Mississippi facility, KMCC will propose corrective measures wherever corrective measures no longer meet the requirements under MHWMR 264.100(h).

3. Hazardous waste generated during the installation of the corrective action system shall be handled as hazardous waste and disposed of in accordance with State and Federal regulations.

4. Prior to all excavations of dewatering manholes/containment trenches, a well point system will be installed (both sides of trench) to the top of the competent Eutaw formation to dewater the alluvial formation. The area to be excavated will be fully dewatered prior to commencing excavation and remain in place until backfilling of gravel/sand has occurred. This will eliminate soils releasing contaminated groundwaters.

   During operation of the well point system, all groundwaters will be discharged to the wood treating facility for pretreatment prior to discharge to the POTW in compliance with the facility's POTW permit.

   KMCC will segregate visually contaminated soils to prevent the potential release of contamination. These soils will be placed on an impermeable barrier to prevent the potential for cross media contamination. Since the trench is located very close to the leading edge of the contaminant plume and in an area where contamination is limited to the contact of the alluvial and Eutaw formations, large quantities of contaminated soils will not be encountered.

5. KMCC awarded a contract on August 14, 1992 for the construction of the corrective action system to W. G. Yates & Sons Construction Company of Philadelphia, Mississippi. Mr. Randy Richardson of Yates Construction will be the contractor's project manager.

   A tentative implementation schedule for construction activities at Columbus is as follows:

Date	Task
Week of August 10, 1992	A. Mobilization
	B. Place orders for required materials and services such as pipe, manholes, gravel, sand, geotechnical fabric and dewatering.
Week of August 17, 1992	A. Install dewatering system and connect to the facility's pretreatment system.
	B. Dewater area
Week of August 24, 1992	Begin excavation of manholes/trenches. After dewatering complete

The contractor has estimated the total project may take approximately 80 days to complete.

I believe I have addressed all of the conditions in your July 10, 1992 approval letter for corrective action implementation at KMCC's Columbus, Mississippi facility.

Please contact John Getz, Columbus, Mississippi plant manager directly in regard to the current status of corrective action implementation or me at (405) 270-2394 with any questions you may have.

Sincerely,

KERR-McGEE CHEMICAL CORPORATION
FOREST PRODUCTS DIVISION

Nick Bock
Staff Environmental Specialist

NB:wpc

cc: J. Getz
J. Bull
R. Michel
J. Poor
R. Richardson, Yates Construction Co.
R. Widmann

COPY 7

KERR-McGEE CHEMICAL CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

February 25, 2000

Mr. Bruce Ferguson
Office of Pollution Control
2380 Highway 80 West
Jackson, Mississippi 39204

Re: Kerr-McGee Chemical Corporation -Forest Products Division
Columbus Mississippi Facility
1999 Annual / Semi-Annual Corrective Action Performance
Evaluation Report and Groundwater Monitoring Report
HW-90-329-01

Dear Mr. Ferguson:

Enclosed, please find two copies of the *1999 Annual / Semi-Annual Corrective Action Performance Evaluation and Groundwater Monitoring Report* submitted in compliance with 40 CFR Section 265.94, and as referenced in provision IV.H.11. of the Permit. The Permit requires an annual report on the groundwater monitoring program, and a semi-annual report describing the performance of the corrective action to be submitted by March 1 of each year.

If you have any questions or require additional information concerning the contents of this report, please do not hesitate to contact me at (405) 270-2625.

Sincerely,

KERR-MCGEE CHEMICAL CORP.
FOREST PRODUCT DIVISION

Stephen A. Ladner

STEPHEN A. LADNER
Staff Environmental Specialist

SL/TWR

Enclosures

cc: R. Murphey
T. Reed

FOREST PRODUCTS

1999 ANNUAL/SEMI-ANNUAL CORRECTIVE ACTION PERFORMANCE EVALUATION AND GROUNDWATER MONITORING REPORT KERR-McGEE CHEMICAL LLC FOREST PRODUCT DIVISION COLUMBUS, MISSISSIPPI

Submitted in Compliance With
Hazardous Waste Permit No. HW-90-329-01
EPA ID No. MSD 990866329

Prepared By:

Thomas W. Reed, CPG
Safety and Environmental Affairs
Kerr-McGee Corporation

March 1, 2000

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INTRODUCTION

Kerr-McGee Chemical LLC, Forest Products Division (KMCLLC) owns and operates a wood preserving facility in Columbus, Mississippi. The location of the facility is shown on Figure 1. The production process settling impoundment was closed in the summer of 1986 in accordance with a closure plan approved by the Mississippi Department of Environmental Control (MDEQ), formerly the Mississippi Bureau of Pollution Control (MBPC).

As provided by item E of the March 13, 1989 Consent Order No. 1636-89 between the KMCLLC and the Mississippi Department of Environmental Quality (MDEQ), the revised *Post-Closure Permit Application, Part B* (Kerr-McGee Corporation, 1990) was submitted on April 12, 1990. As a result of the submittal and approval of the permit application, *Hazardous Waste Permit No. HW-90-329-01* (Permit) was issued September 11, 1990, and expires September 11, 2000. A revised application for renewal of the Hazardous Waste Permit will be submitted in March of 2000.

KMCLLC negotiated the Hazardous and Solid Waste Amendments (HSWA) portion of the permit with the USEPA, however, the USEPA granted the authority to MDEQ to oversee the HSWA permit. In conjunction with the issuance of the HSWA permit, MDEQ requested a permit modification to incorporate interim corrective action measures. Both the HSWA and the permit modifications for the Hazardous Waste Permit were finalized in August 1995. The HSWA portion of the permit is effective until August 1, 2005.

KMCLLC submits this document as the *1999 Annual Groundwater Monitoring Report* as required in "Section II.G.2." of the Permit. In addition, this report also serves as the Semi-annual Corrective Action Effectiveness Report as referenced in Section IV.H.11. of the Permit which requires "semi-annual reports on the effectiveness of corrective action to be submitted on March 1 and October 1 of each year." The report contains both groundwater recovery and analytical data for the first and second half reporting period for 1999. In addition, documentation of the progress of the facility corrective action is provided.

RFI WORKPLAN

As a result of the HSWA permit, KMCLLC began the formal corrective action process with submittal of the RFI Investigation Workplan on November 28, 1995 (Kerr-McGee Chemical Corporation, 1995). This process has proceeded through the preparation and submittal of a Phase I report, a Phase II Workplan, and completion of a Phase II report which was submitted to the MDEQ in October 1998. KMCLLC received an October 1999 request from MDEQ for supplemental RFI activities specific to off-site drainage ditches. This supplemental workplan was submitted December 18, 1999.

1999 MONITOR WELL MAINTENANCE PROGRAM

In response to a November 20, 1998 request from MDEQ, KMCCLLC redeveloped monitor wells CMW3, CMW11 and CMW19 in May of 1999. Appendix A contains a table of this information. Sediment from all three wells was removed until the total depth was established. CMW19 was damaged in July of 1993 and repaired. When the pad was damaged, approximately 3.5 feet of the casing was pulled from the well bore resulting in the difference in the measured total depth verses the drilled total depth. CMW11 has a total depth of 20.85 feet below TOC; documented depth is 22.5 feet. Historical total depth measurements on this well indicate that measurable quantities of

sediment enter the well screen after re-development. Total depth of 24.0 feet was established for CMW3, after removal of two gallons of sand pack. The well integrity for these three wells is questionable and KMCCLLC will negotiate with MDEQ to plug and replace these wells.

KMCLLC-FPD proposed the plugging and abandonment of eight monitor wells that were deemed to have no further technical merit for the facility. This plan was submitted to the MDEQ in May 1999. Approval to plug seven of the eight proposed wells was granted in May of 1999. These seven wells were properly plugged and abandoned by a licensed well driller in July 1999. The appropriate decommissioning records were prepared and submitted to the Bureau of Land and Water Resources. Appendix A contains the well plugging information.

GROUNDWATER MONITORING PROGRAM

KMCLLC began the installation of a detection groundwater monitoring system at the facility in July 1981, in compliance with the groundwater monitoring requirements of the Resources Conservation and Recovery Act (RCRA) as specified in "Subpart F" of "40CFR 265.91". As of December 31, 1999, a total of thirty-seven (37) alluvial monitor wells, twenty-six (26) alluvial piezometers and five (5) Eutaw formation monitor wells are currently active for groundwater assessment purposes. In addition, fifty-nine (59) soil borings have been drilled and documented for both location and lithology and plugged to the surface. Figure 2 is a map of all well locations. Inventories of elevation and construction details for all monitor wells and piezometers are presented on Tables 1 and 2.

The groundwater corrective action monitoring program established by the Permit addresses the hazardous constituents that exceed the groundwater protection standard concentration limits. Semi-annual analyses are performed on the "groundwater compliance wells" (CMW6, CMW7, and CMW8). In addition, supplemental monitoring

of "effectiveness wells" (CMW3, CMW11, CMW19, CMW24, CMW61, and CMW66), "upgradient well" (CMW1AR), "boundary wells" (CMW14, CMW16, CMW26, CMW27, CMW51, CMW56, CMW57, CMW60 and CMW65) and "deep zone monitoring wells" in the Eutaw formation (CME3, CME5, CME6, CME7 and CME8) confirm any detected contaminant levels. The sampling summary for 1999 (Table 3) includes those wells compliant with the Permit. This sampling program includes groundwater analyses for K001 Appendix VII constituents, volatile organics (benzene and total xylene), Appendix IX constituents and total phenol. The laboratory analytical summary sheets are contained in Appendix B. New boundary monitor wells CMW28, CMW29, and CMW30 have been added to the semi-annual sampling schedule. KMCLLC-FPD is currently in the process of determining correct survey locations for CMW28 and CMW29.

Sampling is performed semi-annually by the Hydrological Field Assistant according to the revised *Sampling and Analysis Plan* (Kerr-McGee Chemical Corporation, 1996). Samples are shipped overnight air-freight in ice-packed, insulated sample shuttles to Southwest Laboratories of Oklahoma in Broken Arrow, Oklahoma for analyses. Proper chain-of-custody documentation accompanies all shipped samples. The sampling event summary sheets for 1999 are included in Appendix C.

K001 Appendix VII

Groundwater samples are analyzed for the acid and base/neutral fraction of K001 constituents (Table 4) listed in 40CFR 261, Appendix VII. These organic compounds of the Appendix VII list are the primary constituents of creosote and are therefore the most representative compounds for determining groundwater impact at this wood preserving facility.

In accordance with the Permit, all compliance wells (CMW6, CMW7, CMW8) are analyzed semi-annually for the Appendix VII K001 constituents. Boundary wells (CMW14, CMW16, CMW26, CMW27, CMW28, CMW29, CMW30, CMW51, CMW56, CMW57, CMW60 and CMW65) and the deep monitoring wells (CME3, CME5, CME6,

CME7 and CME8) are also analyzed semi-annually. Upgradient well CMW1AR is analyzed annually.

Naphthalene and acenaphthylene are the most soluble and hence the most mobile of the listed base/neutral extractable compounds. The effectiveness wells (CMW3, CMW11, CMW19, CMW24, CMW61 and CMW66) are monitored semi-annually for naphthalene and acenaphthylene. These wells are also analyzed annually for the full Appendix VII list (method 8270) during each even year rather than for the EPA Method 8100 parameters of naphthalene and acenaphthylene. When the concentration limits specified in the Permit have been reached, these wells will be sampled semi-annually for the Appendix VII acid and base/neutral compounds listed on Table 4.

Benzene, Total Xylene and Phenol Analyses

In the past, diesel and/or fuel oil were often used in some treating practices to dilute the creosote prior to wood treating. Groundwater from all monitoring wells is analyzed for benzene, total xylene and total phenol as scheduled in the permit.

Appendix IX Parameters

The permit was modified to exclude analyzing effectiveness wells for the Appendix IX parameters: non-halogenated volatile organics (Method 8015), polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (Method 8280), metals (except arsenic, chromium and lead) (Method 6010), semi-volatiles (Method 8250), cyanide (Method 9010), chlorinated herbicides (Method 8150), and mercury (Method 7470). It was proposed in the 1996 Semi-Annual report that an effectiveness well would be analyzed for Appendix IX parameters. The proposal, approved on January 29, 1997, stipulates the analysis of Appendix IX constituents, Method 8240 and Method 8270 to be conducted on one effectiveness well (CMW24) annually. The results of this sampling, conducted during the second half sampling period of 1999, are included in Appendix B

1999 Groundwater Analytical Results

The 1999 groundwater analytical summary results from Southwest Laboratories of Oklahoma (contract laboratory) are presented in Appendix B. The groundwater was sampled in compliance with the Permit parameters (Table 3). The first semi-annual sampling was conducted on May 25, 1999 and the second semi-annual sampling was conducted on November 9, 1999. Sampling and analyses will continue at the facility until the Groundwater Protection Standard is achieved, as specified in the post-closure permit.

Special qualifiers are to be noted during review of the laboratory analytical summaries. The laboratory utilizes analytical qualifiers such as the "J" flag. This indicates that a peak was detected near the constituent's retention time on the chromatograph but at a level below which can be accurately quantified for the analytical method.

Analyses of Upgradient Well - Monitor well CMW1AR is located up-gradient from the closed impoundment and the production process area. This monitor well was sampled during the fourth quarter of 1999. It contained no K001 constituents above the approved method detection limits, but did have a "J" flag in fluoranthene, and in benzo(b)fluoranthene.

Analyses of Compliance Wells - Three compliance monitor wells (CMW6, CMW7, and CMW8) are directly downgradient from the closed impoundment. Of these three wells, CMW8 was the only well to have concentrations above the detectable limits for creosote constituents. Due to the elevated naphthalene values detected, the groundwater sample had to be diluted to bring the target compounds into linear range of the instrument. The following constituents were detected in CMW8 for each half of 1999.

CMW8:	1st Half 1999	2nd Half 1999
Naphthalene	2500.0 ppb	2400.0 ppb
Total Xylene	50.0 ppb	32.0 ppb
Phenanthrene	270.0 ppb	990.0 ppb (J)
Carbazole	190.0 ppb	4.0 ppb (J)
Benzene	13.0 ppb	7.0 ppb
Acenaphthylene	36.0 ppb (J)	73.0 ppb
Fluoranthene	20.0 ppb (J)	68.0 ppb
Benzo(a)anthracene	Non Detect	2.0 (J)
Benzo(b)fluoranthene	Non Detect	1.0 (J)
Pentachlorophenol	4.0 (J)	Non Detect
Benzene	13.0 ppb	7.0 ppb
xylene	50.0 ppb	32.0 ppb

Analyses of Effectiveness Wells - Effectiveness wells (CMW3, CMW11, CMW19, CMW24, CMW61, and CMW66) measure the progress of the recovery system in recovering creosote product and dissolved constituents. These wells are located near the recovery wells and Trench #1 (Figure 2). In response to these corrective measures, dissolved creosote concentrations in the groundwater have been decreasing in some effectiveness wells.

Monitor well CMW11 is located 250 feet east of the line of recovery wells. Naphthalene concentrations in CMW11 show a decreasing trend at "below the limit of quantitation" since 1994 when it no longer contained creosote constituents. CMW11 contained 2080 ppb in June 1991, 358 ppb in June 1992, and less than 25 ppb in May 1993. The decrease in the naphthalene concentration analyzed from the groundwater in CMW11 presents strong evidence of the effectiveness of the on-site recovery system over the past several years.

Monitor well CMW24 is the designated well for annual Appendix IX analysis. This well did not contain any Appendix IX constituents above the quantitation limits for the

second half sampling period, however, it did detect "J" flags for eight (8) creosote constituents. In addition, a common laboratory introduced contaminant, methylene chloride, was detected. The arsenic, chromium and lead analyses were 72 ppb, 146 ppb and 43.3 ppb respectively. These metal analyses appeared to be elevated from the 1998 results because the groundwater sample was not collected using the slow flow purge method. Metals tend to partition in the fine sediments held in suspension, which elevate the groundwater analyses for metals. In light of the suspected quality of this data and the fact that these metals were not used in the process, this well was re-sampled in February 8, 2000 for analyses of these metals. Analytical results of 18 ppb arsenic, 17.5 ppb chromium and 5.3 ppb lead confirm that the metals are held in the sediment (Appendix B). The sampling method utilized for the sampling of this well for Appendix IX analysis will be modified in 2000.

CMW 24 was also analyzed for acenaphthylene and naphthalene using the G.C. method. Naphthalene had a detection in this method of130 ppb. Since there was no indication of naphthalene using the mass spectrometer method for analyses (Appendix IX), there was a false positive for the G.C. method analyses.

Originally, monitor well CMW3, located downgradient from the closed impoundment, had elevated naphthalene, phenanthrene and carbazole in past years, and contained a trace of product in 1991. However, consistent with the improved groundwater quality due to corrective action, CMW3 detected only 74 ppb of naphthalene in the 4th quarter of 1995, 34 ppb in November, 1996, and non-detect for all of 1997 and 1998, which again showed the effectiveness of the on-site recovery system. CMW3 was re-developed to remove accumulated sediment from the casing in May of 1999. It is believed that this well is damaged and a proposal to plug and replace this well will be submitted to MDEQ.

In continuance of this trend in improved groundwater quality, CMW19 declined from 14600 to 1800 ppb naphthalene concentrations from the first half to the second half

sampling period in 1998 and to 1400 ppb by the second semiannual of 1999. Acenaphthylene was detected at 220 ppb for the second half of 1999.

CMW66 is the replacement well for CMW53 and is located immediately south of Trench #1. Analyses of groundwater from CMW66 were non-detect for the first half of 1999 and 700.0 ppb in the second half for naphthalene. Acenaphthylene was reported as 267 ppb in 1998, non detect for the first half of 1999 and 340 ppb in the second half of 1999.

Monitor well CMW61 detected fluoranthene at low concentrations of 16 ppb in March 1994, 15 ppb in February 1995, 16 ppb in February 1996, and 24 ppb in November 1996. In the first half of 1998, acenaphthene was detected at a concentration of 445 ppb. Acenaphthene was non detect in the second half 1998 sampling as well as for both sampling events in 1999. Monitor well CMW60, located 175 feet north of CMW61 has never detected any creosote constituents above the quantitation limit. Two groundwater recovery wells have been operational in this area since June 1995.

Analyses of Boundary Wells - Sampling of the boundary wells (CMW14, CMW16, CMW26, CMW27, CMW51, CMW56, CMW57, CMW60 and CMW65) is required by the Permit. These historically clean wells are the first indication of contaminant migration. Although these wells continued to be free of dissolved creosote constituents during 1998 sampling events, wells CMW27 and CMW60 reported at least one "J" flag during the second semiannual sampling period.

Monitor wells CMW27, CMW51 and CMW60 are sampled as property boundary wells to monitor the SWMU plume located on the eastern facility boundary. Monitor well CMW51, located on cemetery property south of the SWMU area, has not detected creosote constituents during the 1999 sampling events.

A total of six wells (CMW14, CMW16, CMW26, CMW56, CMW57 and CMW65) were sampled in 1999 to monitor migration of the plume that originates in the production process area. All of the wells were analytically clean in 1999.

Recently–installed monitor wells CMW28, CMW29, and CMW30 were placed in locations where gaps existed in the boundary monitoring system. Wells CMW28 and CMW29 were intended to be located to the east and north, respectively, from well CMW27. The current surveyed locations of these two wells are in question. For the present, CMW28 and CMW29 will be spotted on the base maps at the proposed locations and will be accurately placed when the survey question is resolved. During the second semiannual sampling event, a "J" flag was reported for naphthalene in CMW28. CMW29 had a detection of 14 ppb flouranthene in the second half of 1999. CMW30, in the southeast portion of the facility, did not contain dissolved constituents in either 1999 sampling event.

Analyses of Deep Monitoring Wells - Eutaw monitoring wells (CME3, CME5, CME6, CME7 and CME8) have been historically utilized to monitor the Eutaw formation to ensure that the contaminant plume is not migrating downward. No analyzed Eutaw wells detected K001 constituents above the quantitation limits in 1999. CME7 and CME3 had "J" flags for naphthalene in the first semiannual sampling. CME5 had three "J" flags for acenaphthalene, pentachlorophenol and carbazole.

CONTAMINANT EXTENT IN THE ALLUVIAL DEPOSITS

Past soil investigations and groundwater monitoring programs concluded that two separate contaminant sources were present, and hence two separate free product plumes. The contaminant plumes are composed of both free creosote product and dissolved constituents. The free product in the production process area concentrates primarily on the erosional depressions of the Eutaw surface. The groundwater recovery

wells and collection trenches are concentrated in these erosional depressions to maximize free product recovery.

The dissolved constituent plumes parallel the east to south-southeast groundwater flow direction. Based on the 1999 analytical data, Figures 3 and 4 were constructed to show the configuration of the plumes in the alluvial formation for the first half sampling period (Figure 3) and the second half sampling period (Figure 4). Included also is the small impacted area around CMW29. This reflects the fluoranthene detection noted in this well sample for the second half analyses.

HYDROLOGICAL ASSESSMENT

The Permit requires that subsurface measurements be collected, evaluated and hydrological assessments reported. This report section meets these requirements.

Groundwater Elevations

Groundwater elevations and product thicknesses in selected monitor wells were measured monthly by facility personnel to monitor the influence of the pumping wells on the water table and on free product movement and recovery. Measurements of depth to water from the top of casing, and product thickness are recorded during each semi-annual groundwater sampling by the Kerr-McGee Hydrologic Field Assistant. Water level measurements were recorded May 26 and November 9, 1999.

Alluvial Potentiometric Surface

Although the structure of the Eutaw formation beneath the alluvial controls the migration of free product, any migration of dissolved constituents is controlled by the groundwater flow direction. Potentiometric surface maps were constructed on the groundwater elevations measured semi-annually by the Kerr-McGee Water Quality Specialist. The 1999 first half and second half potentiometric surface maps are presented as Figures 5 and 6.

The potentiometric surface varies by approximately 14 feet across the facility with an average gradient of 1 foot/150 feet (0.007). Generally the groundwater flow direction is in a southeasterly direction. Pumping the recovery wells and the recovery trenches affects groundwater flow direction by creating capture zones. Pumping of the system has affected the potentiometric surface and enhanced groundwater recovery. Capture zones are observed surrounding both Trench 1 and Trench 2.

Potentiometric Surface of the Eutaw Formation

The alluvium is unconformably underlain by the upper-most member of the Cretaceous-Age Eutaw formation. Water level measurements were recorded in the Eutaw monitoring wells during the 1999 sampling events. The Eutaw formation static water level is typically measured at approximately 6 - 19 feet below grade. Groundwater flow in the Eutaw formation is in an east-southeasterly direction at a gradient of 0.009. Potentiometric maps constructed on the Eutaw formation for each sampling period are shown on Figures 7 and 8.

Eutaw monitor well CME6 is constructed through a discontinuous weathered shale zone and is not screened within the same lithologic formation as the other Eutaw monitor wells. Hence, monitor well CME6 historically has a lower groundwater elevation than the other Eutaw wells. This groundwater elevation is not considered representative of the Eutaw aquifer and therefore is not used for the construction of the potentiometric maps.

Groundwater Velocities

Groundwater velocities in both the alluvial formation and the underlying Eutaw formation were calculated to predict the migration velocity of the dissolved constituents. Flow gradients (dh/dl), obtained from the potentiometric surface maps, were substituted into the following equation (Lohman, 1979) which has been modified to include conversion factors:

$$v = \frac{K\, dh/dl}{7.481\ gal/ft^3\ \theta}$$

where v = average velocity (ft/day)

K = hydraulic conductivity gpd/ft^2

dh/dl = gradient of potentiometric surface (ft/ft)

θ = effective porosity (assume 20%)

Alluvial Formation Groundwater Velocity - Hydraulic conductivity values of 7 gpd/ft^2, 22 gpd/ft^2, and 30 gpd/ft^2 were previously calculated in April 1983 by performing a "slug test" on monitor wells CMW1, CMW2, and CMW3. An aquifer test, performed June 20, 1989, on recovery well RW2 revealed a hydraulic conductivity for the alluvial formation of 10.7 gpd/ft^2. An average of these four hydraulic conductivities, 17.4 gpd/ft^2 was used to determine the groundwater velocity in the alluvium at the Columbus Facility for the two sampled periods of 1999. These velocity values ranged from 7.2×10^{-2} to 8.4×10^{-2} feet per day and are summarized on Table 5.

Eutaw Formation Groundwater Velocity - The hydraulic conductivity for the Eutaw formation was calculated during a January 1992 pump test of CME3 at 0.24 gpd/ft^2 (1.1×10^{-5} cm/sec). The pump test is discussed in the 1992 Semi-annual Performance Evaluation of Corrective Action report (KMCLLC, 1992). A similar hydraulic conductivity value (0.21 gpd/ft^2) was also obtained from laboratory permeability testing of the Eutaw sample taken during drilling of CME2 on October 16, 1989. The hydraulic conductivity value of 0.24 gpd/ft^2 is used to calculate groundwater flow velocity.

A velocity value for the Eutaw formation was calculated using the gradient determined from the 1999 first half semi-annual potentiometric map. The groundwater velocity is calculated at 1.4×10^{-3} feet/day (5.1×10^{-7} cm/sec). The groundwater velocity in the Eutaw formation is significantly lower (an order of magnitude) than that of the alluvial formation.

CORRECTIVE ACTION PROGRAMS

KMCLLC presently has a variety of recovery methods utilized for the collection of both creosote product and dissolved constituents in the groundwater. Containment trenches (Trench #1A, Trench #1B, and Trench #2) with three collection galleries (MH1, MH2, and MH3) serve as hydraulic barriers for capture of dissolved constituents and to recover free product. A total of 12 alluvial recovery wells have been installed at the facility and 26 alluvial piezometers are in place to monitor the recovery well and trench efficiency. Table 6 includes the inventory of the recovery system wells and also the sumps (MH1-MH3) located in the trenches.

All groundwater is routed through the above-ground oil-water separator. The 35,000 gallon tank is utilized for recovered groundwater and creosote product, not for production process water. After the separation process, the wastewater is cycled through the facility wastewater treatment system and discharged to the POTW. The separated creosote product is recycled and used in the production process.

Hydraulic Barrier Recovery Wells

The purpose of initial corrective action was to prevent off-site migration of creosote product found in the structural lows of the Eutaw surface south of the production process area. The original recovery operation consisted of five recovery wells (RW3, RW4, RW5, RW6, and RW7) placed south of the production process area. These 8-inch diameter recovery wells were placed approximately 100 feet apart with piezometers placed between each well to measure the area influenced by the pumping wells. Well completion diagrams for recovery wells were previously described in the *1993 Semi-Annual Corrective Action Performance Evaluation Report* (Kerr-McGee Chemical Corporation, 1993). This series of wells removed approximately 7.5 million gallons of fluid prior to the installation of the three recovery trenches in August 1992.

Trench 1 is now used as the hydraulic groundwater barrier. Recovery wells RW4 and RW6 are used exclusively for product removal, as was recommended in *the Post-*

Closure Permit Application, Volume III (Kerr-McGee Corporation, 1991). These wells are measured for product thickness and pumped weekly to remove accumulated product. Recovery wells RW3, RW5 and RW7 control the groundwater movement through this area, and pump daily as the water-level recovers in each well.

All groundwater from recovery wells RW3 through RW7 continues to be pumped directly into a 2,000 gallon recovery tank. The recovery tank has float probes so that when it is full, it pumps into the facility oil/water separator.

Production Process Recovery Wells

As a voluntary corrective action measure, two recovery wells (RW2 and RW9) were constructed in the production process area near the decommissioned oil-water separator for supplemental removal of free phase product. Recovery well RW2 is evacuated at least twice a week for product removal. Recovered groundwater and product is pumped and recycled into the production process for tie treating. Recovery well RW9 presently contains less than 0.20 feet of product so it has been placed on a weekly product removal schedule. An additional recovery well, RW13, was installed in June 1997 in the vicinity of monitor well CMW9.

Containment Trenches and Collection Galleries

KMCLLC revised the hydraulic barrier well system by installing a de-watering gallery and a system of trenches for corrective action. These galleries/trenches were constructed south of the process area and at the SWMU area that is located east of the production process area. Locations of the three collection galleries and the trenches are shown on Figure 2.

Collection Galleries - A total of three collection sumps have been installed in the two trenches (Figure 2) for groundwater and product removal. Two collection galleries (sumps) were placed in the lowest Eutaw erosional surface found in the east-west trending Trench #1A. The third sump was placed in the SWMU area, in the southern end of Trench #2.

Each sump pump is equipped with an hour meter. Total gallons from each collection gallery have been recorded in the past by flow meters. However, due to the corrosive nature of creosote and the inability of the flow meter to perform dependably, the flow volume has been calculated for 1999 by subtracting the drip pad volume from the amount of water treated through the oil/water separator and discharged to the POTW.

SWMU Recovery Wells

The SWMU groundwater recovery wells (RW10, RW11 and RW12) are located in the black tie storage area (Figure 2). In accordance with the *Post Closure Permit Application, Part B, Volume III* (Kerr-McGee Corporation, 1991), KMCLLC installed recovery wells RW11 and RW12 in December 1992 to recover dissolved constituents at the eastern facility boundary by forming a hydraulic barrier. RW11 and RW12 contain conductivity probes to control pumping water levels in the wells. Presently, neither well contains measurable product.

Recovery well RW10 was installed upgradient of SWMU Trench #2, in a structural low area on the Eutaw formation. Although product accumulation in this well has not occurred, RW10 also contains conductivity probes to control pumping water level. This well is also discharged to the oil-water separator.

Product Removal from Monitor Wells

As part of the interim corrective action measure, a product removal program was initiated in August 1993 to remove product from each monitor well. Prior to removal, a product thickness measurement is taken and documented.

As a method for measuring the effectiveness of the system for product removal, product is not removed from CMW17. This serves as a means to observe the overall effect of product removal interior to the plume. For example, recovery well RW2 is located within 50 feet of CMW17.

All monitor wells located within the free product plume are measured weekly for product thickness changes which occur as a result of product recovery. Wells with greater than 0.10 feet of product are evacuated on a weekly basis. Wells with less than 0.10 feet of product are evacuated monthly.

ASSESSMENT OF CORRECTIVE ACTION

The effectiveness of the recovery system is based on recovered and treated fluid volume, and also on the zone of capture produced by the pumping systems. KMCLLC recognized that to monitor the effectiveness of the pumped trenches and the recovery wells, water levels would need to be measured. Piezometers, located in close proximity to the pumping wells and the trenches, are measured monthly to determine the effects of pumping wells on the alluvial aquifer. The piezometer locations are shown on Figure 2.

Pumping the recovery wells and the recovery trenches creates a local effect on the static water levels as the groundwater flows to the series of remediation wells designed to capture free product and the dissolved contaminant plume. Pumping of the system has affected the potentiometric surfaces shown on Figures 5 and 6. Capture zones are observed surrounding both Trench #1 and Trench #2.

Product Thickness

Prior to product removal, the measured product thicknesses are recorded. These measurements are contained in Appendix D. Measured product thickness for the past five years has been graphed for comparison purposes. The graph of CMW17, with no product removal, is contained in Appendix E. Graphs for monitor wells, recovery wells and piezometers which have weekly product removal programs are contained in Appendix F.

The graph of CMW17 (not a pumped well) shows that the initial product thickness may vary seasonally. Measured product thickness between July 1995 and December 1995 appears to stabilize. However, since November 1996, product thickness has declined. This fluctuation may be due to the continued, systematic removal of product from surrounding wells RW2 and CMW18.

Monitor wells CMW10, CMW12, CMW18, CMW25, and piezometers P1, P3, P18 and P22 showed product thickness reductions after the start-up of the recovery sumps and also after the removal of free product from monitor wells began. Particularly noteworthy is the reduction of product in CMW10. At the beginning of 1994, CMW10 measured 0.77 feet of product. Currently, the well is measuring only a trace (0.05 feet). KMCLLC feels that the recovery system is pulling product back towards RW7 and therefore is an effective measure of the recovery system.

Recorded product thickness in the recovery wells depict two positive trends. First, wells pumped constantly (RW3 through RW7) appear to have fairly constant product thicknesses, which show a constant flow of product without altering the wetability of the formation to creosote. Second, other recovery wells have variable measurements but they show a general, overall reduction in product thickness.

Recovered Groundwater Volume

Since November 1994, with the installation of the groundwater oil-water separator, all recovered groundwater and product from the sumps are pumped directly to the oil-water separator. All recovered fluid from the three sumps located in the trenches is recorded by flow meters and hour meters. Cumulative yearly production data is presented in Table 7. A graph of the groundwater production from 1990 to present is contained in Appendix G.

Recovery Well Volume - The recovery of free creosote product and dissolved constituents from the five 8" recovery wells (RW3, RW4, RW5, RW6, and RW7) was initiated in August 1990. Approximately seven (7) million gallons of contaminated

groundwater and free creosote product have been recovered from the recovery wells from August 1990 to October 1992 when the recovery trenches came on-line.

The volume of groundwater pumped from individual wells is no longer calculated and recorded due to the insignificant amount of pumped volume compared to that volume recovered by the trenches; however, the facility records the hour meters weekly.

An undetermined volume of groundwater and creosote has also been pumped from the production process and SWMU recovery wells. Recovery wells RW2, RW9, RW10, RW11, RW12, and RW13 have no volume measuring devices.

Collection Trench Volume - Approximately 3.6 million gallons of groundwater and creosote product have been recovered during the twelve months of 1999 based on trench recovery volumes. More than 66 million gallons have been recovered and treated since the start-up of the recovery system in August 1990 (see Table 7).

INSPECTION AND MAINTENANCE PROGRAM

The facility has implemented a schedule of preventive maintenance on both the recovery systems and the piezometers to ensure that groundwater samples are representative and the recovery systems are operational. Monitor wells are inspected quarterly by the Hydrologic Field Assistant, and comments on observances are added to the Sampling Event Summary Sheet (Appendix C).

Recovery System Maintenance

The recovery system is visually inspected daily and a preventive maintenance schedule is utilized to ensure that equipment is in working order and the conductivity probes are correctly sensing water levels. Comments and inspections are documented on daily checklists. Additional gaskets and a spare pump have been inventoried at the facility

for emergency repairs to maintain continuous operation of the system. An example of the daily inspection record sheet is placed in Appendix H.

1999 Groundwater Program

The 1999 corrective action sampling schedule includes wells currently required by the Permit. Additional property boundary monitor wells may be periodically sampled to monitor the effectiveness of the recovery system and also to monitor contaminant migration. Table 8 is the proposed sampling schedule for 2000. This schedule has incorporated the Appendix IX analyses of an Effectiveness Well (CMW24) as outlined in the January 19, 1996 Permit modification. KMCLLC-FPD may submit a modified sampling plan in the up-coming Permit renewal application.

CONCLUSIONS

Facility-wide Corrective Action for recovery of both creosote product and constituents in the groundwater has been in effect since August 1990. To date, the operation of the groundwater recovery program has effectively recovered and treated approximately 65.6 million gallons of contaminated groundwater and free product. The recovery program has also controlled the migration of product.

Based on the graphs comparing product thickness with time, the corrective action systems have enhanced product recovery. Many monitor wells show a distinct trend of reduction in product thickness. In addition, contaminant concentrations found in some monitoring wells have diminished over the past year. KMCLLC believes that just as an overall decline in free product is noted in some monitor wells, a trend of diminished contaminant concentrations in the dissolved plume will be consistent with continued operations of the groundwater corrective action system.

With the issuance of the HSWA permit, KMCLLC will be augmenting the current corrective action measures with further investigations and possibly additional corrective action. KMCLLC will continue to conduct corrective action at the facility as necessary to restore groundwater quality to the Groundwater Protection Standard.

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TABLES

TABLE 1: INVENTORY OF GROUNDWATER MONITORING WELLS
KMCLLC-FPD, COLUMBUS, MISSISSIPPI

Well Number	COMMENTS	Depth of Well Below TOC (ft.)	Depth of Well Below Ground Surface (ft.)	Elevation Well Depth MSL	Height of Casing Above Grade (ft.)	Elevation reened Interval MSL			Elevation W. Eutaw (ft. MSL)	Elevation Green Eutaw (ft. MSL)	Top of Casing Elevation (ft. MSL)	Surveyors Pin Elevation (ft. MSL)	Surface Elevation (ft.MSL)
CMW-1	Plugged 12/10/92	27.35	23.00	165.58	4.35	180.58	to	165.58		159.58	192.93	NA	188.58
CMW-1A	Plugged 7/12/99	20.52	18.00	162.39	2.52	172.39	to	162.39		164.89	182.91	NA	180.39
*CMW-1AR	Re-surveyed 8/93	19.20	17.00	163.56	2.20	175.06	to	165.06	165.06		183.03	181.06	180.83
CMW-2	Plugged 7/12/99	28.22	25.00	152.80	3.22	169.80	to	152.80		152.66	181.02	NA	177.80
CMW-3		27.76	24.00	154.09	3.76	172.09	to	154.09		152.06	181.85	NA	178.09
CMW-4	Plugged 7/13/99	23.63	20.00	158.45	3.63	172.45	to	154.45		155.54	182.08	NA	178.45
CMW-5	TOC lowered 6/94,resurveyed	27.34	27.50	151.23	-0.12	171.23	to	151.23		154.73	178.57	179.01	178.69
*CMW-6		23.29	20.00	157.77	3.29	169.27	to	159.27		159.27	181.06	178.21	177.77
*CMW-7		25.90	22.50	155.37	3.40	166.87	to	156.87		156.87	181.27	178.37	177.87
*CMW-8		25.39	22.00	156.24	3.39	167.74	to	157.74	157.74		181.64	178.81	178.24
CMW-9		27.58	24.00	155.34	3.58	165.34	to	156.34		156.14	182.92	179.98	179.34
CMW-10		25.57	22.50	155.87	3.07	165.87	to	156.87		156.87	181.44	178.81	178.37
CMW-11	TOC & GL raised	21.84	21.91	156.46	-0.07	166.46	to	154.46	157.46		179.10	179.30	179.17
CMW-12	TOC lowered 12/8/92	26.13	24.50	155.87	1.63	165.87	to	156.87		156.87	182.02	181.05	180.39
CMW-13	Plugged	28.04	24.50	154.42	3.54	164.42	to	155.42		155.42	180.80	179.42	178.92
CMW-14		27.69	24.00	154.17	2.57	164.17	to	155.17	154.67		180.74	178.87	178.17
CMW-15		20.71	17.50	161.89	3.21	171.89	to	162.89	163.19		182.60	180.06	179.39
CMW-16		27.79	24.50	159.80	3.29	169.80	to	160.80	160.80		187.59	184.86	184.30
CMW-17		29.90	28.00	152.82	1.90	165.32	to	156.32		156.72	182.87	180.65	180.82
CMW-18		32.81	30.00	151.08	2.81	163.58	to	154.58		153.68	183.72	181.53	181.08
*CMW-19	Resurveyed 7/93	29.97	29.26	151.64	0.71	163.64	to	153.54	154.84	153.84	181.61	181.87	180.90
*CMW-20	Plugged 7/13/99	27.00	23.80	155.86	3.20	167.46	to	157.76	160.66	157.66	182.86	180.14	179.66
*CMW-21		27.68	24.30	153.42	3.38	165.02	to	155.32	156.72	153.22	181.10	178.60	177.72
*CMW-22		32.20	28.80	153.78	3.40	165.38	to	155.68	156.58	155.68	185.98	183.04	182.58
CMW-23	Plugged 7/12/99	14.48	14.67	161.55	-0.19	171.35	to	162.35		162.35	175.64	176.08	175.83
*CMW-24		19.22	19.50	154.13	-0.28	164.63	to	154.93	158.03	157.13	173.35	173.73	173.63
CMW-25		22.57	23.00	157.73	-0.43	167.53	to	158.53	157.93	154.13	180.30	180.79	180.73
CMW-26		25.45	25.80	155.84	-0.35	166.44	to	157.44	156.14	152.14	181.29	181.75	181.64
*CMW-27		14.06	14.80	162.01	-0.74	168.66	to	163.96	162.91	161.51	176.07	176.82	176.81
CMW-28		14.88	15.00	159.10	-0.12	169.28	to	159.28		159.98	173.98	174.24	174.10
CMW-29		14.86	15.00	161.13	-0.14	171.43	to	161.43		161.63	176.13	176.33	176.27
CMW-30		18.67	19.00	156.21	-0.33	166.51	to	156.21	156.71	155.21	175.21	175.60	175.54
CMW-51		24.18	24.50	156.96	-0.32	169.46	to	160.46	159.46	154.46	181.14	181.54	181.46
CMW-52	Resurveyed 7/93	23.54	20.63	156.64	2.91	166.44	to	157.44	157.14	156.44	180.18	177.87	177.27
CMW-53	Plugged 7/93	22.01	21.99	155.34	0.02	165.14	to	156.14	156.04	152.64	177.35	177.48	177.33
*CMW-54	plugged 10/95	23.02	22.72	154.69	0.30	165.43	to	156.43	155.83	152.63	177.71	177.95	177.41
*CMW-55		24.28	24.50	154.69	-0.22	165.59	to	156.59	156.19	152.39	178.97	179.29	179.19
*CMW-56	Resurveyed 7/93	23.71	21.44	155.15	2.27	166.10	to	157.10	158.35	155.95	178.86	177.17	176.59
*CMW-57		23.59	24.00	156.72	-0.41	167.52	to	158.52	156.92	154.32	180.31	180.79	180.72
*CMW-58		22.79	22.00	154.12	-0.33	165.12	to	155.62	157.82	153.52	175.79	176.17	176.12
*CMW-59	Plugged	19.50	19.50	155.28	-0.13	166.78	to	157.28	156.78	155.98	174.65	174.88	174.78
*CMW-60		19.25	16.89	156.50	2.36	163.29	to	158.42	160.45	160.25	175.75		173.39
*CMW-61		19.43	17.11	156.49	2.32	163.28	to	158.41	160.42	160.37	175.92		173.60
*CMW-62		24.00	24.25	154.14	-0.25	165.80	to	156.06	155.54	154.19	178.14		178.39
*CMW-63		26.37	27.02	151.17	-0.65	162.83	to	153.09	153.69	151.69	177.84		178.19
CMW-64	plugged 10/95	20.27	20.50	158.29	-0.23	168.49	to	159.19	156.99	155.59	178.56	178.82	178.79
CMW-65		20.74	21.00	157.36	-0.26	167.56	to	158.26	157.56	152.86	178.10	178.76	178.36
*CMW-66		26.79	25.17	151.11	1.62	163.62	to	153.91	153.53	152.83	177.90	177.02	176.28
CME-1	Plugged 4/24/95	53.58	51.00	129.49	2.58	141.99	to	132.99		154.09	183.16	180.93	180.49
*CME-2	Plugged 4/24/95	44.01	41.40	137.12	2.61	148.72	to	139.02	155.52	152.72	181.13	179.12	178.52
*CME-3		54.59	52.34	131.70	2.25	143.84	to	134.14	160.64	155.64	186.29	184.64	184.04
*CME-4	Plugged 4/24/95	41.71	39.30	141.30	2.41	152.90	to	143.20	154.60	153.60	183.01	181.32	180.60
*CME-5		47.72	47.80	125.68	-0.08	137.48	to	127.58	155.48	154.58	173.40	173.64	173.48
*CME-6		52.88	53.00	126.61	-0.12	138.21	to	128.51	158.91	156.61	179.49	179.76	179.61
CME-7		49.85	50.00	130.13	0.41	139.72	to	129.72		156.17	179.98		179.57
CME-8		48.72	48.10	129.95	0.31	140.41	to	130.41		153.76	178.67		178.36

* = Denotes stainless steel cased monitor well
CMW = Shallow Alluvial Wells
CME = Eutaw Formation Wells

TABLE 2: INVENTORY OF PIEZOMETERS
KMCLLC-FPD, COLUMBUS, MISSISSIPPI

Piez. Number	COMMENTS	Depth of Piez Below TOC (ft.)	Depth of Piez Below Ground Surface (ft.)	Elevation Depth MSL	Height of Casing Above Grade (ft.)	Elevation Screened Interval MSL			Elevation W. Eutaw (ft. MSL)	Elevation Green Eutaw (ft. MSL)	Top of Casing Elevation (ft. MSL)	Surveyors Pin Elevation (ft. MSL)	Surface Elevation (ft.MSL)
P1		22.86	23.00	156.62	-0.14	166.92	to	156.92		156.12	179.48	179.68	179.62
P2		23.90	24.00	155.01	-0.10	165.31	to	155.31			178.91	179.02	179.01
P3		23.86	24.00	154.27	-0.14	164.57	to	154.57			178.13	178.28	178.27
P4		22.64	23.00	154.60	-0.36	164.90	to	154.90		154.94	177.24	177.60	177.60
P5		23.81	24.00	153.74	-0.19	164.04	to	154.04		153.55	177.55	177.78	177.74
P6		21.88	22.00	157.56	-0.12	169.96	to	160.96	157.74	155.34	179.44	179.74	179.56
P7		23.01	23.00	158.10	0.01	168.00	to	159.00	156.44	154.04	181.11	181.42	181.10
P8	P&A - 7/99	39.23	39.00	144.48	0.23	154.38	to	145.38	160.08	155.08	183.71	183.72	183.48
P9	Located in trench	19.74	20.00	155.94	-0.26	156.84	to	147.54			175.68	175.94	175.94
P10	Located in trench	20.26	20.50	155.37	-0.24	156.27	to	146.97			175.63	175.94	175.87
P11	Located in trench	19.98	20.00	155.86	-0.02	156.76	to	147.46			175.84	176.07	175.86
P12	Located in trench	19.70	20.00	155.49	-0.30	156.39	to	147.09			175.19	175.44	175.49
P13		15.69	16.00	159.18	-0.21	160.08	to	150.78	159.48	157.88	174.97	175.28	175.18
P14		14.97	15.30	160.03	-0.33	160.93	to	151.63	159.73	157.73	175.00	175.41	175.33
P15		15.26	15.50	157.17	-0.24	158.07	to	148.77	none	157.17	172.43	172.70	172.67
P16		16.68	17.00	156.35	-0.32	157.03	to	147.95	158.35	157.65	173.03	173.35	173.35
P17		24.99	22.46	154.75	2.53	164.85	to	155.84	154.91	152.40	179.74	177.96	177.21
P18	Located in trench	19.54	16.37	160.88	3.17	170.98	to	161.98			180.42	177.82	177.25
P19		26.34	22.96	154.93	3.38	165.03	to	156.09	155.57	151.97	181.27	178.59	177.89
P20	Located in trench	20.48	18.31	158.61	2.17	168.71	to	159.71			179.09	177.62	176.92
P21		27.77	25.12	152.10	2.65	162.20	to	153.20		149.17	179.87	177.84	177.22
P22		24.74	22.11	154.39	2.63	163.39	to	155.47		154.50	179.13	177.13	176.50
P23	Located in trench	19.51	16.86	159.67	2.65	169.77	to	160.77			179.18	177.19	176.53
P24		30.22	28.19	150.04	2.03	160.14	to	151.14		149.73	180.26	178.87	178.23
P25		20.37	20.46	157.35	-0.09	167.45	to	158.45		156.30	177.72	178.21	177.81
P26		15.67	15.73	157.84	-0.06	167.94	to	158.94		157.57	173.51	173.87	173.57
P27		23.93	21.30	156.67	2.63	157.77	to	166.77		154.27	180.60	178.63	177.97

P = Piezometers

TABLE 3
1999 CORRECTIVE ACTION GROUNDWATER SAMPLING SUMMARY
Outlined in Permit #HW-90-329-01, Modified 1/3/97

1999 Columbus, Miss.	WELL	1ST SEMI-ANNUAL 1ST QTR	1ST SEMI-ANNUAL 2ND QTR	2ND SEMI-ANNUAL 3RD QTR	2ND SEMI-ANNUAL 4TH QTR
Compliance Wells	CMW6		DEFP		DEFP
	CMW7		DEFP		DEFP
	CMW8		DEFP		DEFP
Effectiveness Wells (Odd years analyze P&H for both semi-annuals- Even years analyze DEH for One semi-annual)	CMW3		PH		PH
	CMW11		PH		PH
	CMW19		PH		PH
	CMW24		PH		PHJ
	CMW61		PH		PH
	CMW66		PH		PH
Boundary Wells	CMW14		DEFP		DEFP
	CMW16		DEFP		DEFP
	CMW26		DEFP		DEFP
	CMW27		DEFP		DEFP
	CMW51		DEFP		DEFP
	CMW56		DEFP		DEFP
	CMW57		DEFT		DEFP
	CMW60		DEFP		DEFP
	CMW65		DEFP		DEFP
Boundary Wells (not permit required)	CMW28		DEFP		DEFP
	CMW29		DEFP		DEFP
	CMW30		DEFP		DEFP
Deep Monitoring Wells	CME3		DEFP		DEFP
	CME5		DEFP		DEFP
	CME6		DEFP		DEFP
	CME7		DEFP		DEFP
	CME8		DEFP		DEFP
Upgradient Well	CMW1AR				DEFP

F- Benzene and Total Xylene D- FORP Base/Neutral E- FORP Acid P- Total phenol J- Appendix IX
H-Acenaphthylene, Naphthalene using GC Method
NOTE: If immiscible liquids are present, samples from the affected well are not collected; however, the immiscible phase thickness is recorded on the field parameter form. Free product is bailed from the well semi-annually.

Field pH, field specific conductance and field temperature are measured and recorded on the field parameter form for all wells sampled. Water levels and immiscible liquid levels are measured on all monitoring wells.

TABLE 4

Appendix VII K001 Constituents
Primary Creosote Constituent Compounds

Acid Compounds

2-Chlorophenol
2,4-Dimethylphenol
p-Chloro-m-cresol
Pentachlorophenol
Phenol
2,4,6 - Trichlorophenol
2,3,4,6 - Tetrachlorophenol
2,4 - Dinitrophenol

Base/Neutral Compounds

Acenaphthylene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Carbazole
Dibenzo(a,h,)anthracene
Fluoranthene
Indeno(1,2,3-c,d) pyrene
Naphthalene
Phenanthrene

List of K001 compounds which are the major constituents of the preservative creosote which was used at the Columbus, Mississippi KMCLLC facility.

TABLE 5

1999
GROUNDWATER VELOCITY CALCULATIONS
FOR THE ALLUVIAL
KERR-MCGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION
COLUMBUS, MISSISSIPPI

1999 Semi-annual	GROUNDWATER VELOCITIES			
	ft/day	ft/year	cm/day	cm/sec
1ST HALF	7.2×10^{-2}	26	2.2	2.5×10^{-5}
2ND HALF	8.4×10^{-2}	31	2.5	3.0×10^{-5}

Average Hydraulic Conductivity is 17.4 gpd/ft^2

Uppermost (sand and gravel) alluvial aquifer summary of hydraulic conductivity and calculated groundwater velocities for 1999 semi-annual monitoring at the KMCLLC facility in Columbus, Mississippi.

TABLE 6: INVENTORY OF RECOVERY WELLS AND SUMPS
KMCLLC-FPD, COLUMBUS, MISSISSIPPI

Well Number	COMMENTS	Depth of Well Below TOC (ft.)	Depth of Well Below Ground Surface (ft.)	Elevation Well Depth MSL	Height of Casing Above Grade (ft.)	Elevation Screened Interval MSL			Elevation W. Eutaw (ft. MSL)	Elevation Green Eutaw (ft. MSL)	Top of Casing Elevation (ft. MSL)	Surface Elevation (ft.MSL)
*RW1		28.95	26.00	154.37	2.95	161.47	to	156.47		156.76	183.06	180.37
*RW2		30.00	27.00	153.32	3.00	160.82	to	155.82		154.82	182.67	180.32
#RW3		24.42	24.50	154.74	-0.08	160.54	to	155.54	160.16	155.66	179.16	179.24
#RW4		24.35	24.50	154.27	-0.15	160.07	to	155.07	157.62	155.62	178.62	178.77
#RW5		23.84	24.00	153.85	-0.16	159.65	to	154.65	154.69	153.69	177.69	177.85
#RW6		25.40	25.50	152.49	-0.10	158.29	to	153.29	156.49	154.59	177.89	177.99
#RW7		24.36	24.50	153.92	-0.14	159.72	to	154.72	155.28	153.78	178.28	178.42
#RW8	Plugged 4/24/95	28.51	28.26	151.90	0.25	157.66	to	152.76		151.56	180.41	180.16
+#RW9		25.90	25.90	154.39	0.00	159.84	to	154.84		154.45	180.29	180.29
#RW10	Surveyed 1/93, Resurveyed 5/93		23.50	156.64		162.09	to	157.09	158.44	156.34	180.66	180.14
#RW11	Surveyed 1/93, Resurveyed 5/93		17.50	155.49		160.94	to	155.94		157.19	173.50	172.99
#RW12	Surveyed 1/93, Resurveyed 5/93		17.50	155.22		160.67	to	155.67	155.72	155.22	173.14	172.72
#RW13												
Sump MH1	5' diameter, Trench 1	24.24	23.55	153.82	0.69	145.82	to	153.82		156.00	178.06	177.37
Sump MH2	5' diameter, Trench 1	26.36	23.82	152.95	2.54	144.95	to	152.95		156.00	178.31	176.77
Sump MH3	5' diameter, Trench 2	23.05	21.98	154.16	1.07	162.16	to	154.16		159.00	177.21	176.14

= Denotes galvanized steel cased recovery well
* = Denotes stainless steel cased
RW = Recovery Wells

TABLE 7:
GROUNDWATER PRODUCTION VOLUMES
KERR-McGEE CHEMICAL LLC - FPD
COLUMBUS, MISSISSIPPI

1999	Monthly Recovered Groundwater Recovery (Gallons)		
	MH1	MH2	MH3
January	177,200	119,800	99,400
February	152,200	122,500	105,400
March	144,300	118,900	101,300
April	171,600	120,300	108,500
May	159,600	115,600	99,600
June	122,300	92,300	82,500
July	118,100	88,500	78,300
August	101,100	90,100	77,400
September	88,200	78,100	56,200
October	75,800	70,100	62,300
November	80,200	75,600	72,400
December	79,600	74,200	63,800

TABLE 7:
GROUNDWATER PRODUCTION VOLUMES
KERR-McGEE CHEMICAL LLC - FPD
COLUMBUS, MISSISSIPPI

DATE	MONTHLY CUMULATIVE PRODUCTION	YEARLY CUMULATIVE PRODUCTION	TOTAL PUMPED PRODUCTION
6/90	0	0	0
7/90	0	0	0
8/90	1,360	1,360	1,360
9/90	149,756	151,116	151,116
10/90	266,792	417,908	417,908
11/90	165,669	583,577	583,577
12/90	556,968	1,140,545	1,140,545
1/91	269,525	269,525	1,410,070
2/91	357,974	627,499	1,768,044
3/91	554,911	1,182,410	2,322,955
4/91	322,431	1,504,841	2,645,386
5/91	247,793	1,752,634	2,893,179
6/91	72,803	1,825,437	2,965,982
7/91	326,760	2,152,197	3,292,742
8/91	286,523	2,438,720	3,579,265
9/91	289,950	2,728,670	3,869,215
10/91	172,235	2,900,905	4,041,450
11/91	147,129	3,048,034	4,188,579
12/91	189,428	3,237,462	4,378,007
1/92	288,890	288,890	4,666,897
2/92	290,597	579,487	4,957,494
3/92	483,946	1,063,433	5,441,440
4/92	710,848	1,774,281	6,152,288
5/92	257,792	2,032,073	6,410,080
6/92	261,691	2,293,764	6,671,771
7/92	277,837	2,571,601	6,949,608
8/92	242,511	2,814,112	7,192,119
9/92	199,335	3,013,447	7,391,454
10/92	146,447	3,159,894	7,537,901
11/92	406,008	3,565,902	7,943,909
12/92	2,074,382	5,640,284	10,018,291
1/93	607,064	607,064	10,625,355
2/93	531,900	1,138,964	11,157,255
3/93	1,174,200	2,313,164	12,331,455
4/93	950,800	3,263,964	13,282,255
5/93	1,488,700	4,752,664	14,770,955
6/93	1,298,100	6,050,764	16,069,055
7/93	1,155,100	7,205,864	17,224,155
8/93	849,150	8,055,014	18,073,305
9/93	1,168,700	9,223,714	19,242,005
10/93	851,450	10,075,164	20,093,455
11/93	875,500	10,950,664	20,968,955
12/93	1,014,900	11,965,564	21,983,855

TABLE 7:
GROUNDWATER PRODUCTION VOLUMES
KERR-McGEE CHEMICAL LLC - FPD
COLUMBUS, MISSISSIPPI

DATE	MONTHLY CUMULATIVE PRODUCTION	YEARLY CUMULATIVE PRODUCTION	TOTAL PUMPED PRODUCTION
1/94	1,034,200	1,034,200	23,018,055
2/94	703,700	1,737,900	23,721,755
3/94	1,108,900	2,846,800	24,830,655
4/94	543,800	3,390,600	25,374,455
5/94	856,440	4,247,040	26,230,895
6/94	1,865,080	6,112,120	28,095,975
7/94	1,131,600	7,243,720	29,227,575
8/94	1,295,781	8,539,501	30,523,356
9/94	1,397,900	9,937,401	31,921,256
10/94	1,376,800	11,314,201	33,298,056
11/94	1,295,630	12,609,831	34,593,686
12/94	617,300	13,227,131	35,210,986
1/95	867,000	867,000	36,077,986
2/95	441,520	1,308,520	36,519,506
3/95	358,800	1,667,320	36,878,306
4/95	449,400	2,116,720	37,327,706
5/95	716,300	2,833,020	38,044,006
6/95	704,700	3,537,720	38,748,706
7/95	807,700	4,345,420	39,556,406
8/95	670,540	5,015,960	40,226,946
9/95	820,800	5,836,760	41,047,746
10/95	899,300	6,736,060	41,947,046
11/95	780,000	7,516,060	42,727,046
12/95	926,300	8,442,360	43,653,346
1/96	700,000	700,000	44,353,346
2/96	707,920	1,407,920	45,061,266
3/96	868,000	2,275,920	45,929,266
4/96	680,000	2,955,920	46,609,266
5/96	654,100	3,610,020	47,263,366
6/96	664,500	4,274,520	47,927,866
7/96	668,050	4,942,570	48,595,916
8/96	695,100	5,637,670	49,291,016
9/96	784,500	6,422,170	50,075,516
10/96	898,225	7,320,395	50,973,741
11/96	850,000	8,170,395	51,823,741
12/96	790,600	8,960,995	52,614,341
1/97	545,100	545,100	53,159,441
2/97	478,200	1,023,300	53,637,641
3/97	532,300	1,555,600	54,169,941
4/97	573,700	2,129,300	54,743,641
5/97	457,400	2,586,700	55,201,041
6/97	442,600	3,029,300	55,643,641
7/97	458,700	3,488,000	56,102,341
8/97	441,500	3,929,500	56,543,841
9/97	396,600	4,326,100	56,940,441
10/97	465,200	4,791,300	57,405,641
11/97	409,100	5,200,400	57,814,741
12/97	488,000	5,688,400	58,302,741

TABLE 7:
GROUNDWATER PRODUCTION VOLUMES
KERR-McGEE CHEMICAL LLC - FPD
COLUMBUS, MISSISSIPPI

DATE	MONTHLY CUMULATIVE PRODUCTION	YEARLY CUMULATIVE PRODUCTION	TOTAL PUMPED PRODUCTION
1/98	450,000	450,000	58,752,741
2/98	426,800	876,800	59,179,541
3/98	412,700	1,289,500	59,592,241
4/98	421,800	1,711,300	60,014,041
5/98	408,100	2,119,400	60,422,141
6/98	447,100	2,566,500	60,869,241
7/98	360,400	2,926,900	61,229,641
8/98	339,200	3,266,100	61,568,841
9/98	347,900	3,614,000	61,916,741
10/98	359,700	3,973,700	62,276,441
11/98	348,800	4,322,500	62,625,241
12/98	345,800	4,668,300	62,971,041
1/99	396,400	396,400	63,367,441
2/99	380,100	776,500	63,747,541
3/99	364,500	1,141,000	64,112,041
4/99	400,400	1,541,400	64,512,441
5/99	374,800	1,916,200	64,887,241
6/99	297,100	2,213,300	65,184,341
7/99	284,900	2,498,200	65,469,241
8/99	268,600	2,766,800	65,737,841
9/99	222,500	2,989,300	65,960,341
10/99	208,200	3,197,500	66,168,541
11/99	228,200	3,425,700	66,396,741
12/99	217,600	3,643,300	66,614,341

TABLE 8
2000 PROPOSED CORRECTIVE ACTION
GROUNDWATER SAMPLING SUMMARY
Outlined in Permit #HW-90-329-01, Modified 1/3/97

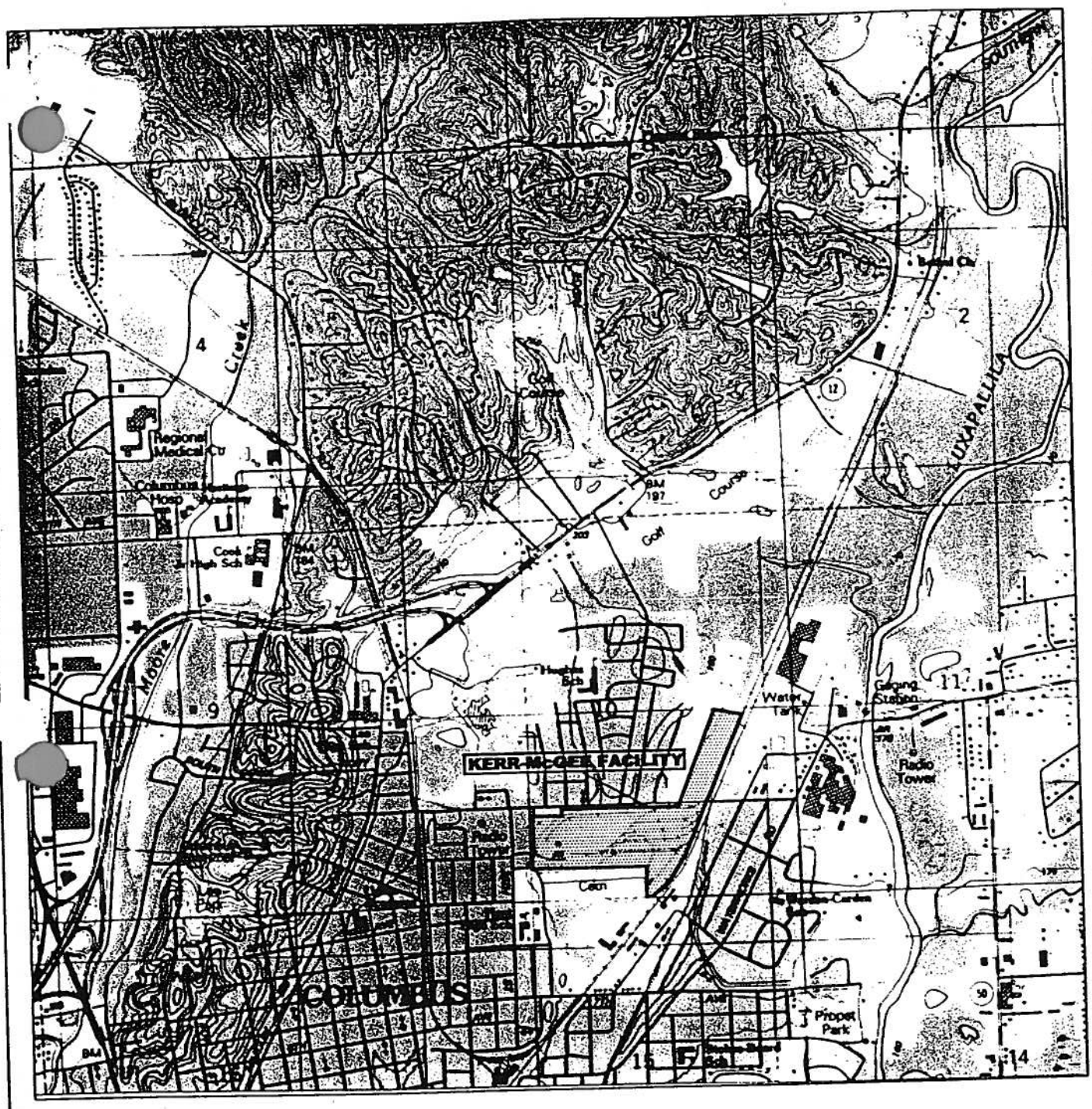
1999 Columbus, Miss.	WELL	1ST SEMI-ANNUAL 1ST QTR	1ST SEMI-ANNUAL 2ND QTR	2ND SEMI-ANNUAL 3RD QTR	2ND SEMI-ANNUAL 4TH QTR
Compliance Wells	CMW6		DEFP		DEFP
	CMW7		DEFP		DEFP
	CMW8		DEFP		DEFP
Effectiveness Wells (Odd years analyze P&H for both semi-annuals- Even years analyze DEFP for One semi-annual)	CMW3		DEFP		PH
	CMW11		DEFP		PH
	CMW19		DEFP		PH
	CMW24		DEFP		PHJ
	CMW61		DEFP		PH
	CMW66		DEFP		PH
Boundary Wells	CMW14		DEFP		DEFP
	CMW16		DEFP		DEFP
	CMW26		DEFP		DEFP
	CMW27		DEFP		DEFP
	CMW51		DEFP		DEFP
	CMW56		DEFP		DEFP
	CMW57		DEFT		DEFP
	CMW60		DEFP		DEFP
	CMW65		DEFP		DEFP
Boundary Wells (not permit required)	CMW28		DEFP		DEFP
	CMW29		DEFP		DEFP
	CMW30		DEFP		DEFP
Deep Monitoring Wells	CME3		DEFP		DEFP
	CME5		DEFP		DEFP
	CME6		DEFP		DEFP
	CME7		DEFP		DEFP
	CME8		DEFP		DEFP
Upgradient Well	CMW1AR				DEFP

F- Benzene and Total Xylene D- FORP Base/Neutral E- FORP Acid P- Total phenol J- Appendix IX H-Acenaphthylene, Naphthalene using GC Method

NOTE: If immiscible liquids are present, samples from the affected well are not collected; however, the immiscible phase thickness is recorded on the field parameter form. Free product is bailed from the well semi-annually.

Field pH, field specific conductance and field temperature are measured and recorded on the field parameter form for all wells sampled. Water levels and immiscible liquid levels are measured on all monitor wells.

FIGURES



QUADRANGLE LOCATION

COLUMBUS NORTH, MISS

LEGEND

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP

N

0 2000 FT

SCALE

FIGURE 1
SITE LOCATION MAP

KERR-McGEE CORP. HYDROLOGIC SERVICES DEPT.

COLUMBUS, MISSISSIPPI

MAP DATE: 9/97 | DRAWN BY: KB

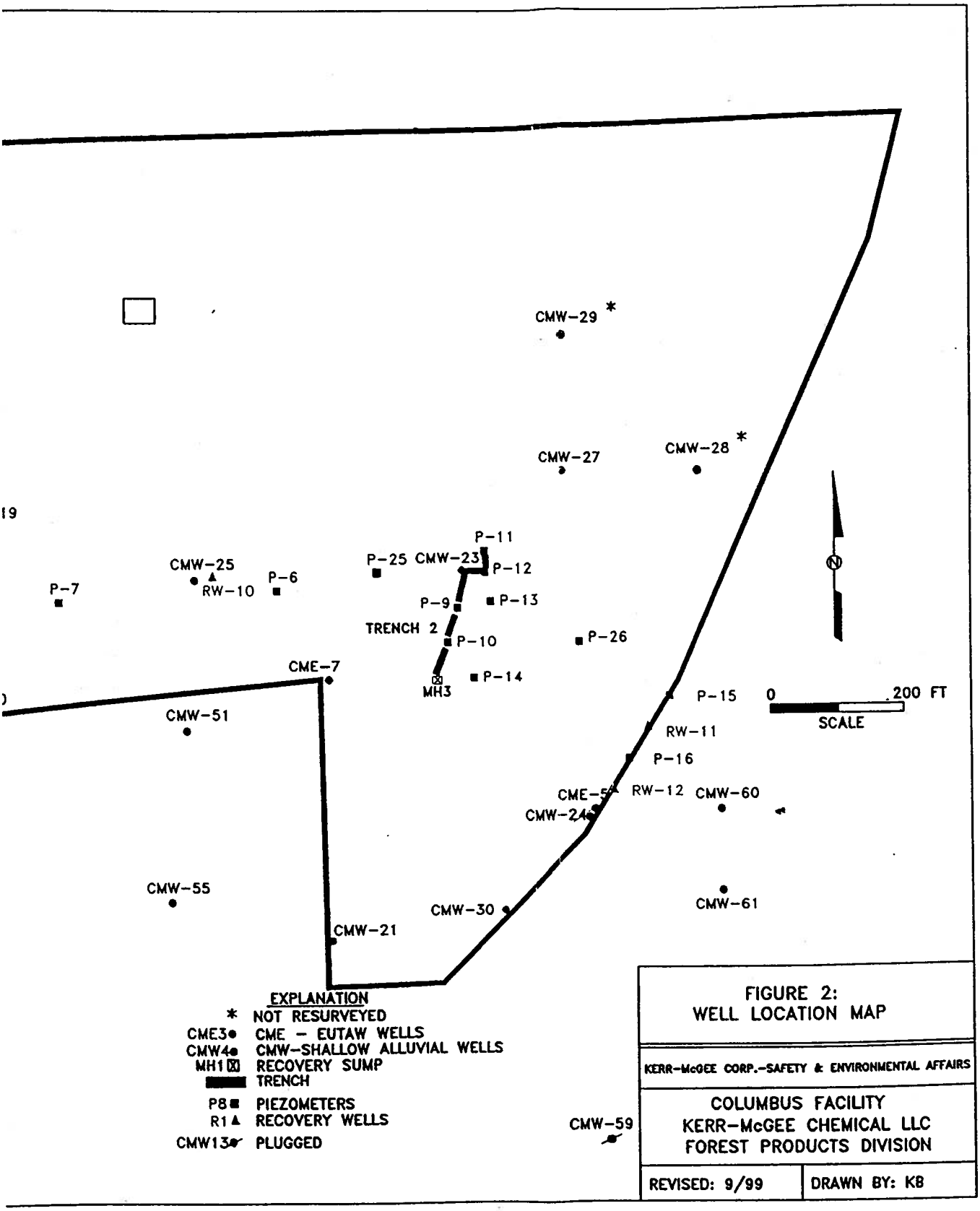
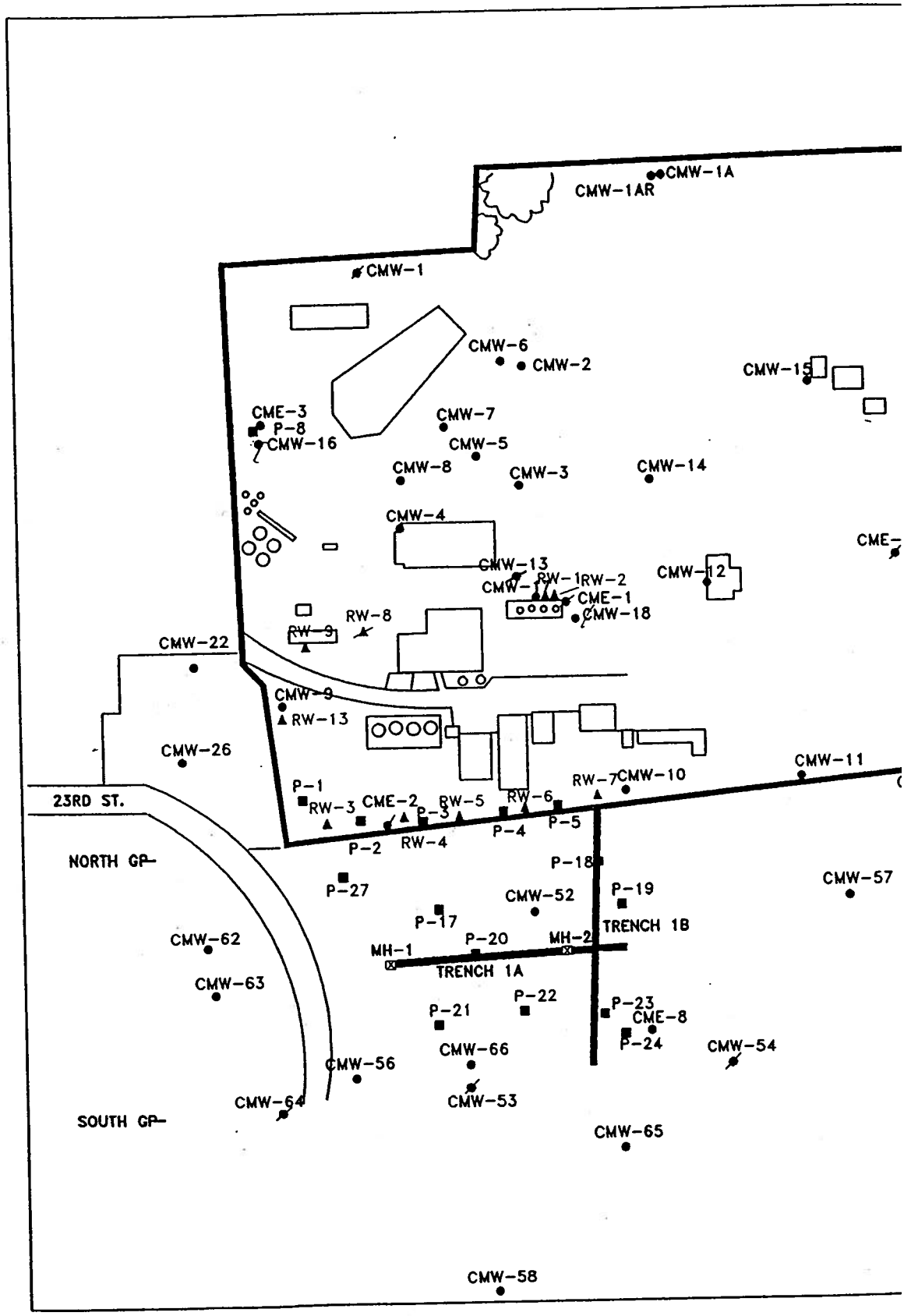


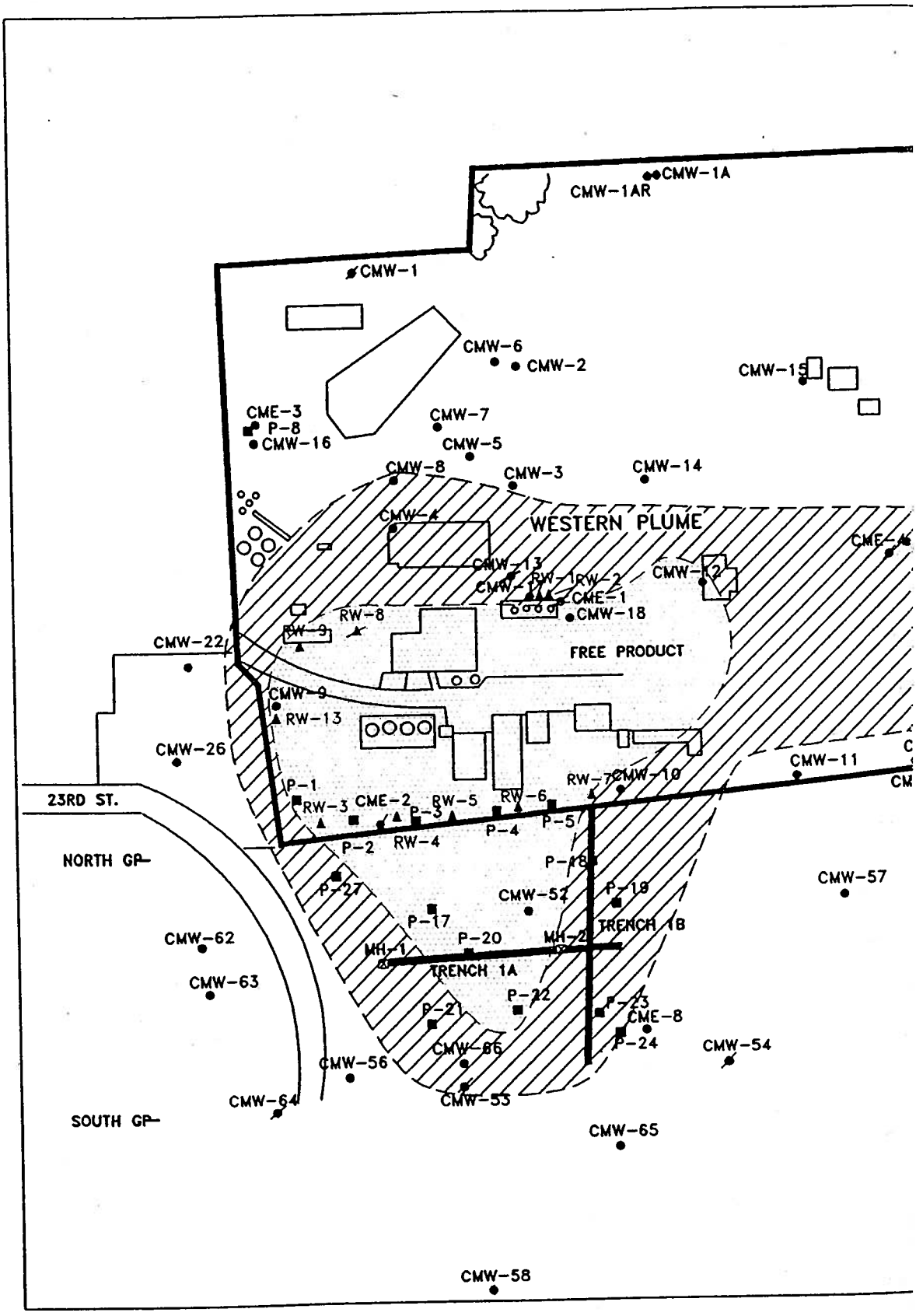
FIGURE 2:
WELL LOCATION MAP

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

REVISED: 9/99 | DRAWN BY: KB


CMW-1A
CMW-1AR
CMW-1
CMW-6
CMW-2
CMW-15
CME-3
P-8
CMW-16
CMW-7
CMW-5
CMW-8
CMW-3
CMW-14
CMW-4
CME-
CMW-13
RW-1
RW-2
CMW-12
CMW-17
CME-1
CMW-18
RW-8
RW-9
CMW-22
CMW-9
RW-13
CMW-26
CMW-11
P-1
23RD ST.
RW-3
CME-2
RW-5
RW-6
RW-7
CMW-10
P-3
P-4
P-5
P-2
RW-4
NORTH GP-
P-18
P-27
CMW-52
P-19
CMW-57
P-17
TRENCH 1B
CMW-62
P-20
MH-2
MH-1
TRENCH 1A
CMW-63
P-22
P-23
P-21
CME-8
P-24
CMW-66
CMW-54
CMW-56
CMW-53
CMW-64
SOUTH GP-
CMW-65
CMW-58


CMW-1A
CMW-1AR
CMW-1
CMW-6
CMW-2
CMW-15
CME-3
P-8
CMW-16
CMW-7
CMW-5
CMW-8
CMW-3
CMW-14
CMW-4
WESTERN PLUME
CMW-13
CMW-17
RW-1
RW-2
CME-1
CMW-18
CMW-12
RW-8
RW-9
CMW-22
FREE PRODUCT
CMW-9
RW-13
CMW-26
CMW-11
P-1
RW-3
CME-2
RW-5
RW-6
RW-7
CMW-10
P-3
P-4
P-5
P-2
RW-4
23RD ST.
NORTH GP
P-18
CMW-57
P-27
CMW-52
P-19
P-17
TRENCH 1B
CMW-62
MH-1
P-20
MH-2
TRENCH 1A
CMW-63
P-22
P-23
P-21
CME-8
CMW-66
P-24
CMW-54
CMW-56
CMW-64
CMW-53
SOUTH GP
CMW-65
CMW-58

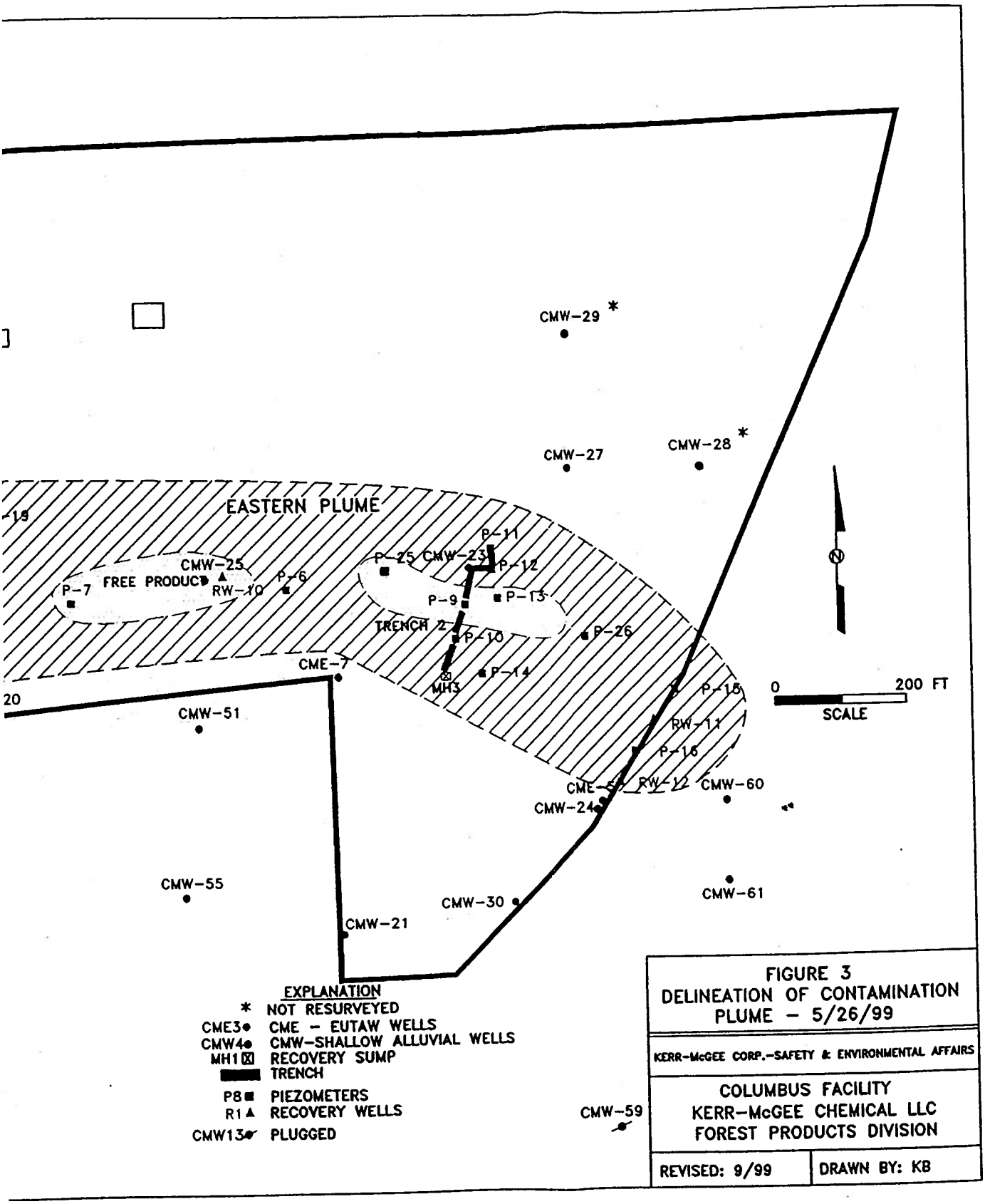


FIGURE 3
DELINEATION OF CONTAMINATION
PLUME – 5/26/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

REVISED: 9/99 | DRAWN BY: KB

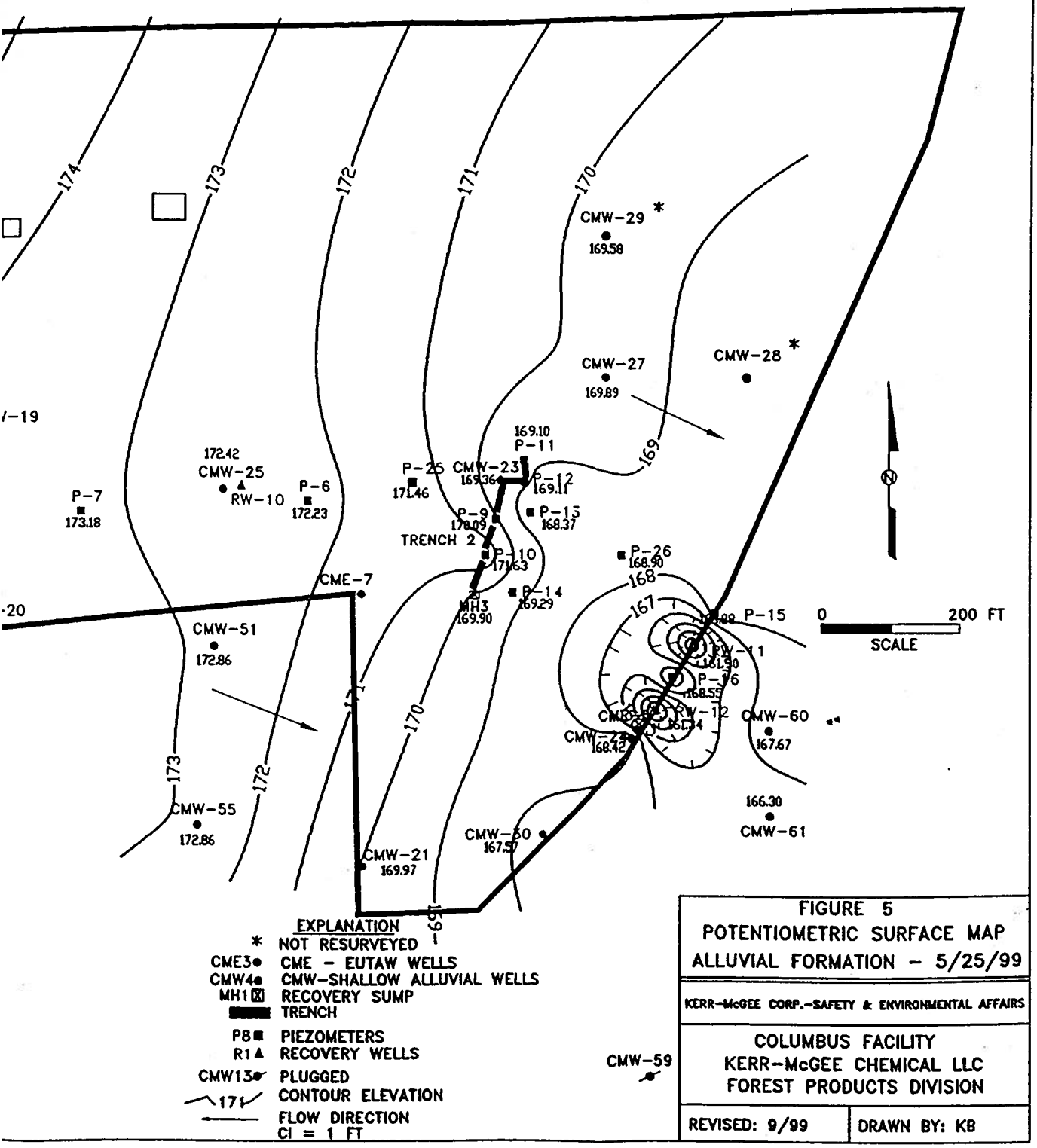


FIGURE 5
POTENTIOMETRIC SURFACE MAP
ALLUVIAL FORMATION – 5/25/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

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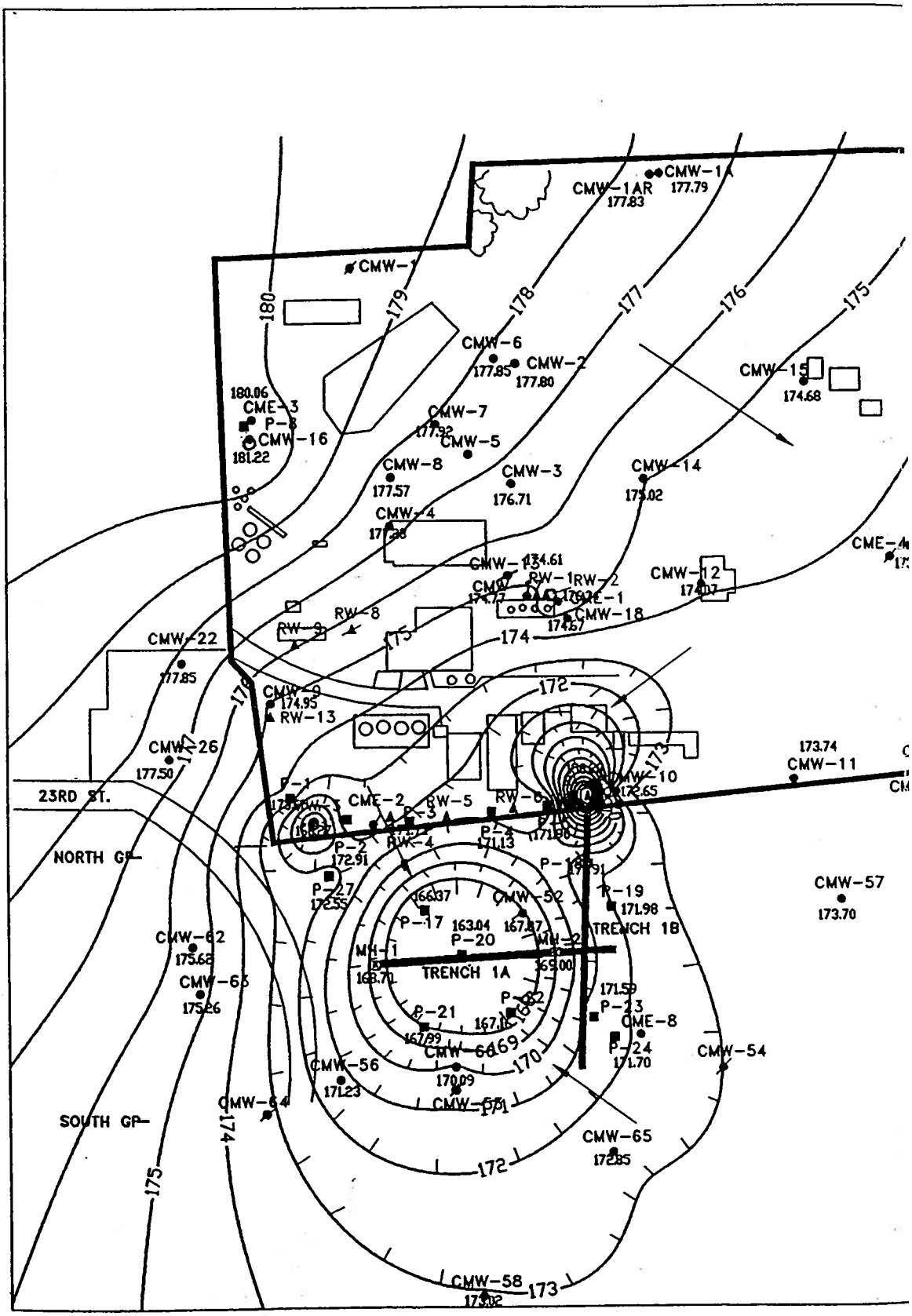
CMW-1
CMW-1AR 177.83
CMW-1A 177.79
CMW-6 177.85
CMW-2 177.80
CMW-15 174.68
CME-3
P-8
CMW-16 181.22
180.06
CMW-7 177.92
CMW-5
CMW-8 177.57
CMW-3 176.71
CMW-14 175.02
CMW-4
CMW-13 174.61
RW-1
RW-2
CMW-12
CME-1
CMW-18 174.67
RW-8
RW-9
CMW-22 177.85
CMW-9 174.95
RW-13
CMW-26 177.50
23RD ST.
P-1
CME-2
RW-5
RW-6
P-3
P-4 171.13
RW-4
P-2 172.91
NORTH GP
P-27 172.55
CMW-52
P-17 163.04
P-20
MH-1
TRENCH 1A
TRENCH 1B
P-19 171.98
CMW-62 175.68
CMW-63 175.26
P-21
P-23
CME-8
P-24 171.70
CMW-54
CMW-66
CMW-56 171.23
170.09
CMW-64
SOUTH GP
CMW-65 172.85
CMW-58 173.02
CMW-10 172.65
CMW-11 173.74
CMW-57 173.70
180
179
178
177
176
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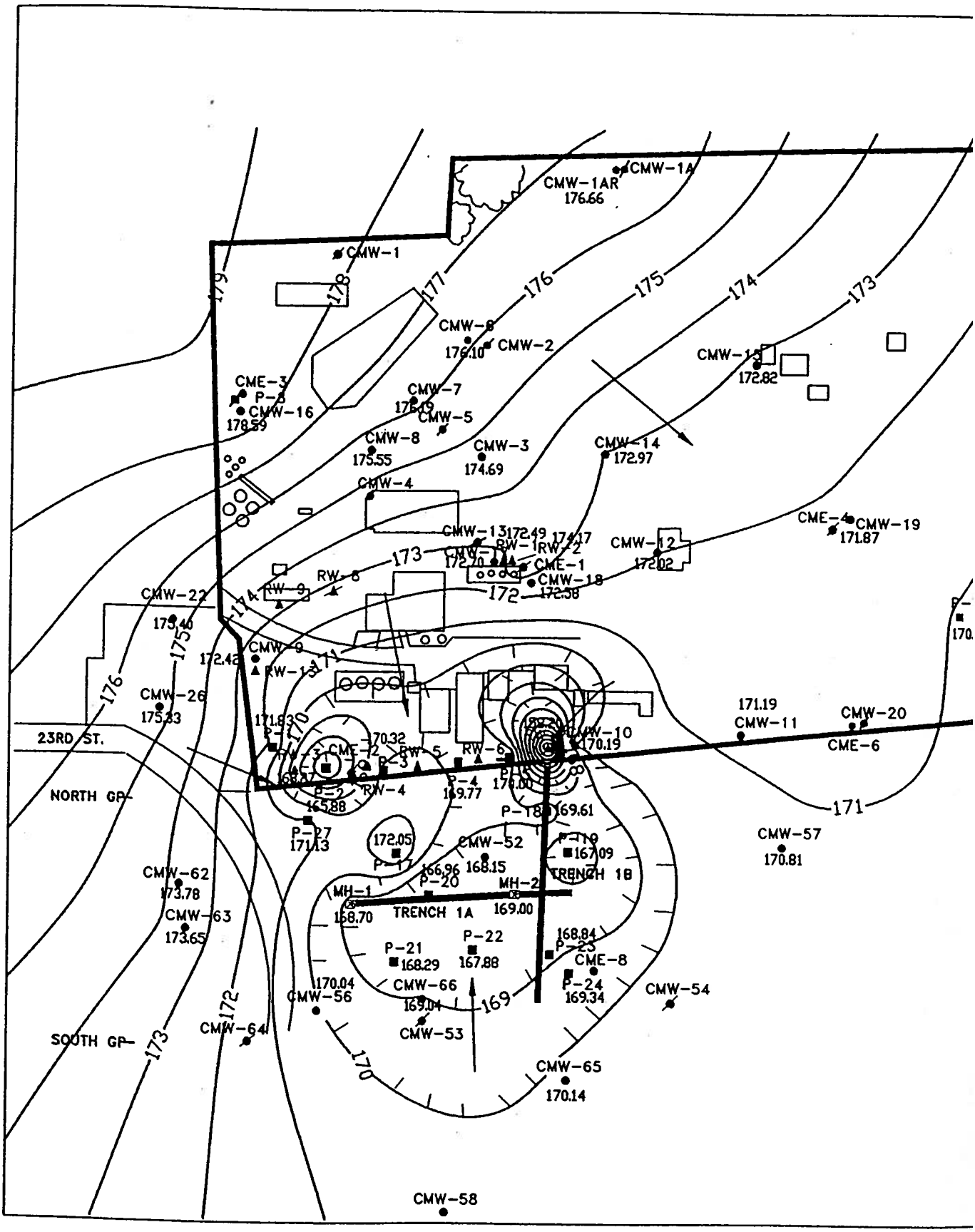
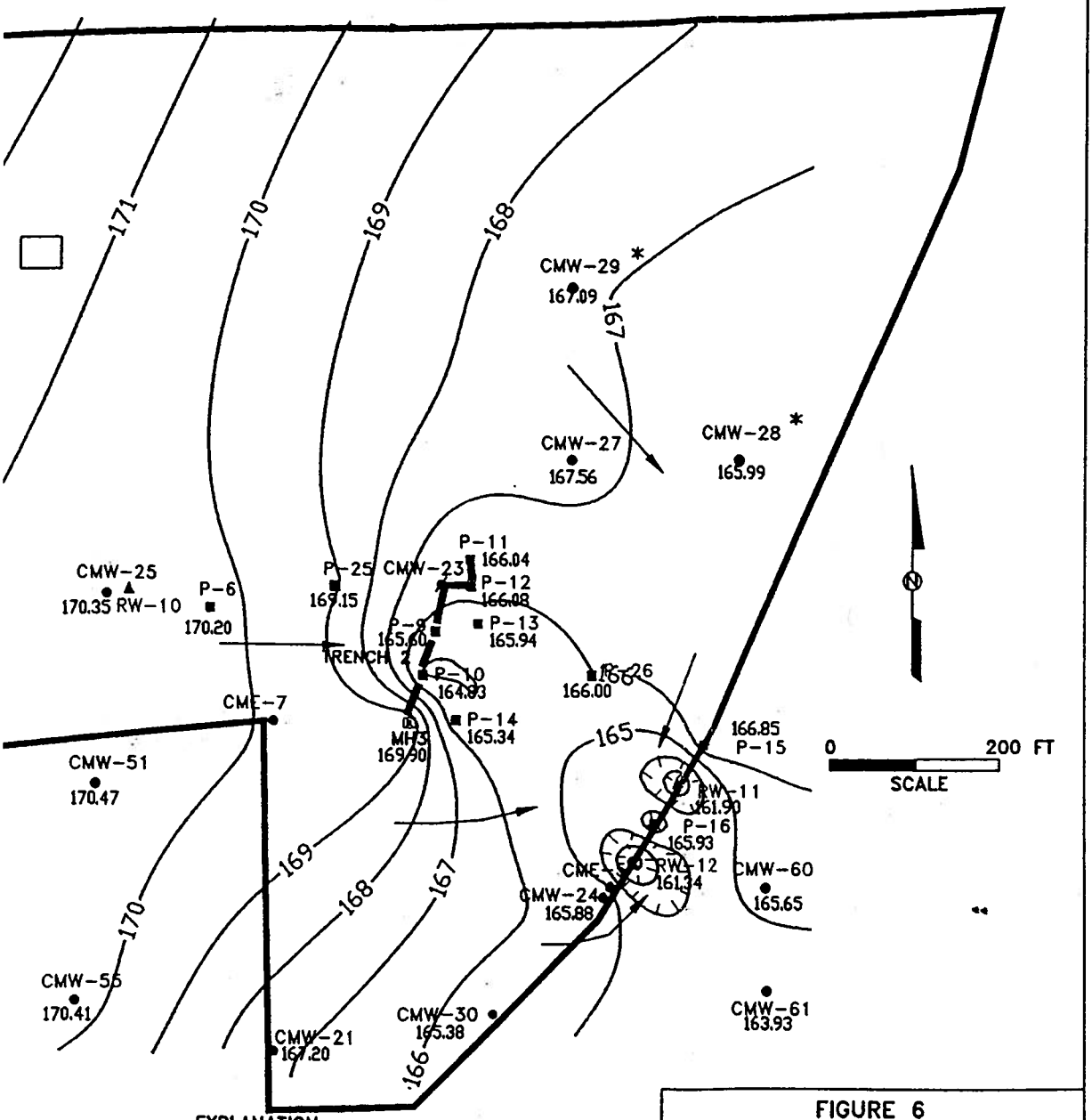
174
173
172
171
170
169


CMW-1A
CMW-1AR
176.66
CMW-1
CMW-6
176.10
CMW-2
CME-3
P-6
CMW-16
178.59
CMW-7
175.19
CMW-5
CMW-8
175.55
CMW-3
174.69
CMW-14
172.97
CMW-15
172.82
CMW-4
CMW-13
172.49
174.17
RW-1
RW-2
CMW-12
172.02
CME-4
CMW-19
171.87
CME-1
CMW-18
172.58
RW-8
RW-9
CMW-22
175.40
CMW-9
172.43
RW-7
CMW-26
175.33
171.83
P-1
170.32
CME-2
RW-3
RW-5
RW-6
P-3
RW-4
P-4
169.77
170.19
CMW-10
171.19
CMW-11
CMW-20
CME-6
23RD ST.
NORTH GP
P-18
169.61
P-27
171.13
172.05
P-17
CMW-52
168.15
P-19
167.09
TRENCH 1B
166.96
P-20
MH-2
MH-1
168.70
TRENCH 1A
169.00
CMW-62
173.78
CMW-63
173.65
P-21
168.29
P-22
167.88
168.84
P-23
CME-8
CMW-66
169.04
CMW-56
170.04
P-24
169.34
CMW-54
CMW-53
CMW-64
SOUTH GP
CMW-65
170.14
CMW-57
170.81
CMW-58
171
172
173
174
175
176
177
178
179
169
170



EXPLANATION

* NOT RESURVEYED
CME3● CME - EUTAW WELLS
CMW4● CMW-SHALLOW ALLUVIAL WELLS
MH1 ⊠ RECOVERY SUMP
TRENCH
P8■ PIEZOMETERS
R1▲ RECOVERY WELLS
CMW13● PLUGGED
171 CONTOUR ELEVATION
FLOW DIRECTION
CI = 1 FT

FIGURE 6
POTENTIOMETRIC SURFACE MAP
ALLUVIAL FORMATION - 11/9/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

REVISED: 2/00 | DRAWN BY: KB

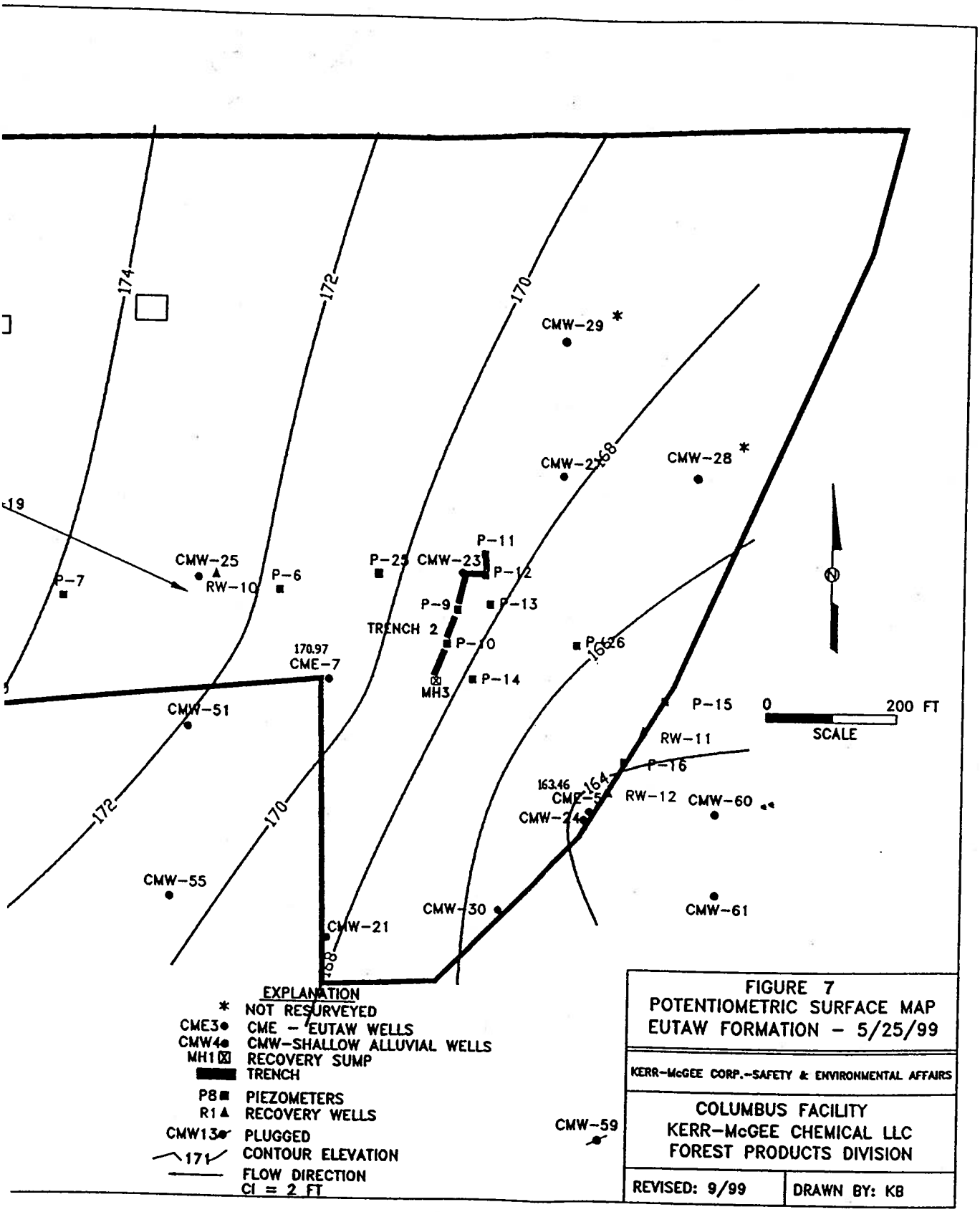
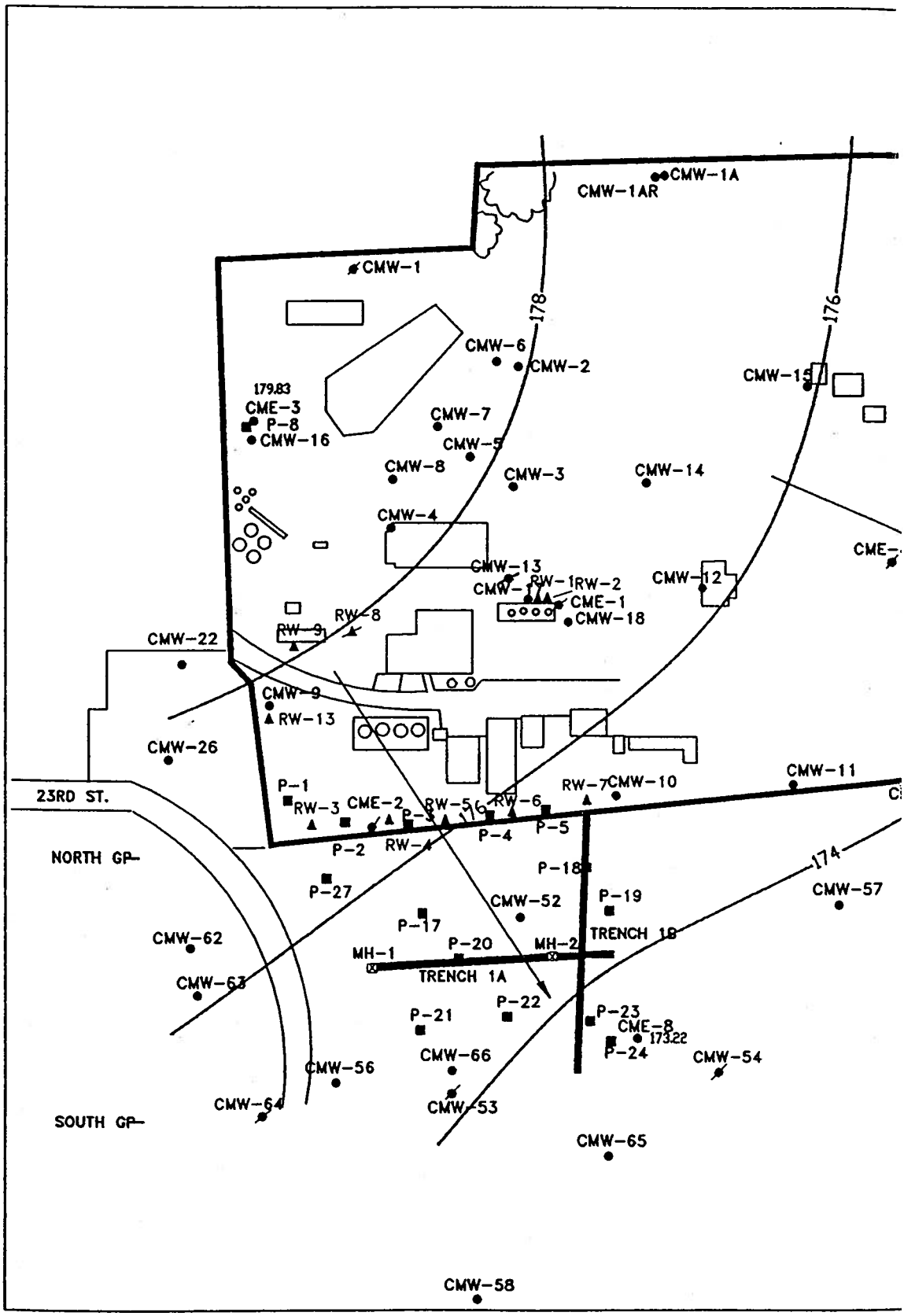


FIGURE 7
POTENTIOMETRIC SURFACE MAP
EUTAW FORMATION – 5/25/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

REVISED: 9/99 | DRAWN BY: KB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176
CMW-6
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CMW-7
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CMW-14
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CMW-13
CMW-
RW-1
RW-2
CMW-12
CME-1
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RW-8
RW-9
CMW-22
CMW-9
RW-13
CMW-26
23RD ST.
P-1
RW-3
CME-2
RW-5
RW-6
RW-7
CMW-10
CMW-11
P-2
RW-4
P-4
P-5
NORTH GP
P-18
P-27
CMW-52
P-19
CMW-57
P-17
CMW-62
MH-1
P-20
MH-2
TRENCH 1B
TRENCH 1A
CMW-63
P-22
P-21
P-23
CME-8
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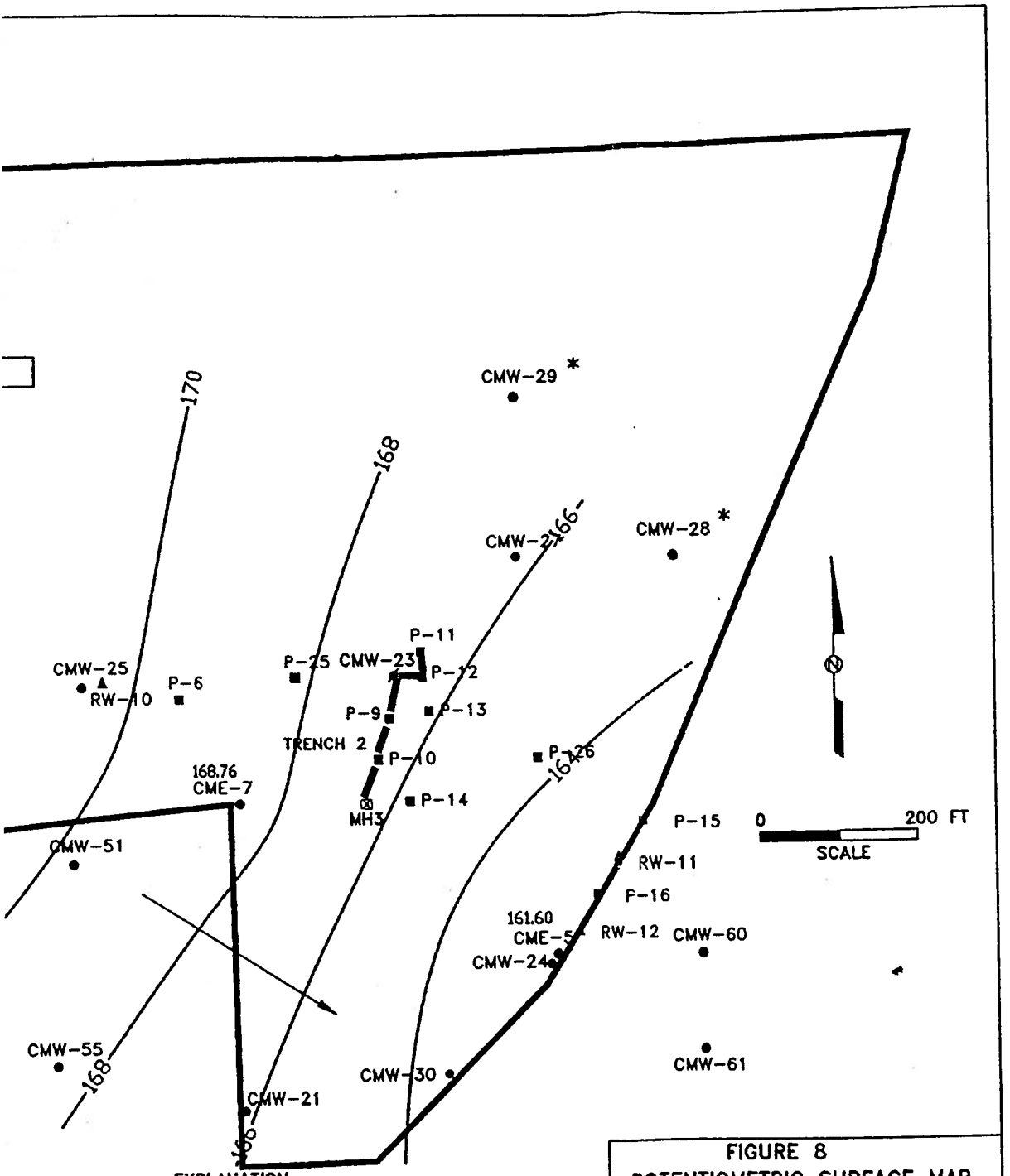
SOUTH GP
CMW-65
CMW-58



EXPLANATION

- * NOT RESURVEYED
- CME3● CME - EUTAW WELLS
- CMW4● CMW-SHALLOW ALLUVIAL WELLS
- MH1 ⊠ RECOVERY SUMP
- ▬▬ TRENCH
- P8■ PIEZOMETERS
- R1▲ RECOVERY WELLS
- CMW13● PLUGGED
- 171 CONTOUR ELEVATION
- FLOW DIRECTION
- CI = 1 FT

FIGURE 8
POTENTIOMETRIC SURFACE MAP
EUTAW FORMATION - 11/9/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

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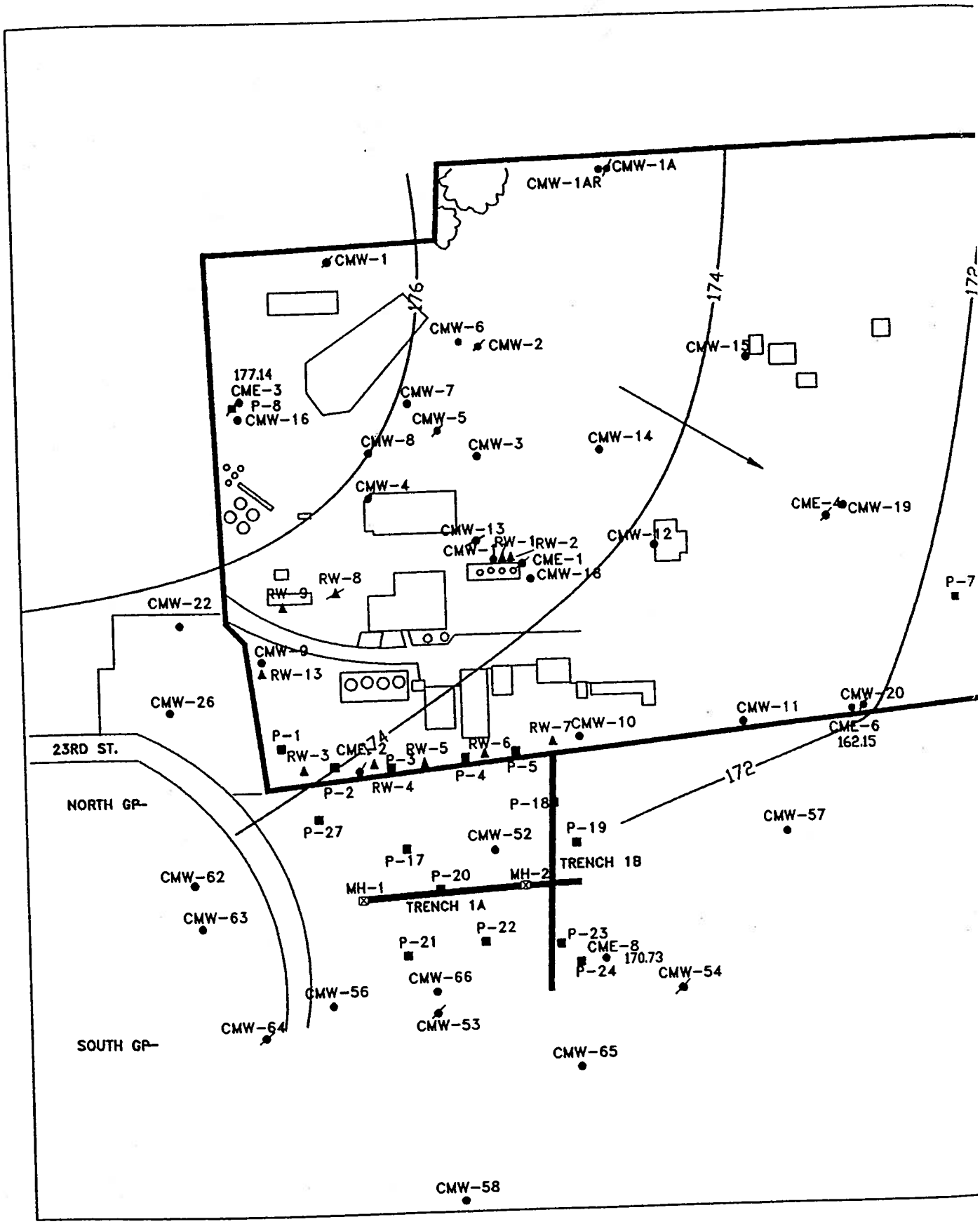
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CMW-6
CMW-2
174
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CME-3
P-8
CMW-16
CMW-7
CMW-5
CMW-8
CMW-3
CMW-14
CMW-4
CME-4
CMW-19
CMW-13
CMW-17
RW-1
RW-2
CME-1
CMW-18
CMW-12
RW-8
RW-9
P-7
CMW-22
CMW-9
RW-13
CMW-26
CMW-11
CMW-20
CME-6
162.15
P-1
RW-3
CME-2
RW-5
RW-6
RW-7
CMW-10
P-3
P-4
P-5
23RD ST.
172
P-2
RW-4
NORTH GP-
P-18
CMW-57
P-27
CMW-52
P-19
P-17
TRENCH 1B
CMW-62
P-20
MH-2
MH-1
TRENCH 1A
CMW-63
P-22
P-23
P-21
CME-8
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CMW-53
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SOUTH GP-
CMW-65
CMW-58

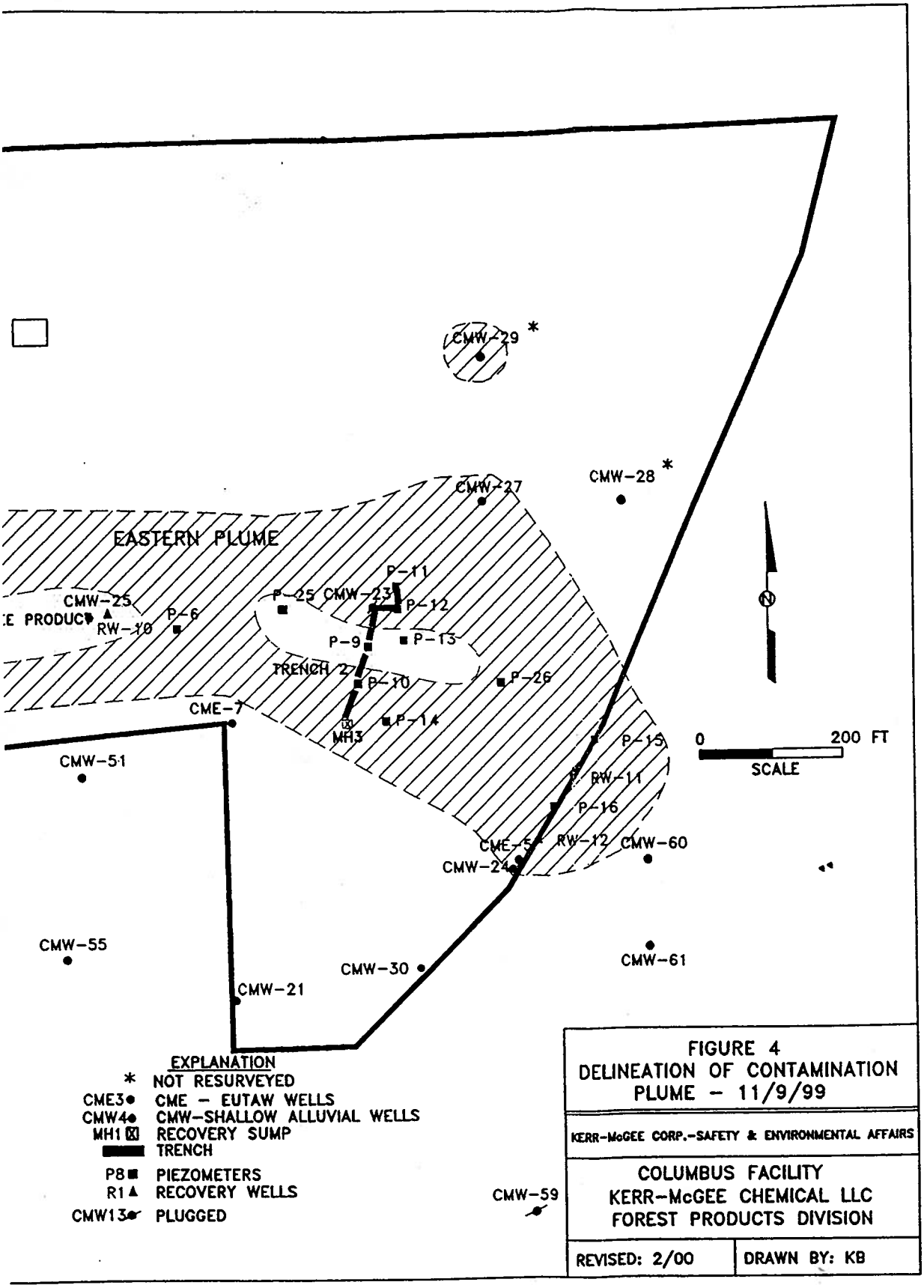

FIGURE 4
DELINEATION OF CONTAMINATION
PLUME – 11/9/99

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS

COLUMBUS FACILITY
KERR-McGEE CHEMICAL LLC
FOREST PRODUCTS DIVISION

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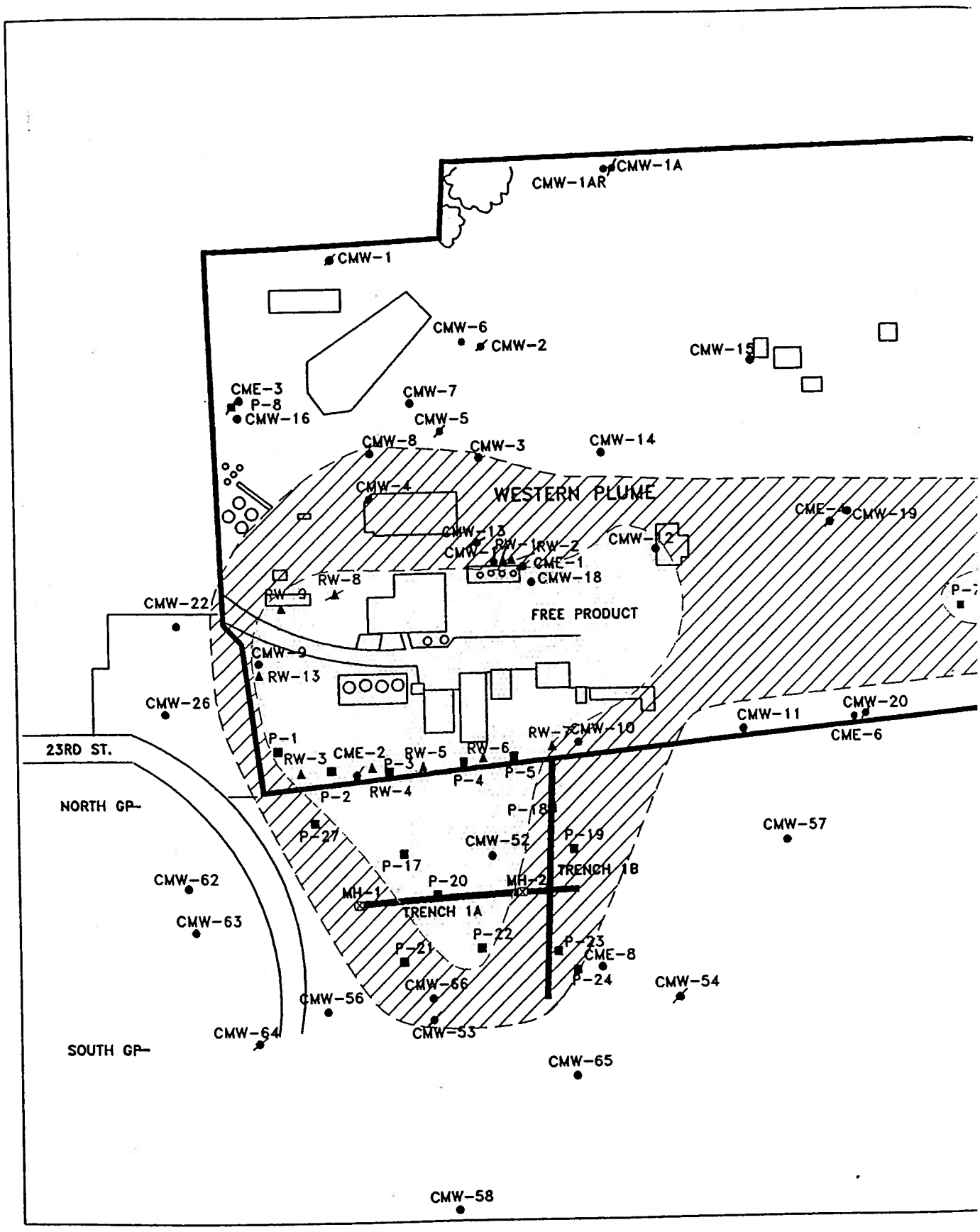
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CMW-6
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CMW-15
CME-3
P-8
CMW-16
CMW-7
CMW-5
CMW-8
CMW-3
CMW-14
CMW-4
WESTERN PLUME
CME-4
CMW-19
CMW-13
RW-1
RW-2
CMW-12
CME-1
CMW-18
RW-8
RW-9
CMW-22
FREE PRODUCT
CMW-9
RW-13
CMW-26
CMW-11
CMW-20
CME-6
23RD ST.
P-1
RW-3
CME-2
RW-5
RW-6
RW-7
CMW-10
P-3
P-4
P-5
P-2
RW-4
NORTH GP-
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P-17
TRENCH 1B
CMW-62
P-20
MH-2
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TRENCH 1A
CMW-63
P-22
P-21
P-23
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CMW-66
P-24
CMW-54
CMW-56
CMW-64
CMW-53
SOUTH GP-
CMW-65
CMW-58