KERR-McGEE CHEMICAL CORPORATION
POST OFFICE BOX 55 • HENDERSON, NEVADA 89015

October 26, 1982

CERTIFIED MAIL NO. P26 0233713

Mr. Bill Wilson, Chief
Technical Assessment Section
Toxics and Waste Programs Branch
U. S. Environmental Protection Agency
Region IX
215 Fremont Street
San Francisco, CA 94105

Re: Second Quarter 1982 RCRA Groundwater Monitoring Data, Henderson, Nevada Facility, Kerr-McGee Chemical Corporation, EPA ID No. NVD 008290330

Dear Mr. Wilson:

Please find attached in Tables I (landfill) and II (surface impoundments) completed second quarter 1982 RCRA groundwater monitoring data for the Kerr-McGee Chemical Corporation facility at Henderson, Nevada. These data supplement the partial data submitted on August 17, 1982. This data summary is supplied in accordance with 40 CFR 265.94(2)(i).

The cadmium concentration in all reported wells exceeds the NIPDWS limit of 0.01 mg/L. The turbidity limit of 1 NTU is also exceeded in all wells. Chromium exceeds the NIPDWS limit of .05 mg/L in the surface impoundment wells M-1, M-2, and M-3. Nitrate limits of 10 mg/L as N are exceeded in wells M-1, M-3, and M-4. The NIPDWS silver limit of 0.05 mg/L is exceeded in wells M-2 and M-3. In the landfill wells, the NIPDWS limit of 1.4-2.4 mg/L for fluoride is exceeded in M-5, M-6, and M-7. Coliform NIPDWS limits of 1/100 mL are exceeded in wells M-5, M-6, and M-7.

Sincerely,

R. B. Chase
Plant Manager

RBC:jc
Attachment

cc: H. L. Rosse-Carson City

TABLE I

SECOND QUARTER 1982 RCRA GROUNDWATER MONITORING DATA
KERR-MCGEE CHEMICAL CORPORATION - HENDERSON FACILITY

LANDFILL

Parameter		Upgradient Well M-5	Downgradient Wells M-6	M-7	H-28
Arsenic	(mg/L)	0.02	<0.01	<0.01	0.01
Barium	"	0.10	0.08	0.12	0.09
Cadmium	"	0.02	0.02	0.02	0.02
Chromium	"	0.01	0.01	<0.01	0.01
Fluoride	"	3.6	2.5	2.5	1.0
Lead	"	<0.01	0.02	<0.01	<0.01
Mercury	"	<0.001	<0.001	<0.001	0.012
Nitrate (as N)	"	0.45	0.22	0.22	0.2
Selenium	"	<0.005	<0.005	<0.005	<0.005
Silver	"	0.02	0.01	0.01	0.02
Endrin	"	<0.0002	<0.0002	<0.0002	<0.0002
Lindane	"	<0.004	<0.004	<0.004	<0.004
Methoxychlor	"	<0.1	<0.1	<0.1	<0.1
Toxaphene	"	<0.005	<0.005	<0.005	<0.005
2,4-D	"	<0.1	<0.1	<0.1	<0.1
2,4,5-TP Silvex	"	<0.01	<0.01	<0.01	<0.01
Gross Alpha	(pCi/L)	<40	<20	<40	<40
Gross Beta	(pCi/L)	40 ±30	40 ±20	60 ±20	50±20
Radium	(pCi/L)	<2	<2	<2	<2
Coliform	(MPN/100 mL)	240	93	4	<2.2
Turbidity	(NTU)	2000	2000	2000	35

Analysis by Truesdail Laboratories, Inc., Los Angeles, CA.

TABLE II

SECOND QUARTER 1982 RCRA GROUNDWATER MONITORING DATA
KERR-MCGEE CHEMICAL CORPORATION - HENDERSON FACILITY

SURFACE IMPOUNDMENTS

Parameter		Upgradient Well M-1	Downgradient Wells M-2	M-3*	M-4*
Arsenic	(mg/L)	<0.01	0.03	<0.01	<0.01
Barium	"	0.18	0.23	0.27	0.09
Cadmium	"	0.03	0.05	0.06	0.01
Chromium	"	12.9	10.0	44	0.01
Fluoride	"	0.7	1.0	0.7	1.0
Lead	"	<0.01	<0.01	<0.01	<0.01
Mercury	"	<0.001	<0.001	<0.001	<0.001
Nitrate (as N)	"	11.2	8.8	44	11.1
Selenium	"	<0.005	<0.005	<0.005	<0.005
Silver	"	0.04	0.10	0.09	0.03
Endrin	"	<0.0002	<0.0002	<0.0002	<0.0002
Lindane	"	<0.004	<0.004	<0.004	<0.004
Methoxychlor	"	<0.1	<0.1	<0.1	<0.1
Toxaphene	"	<0.005	<0.005	<0.005	<0.005
2,4-D	"	<0.1	<0.1	<0.1	<0.1
2,4,5-TP Silvex	"	<0.01	<0.01	<0.01	<0.01
Gross Alpha	(pCi/L)	<100	<100	<200	<40
Gross Beta	(pCi/L)	80±20	720±40	300±40	30±20
Radium	(pCi/L)	<2	<2	<2	<2
Coliform	(MPN/100 mL)	<2.2	<2.2	<2.2	<2.2
Turbidity	(NTU)	45	57	2.5	85

Analysis by Truesdail Laboratories, Inc., Los Angeles, CA.

* Monitor wells M-3 and M-4 were replaced by wells M-8 and M-9 following second quarter analysis.

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-1

Gradient Up: XX Down:

Report for: 19 82

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Address: P. O. Box 55, Henderson, Nevada Zip: 89015

TABLE 1 — Surface Impoundment

Parameter Units	Ground Water Elev. Ft. Sample Occurance	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
First Year (initial) Background Quarterly mean		**	**	**	**						
4/14/82	1751.63	7.3	11,350	4.3	528	1450	0.27	0.07	0.01	1260	868
7/1/82	1750.51	7.4	12,250	18.3	51.5	1625	0.16	0.04	<0.01	1085	1190
10/5/82	1750.72	7.3	11,600	21.3	615	2000	0.40	0.09	<0.01	1170	1120

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
4/14/82	0.01	0.21	0.03	12.2	1.0	<0.01	0.001	0.91	<0.005	0.04
7/1/82	<0.01	0.18	0.03	12.9	0.7	<0.01	<0.001	11.2	<0.005	0.04
10/5/82	<0.01	0.20	0.03	12.7	1.0	<0.01	<0.001	18.7	<0.005	0.02

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria 1/100 ml
Date										
4/14/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<15	<20	<2.2
7/1/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<100	80±20	<2.2
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<50	50±30	<2.2

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-2

Gradient Up [ ] Down [xx]

Report for: 19 | 8 | 2 |

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Address: P. O. Box 55 Henderson, Nevada Zip: 89015

TABLE 1 Surface Impoundment

Parameter Units	Ground Water Elev. Ft. Sample Occurence	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
First Year (initial) Background statistic mean		**	**	**	**						
/14/82	1746.77	7.3	20,000	5	870	3800	0.03	0.04	<0.01	4430	2900
/1/82	1744.40	7.2	34,000	9	23	7210	0.27	0.05	<0.01	6350	4180
9/5/82	1746.35	7.3	22,000	45	59	4750	0.34	0.07	<0.01	4190	1190

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
14/82	0.02	0.18	0.04	9.0	0.95	<0.01	<0.001	0.45	<0.005	0.05
/1/82	0.03	0.23	0.05	10.0	1.0	<0.01	<0.001	8.8	<0.005	0.10
9/5/82	0.02	0.13	0.04	9.15	2.0	<0.01	<0.001	14.7	<0.005	0.03

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria #/100 ml
Date										
/14/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<3	<15	<20	<2.2
2/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<100	720±40	<2.2
9/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<60	300±100	<2.2

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

GROUND WATER MONITORING REPORT FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-8

Gradient Up [ ] Down [X]

Report for: 19 8 2

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Business Address: P. O. Box 55 Henderson, NV Zip: 89015

Surface Impoundment

TABLE 1

Parameter Units	Ground Water Elev. Ft. Sample Occurance	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
*First Year (initial) Background Arithmetic mean		**	**	**	**						
10/5/82	1746.62	7.1	11,000	54	435	2000	0.22	0.12	<0.01	1490	1680

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
10/5/82	0.01	0.23	0.02	5.1	2.0	<0.01	<0.001	14.7	<0.005	0.02

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria f/100 ml
Date										
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<30	100±60	<2.2

EPA TSD Fac. No. or Gen. No.: N V D 0 0 8 2 9 0 3 3 0

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-9

Gradient Up: [ ] Down: XX

Report for: 19 8 2

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Address: P. O. Box 55 - Henderson, Nevada Zip: 89015

Surface Impoundment

TABLE 1

Parameter Units	Ground Water Elev. Ft. Sample Occurance	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
First Year (initial) Background Estimate mean		**	**	**	**						
10/5/82	1745.15	7.0	40,500	11	1200	12,120	0.29	0.27	<0.01	9520	1510

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
10/5/82	0.03	0.23	0.07	16.3	1.0	<0.01	<0.001	14.7	<0.005	0.06

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria 1/100 ml
Date										
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<200	1200±300	<2.2

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

Company Well Number: M-5

Gradient Up [X] Down [ ]

Report for: 19 8 2

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Address: P. O. Box 55 Henderson, Nevada Zip: 89015

Landfill

TABLE 1

Parameter Units	Ground Water Elev. Ft. Sample Occurence	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic + Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
** First Year (initial) Background arithmetic mean		**	**	**	**						
6/16/82	1716.49	6.5	10,500	126	35	2750	22.19	8.94	0.17	1010	2350
10/5/82	1716.32	5.8	10,550	25	32	3000	58.5	5.22	0.30	1120	1360

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
6/16/82	0.02	0.10	0.02	0.01	3.6	<0.01	<0.001	0.45	<0.005	0.02
10/5/82	<0.01	0.15	0.02	0.02	2.0	<0.01	<0.001	0.10	<0.005	0.02

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria #/100 ml
Date										
6/16/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<40	40±30	240
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<30	<40	<2.2

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-6

Gradient Up [ ] Down [X]

Report for: 19 | 8 | 2 |

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Address: P. O. Box 55 - Henderson, NV Zip: 89015

TABLE 1 — Landfill

Parameter Units	Ground Water Elev. Ft. Sample Occurance	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
First Year (initial) Background Quarterly mean		**	**	**	**						
/16/82	1697.82	6.6	9600	47	8	2270	9.73	6.51	0.06	1060	2550
/5/82	1697.57	6.4	9500	80	12	2370	15.9	2.88	<0.01	1150	1170

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
/16/82	<0.01	0.08	0.02	0.01	2.5	0.02	<0.001	0.22	<0.005	0.01
/5/82	<0.01	0.10	0.02	0.02	1.0	<0.01	0.001	0.10	<0.005	0.03

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria f/100 ml
Date										
/16/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<20	40±20	93
/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<50	300±100	<2.2

EPA TSD Fac. No. or Gen. No. | N | V | D | 0 | 0 | 8 | 2 | 9 | 0 | 3 | 3 | 0 |

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: M-7

Gradient Up [ ] Down [X]

Report for: 19 8 2

Company Name: Kerr-McGee Chemical Corporation Phone: (702) 565-8901

Business Address: P. O. Box 55 Henderson, Nevada Zip: 89015

Landfill

TABLE 1

Parameter Units	Ground Water Elev. Ft. Sample Occurence	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Note											
* First Year (initial) Background Isomatic mean		**	**	**	**						
6/16/82	1701.83	6.8	10,000	50	9	2300	4.87	4.28	0.08	1180	2500
10/5/82	1701.60	6.7	10,000	29	12	4870	13.8	2.61	0.01	1190	1280

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Note										
6/16/82	<0.01	0.12	0.02	<0.01	2.5	<0.01	<0.001	0.22	<0.005	0.01
10/5/82	<0.01	0.18	0.02	<0.01	1.0	<0.01	0.001	0.10	<0.005	0.02

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria f/100 ml
Note										
6/16/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<40	60±20	4
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<20	<40	16

EPA TSD Fac. No. or Gen. No.: NVD008290330

GROUND WATER MONITORING REPORT
FOR HAZARDOUS WASTE FACILITIES

Company Well Number: H-28

Gradient Up: [ ] Down: [XX]

Report for: 19 82

Company Name: Kerr-McGee Chemical Corporation

Phone: (702) 565-8901

Address: P. O. Box 55 Henderson, NV

Zip: 89015

Landfill

TABLE 1

Parameter Units	Ground Water Elev. Ft. Sample Occurence	pH Standard	Conductivity µmhos mg/l	Total Organic Carbon mg/l	Total Organic Halogen mg/l	Chloride mg/l	Iron mg/l	Manganese mg/l	Phenols mg/l	Sodium mg/l	Sulfate mg/l
Date											
First Year (initial) Background Geometric mean		**	**	**	**						
7/9/82	1699.81	7.0	10,500	3	23	2130	0.21	2.42	<0.01	1680	730
8/1/82	1698.71	7.5	8,800	18	7.9	2140	2.28	2.16	<0.01	1195	2110
10/5/82	1698.33	7.5	9,000	4	11	2250	0.61	1.77	<0.01	1110	1190

TABLE 2

Parameter Units	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Fluoride mg/l	Lead mg/l	Mercury mg/l	Nitrate mg/l (as N)	Selenium mg/l	Silver mg/l
Date										
7/9/82	0.47	0.08	0.02	0.03	0.55	<0.01	<0.001	<0.1	<0.005	0.02
8/1/82	0.01	0.09	0.02	0.01	1.0	<0.01	0.012	0.2	<0.005	0.02
10/5/82	0.02	0.08	0.02	0.02	2.0	<0.01	<0.001	0.53	<0.005	0.01

Parameter Units	Endrin mg/l	Lindane mg/l	Methoxychlor mg/l	Toxaphene mg/l	2,4-D mg/l	2,4,5-TP Silvex mg/l	Radium pCi/l	Gross Alpha pCi/l	Gross Beta pCi/l	Coliform Bacteria #/100 ml
Date										
7/9/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	81	<40	<2.2
8/1/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<40	50+20	<2.2
10/5/82	<0.0002	<0.004	<0.1	<0.005	<0.1	<0.01	<2	<40	60+40	<2.2

KERR-McGEE CHEMICAL CORPORATION
POST OFFICE BOX 55 • HENDERSON, NEVADA 89015

August 6, 1982

CERTIFIED MAIL NO. P26 0233706

Mr. H. Laverne Rosse
Program Director - Waste Management
State of Nevada
Division of Environmental Protection
Capitol Complex
Carson City, NV 89710

Dear Mr. Rosse:

Enclosed is Kerr-McGee Chemical Corporation's first quarter 1982 RCRA groundwater monitoring data. Through an oversight, this report was not mailed to you when it was issued.

Sincerely,

C. B. Armstrong
Plant Manager

CBA:jc
Enclosure

KERR-McGEE CHEMICAL CORPORATION
POST OFFICE BOX 55 • HENDERSON, NEVADA 89015

May 14, 1982

CERTIFIED MAIL - NO. P26 0233534
RETURN RECEIPT REQUESTED

Mr. Bill Wilson, Chief
Technical Assessment Section
Toxics and Waste Programs Branch
U. S. Environmental Protection Agency
Region IX
215 Fremont Street
San Francisco, CA 94105

Re: First Quarter 1982 RCRA Groundwater Monitoring Data

Dear Mr. Wilson:

Please find attached in Table I, first quarter 1982 RCRA groundwater monitoring data for the Kerr-McGee Chemical Corporation facility in Henderson, Nevada. This data summary is supplied in accordance with 40 CFR 265.94(2)(i).

The arsenic concentration in downgradient well H-28 exceeds the EPA National Interim Primary Drinking Water Standard (NIPDWS) of 0.05 mg/l. The NIPDWS level of 0.01 for cadmium is exceeded in all wells except downgradient well M-4, while the NIPDWS level for chromium of 0.05 mg/l is exceeded in all wells except downgradient well H-28. The silver concentration in downgradient well M-3 also exceeds the NIPDWS level of 0.05 mg/l.

Additionally, the NIPDWS gross alpha level of 15 PCI/l is exceeded in well H-28. At this time we are investigating possible causes for these exceedances. No other values exceed NIPDWS levels.

Sincerely,

C. B. Armstrong
Plant Manager

CBA:jc
Attachment

cc: H. L. Rosse - Certified Mail No. P26 0233706
Division of Environmental Protection
Carson City, NV 89710

TABLE I

FIRST QUARTER 1982 RCRA GROUNDWATER MONITORING DATA

DRINKING WATER PARAMETERS

KERR-McGEE CHEMICAL CORPORATION

Henderson, Nevada Facility

Parameter	Upgradient Well M-1	Downgradient Wells M-2	M-3	M-4	H-28
Arsenic (mg/l)	0.01	0.02	0.02	<0.01	0.47
Barium	0.21	0.18	0.37	<0.12	0.08
Cadmium	0.03	0.04	0.06	0.01	0.02
Chromium	12.2	9.0	31.1	0.18	0.03
Fluoride	1.00	0.95	1.00	1.00	0.55
Lead	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	<0.001	0.001	0.001	<0.001
Nitrate (as N)	0.91	0.45	<0.10	0.80	<0.10
Selenium	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	0.04	0.05	0.06	0.02	0.02
Endrin	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Lindane	<0.004	<0.004	<0.004	<0.004	<0.004
Methoxychlor	<0.01	<0.1	<0.1	<0.1	<0.1
Toxaphene	<0.005	<0.005	<0.005	<0.005	<0.005
2, 4-D	<0.10	<0.10	<0.10	<0.10	<0.10
2, 4, 5-TP Silvex	<0.01	<0.01	<0.01	<0.01	<0.01
Total Radium (PCI/1)	<2	<3	<2	<2	<2
Gross Alpha (PCI/1)	<15	<15	<15	<15	81
Gross Beta (PCI/1)	<20	<20	<20	<20	<40
Coliform Bacteria (#/100 ml)	<2.2	<2.2	<2.2	<2.2	<2.2
pH	7.3, 7.3 7.3, 7.3	7.3	7.3	7.6	7.0

CBA
5/14/82

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-5
Well Construction and Completion Table

Date Started	June 1, 1982
Date Completed	June 3, 1982 (except for surface grout)
Location	Approx. 100' South of landfill
Elevation from Top of Well Cover	1747.83'
Drilling Method	Rotary rig
Drilling Fluid	Revert
Depth to Muddy Creek	31'
Total Depth of Well	43'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel pipe
Well Casing Interval	39' to surface
Perforated Interval	39' - 29'
Perforation Type/ Size /Open Area	Factory slot/ 1/8" x 2" /4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	43' - 28'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	22' to surface (grout)
Completion:	0.-22.0' grout 22.0'-24.0' well cuttings 24.0'-28.0' bentonite pellets 28.0'-43.0' gravel pack
Comments: Open hole with gravel from 43.0' to 39.0' Steel 6-inch well cover with cap cemented in place 6-16-82	

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-6
Well Construction and Completion Table

Date Started	June 2, 1982
Date Completed	June 3, 1982 (except for surface grout)
Location	NW corner of landfill
Elevation from Top of Well Cover	1729.17'
Drilling Method	Rotary rig
Drilling Fluid	Revert
Depth to Muddy Creek	32'
Total Depth of Well	43'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel pipe
Well Casing Interval	34' to surface
Perforated Interval	35' - 25'
Perforation Type/ Size /Open Area	Factory slot/ 1/8" x 2" / 4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	43' -22'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	15' to surface
Completion:	0 -15.0' grout 15.0'-18.0' well cuttings 18.0'-22.0' bentonite pellets 22.0'-43.0' gravel pack
Comments: Open hole with gravel from 43.0' to 35.0'. Steel well cover with cap cemented in place on 6-16-82.	

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-7
Well Construction and Completion Table

Date Started	June 3, 1982
Date Completed	June 3, 1982 (except for surface grout)
Location	Approx. 120' east of M-6
Elevation from Top of Well Cover	1729.83'
Drilling Method	Rotary rig
Drilling Fluid	Revert
Depth to Muddy Creek	29.5'
Total Depth of Well	37'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel pipe
Well Casing Interval	34' to surface
Perforated Interval	35' - 25'
Perforation Type/ Size /Open Area	Factory slot / 1/8" x 2" /4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	37' - 22'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	15' to surface
Completion:	0 -15.0' grout 15.0'-18.0' well cuttings 18.0'-22.0' bentonite pellets 22.0'-37.0' gravel pack
Comments: Open hole with gravel from 35.0' to 37.0' Steel well cover with cap cemented in place 6-16-82.	

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-8
Well Construction and Completion Table

Date Started	June 14, 1982
Date Completed	June 15, 1982 (except for surface grout)
Location	NE corner of S-1 pond
Elevation from Top of Well Cover	1780.00'
Drilling Method	Rotary rig
Drilling Fluid	Revert
Depth to Muddy Creek	42.5'
Total Depth of Well	45'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel
Well Casing Interval	40' to surface
Perforated Interval	40' - 30'
Perforation Type/ Size /Open Area	Factory slot/ 1/8" x 2" /4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	45' - 27.5'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	22' to surface
Completion:	0 -22.0' grout 22.0'-24.0' well cuttings 24.0'-27.5' bentonite pellets 27.5'-45.0' gravel pack
Comments: Open hole with gravel from 40.0' to 45.0'. Steel well cover with cap cemented in place on 6-16-82.	

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-9
Well Construction and Completion Table

Date Started	June 15, 1982
Date Completed	June 15, 1982 (except for surface grout)
Location	NW corner of S-1 pond
Elevation from Top of Well Cover	1778.92'
Drilling Method	Rotary Rig
Drilling Fluid	Revert
Depth to Muddy Creek	42'
Total Depth of Well	45'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel pipe
Well Casing Interval	40' to surface
Perforated Interval	40' - 30'
Perforation Type/ Size /Open Area	Factory slot/ 1/8" x 2" /4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	45' - 28'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	22' to surface
Completion:	0 - 22.0' grout 22.0'- 24.0' well cuttings 24.0'- 28.0' bentonite pellets 28.0'- 45.0' gravel pack
Comments: Open hole with gravel from 45.0' to 40.0'. Steel well cover with cap cemented in place on 6-18-82.	

WELL CONSTRUCTION DETAILS

WELL H-28

Depth: 51 feet

Borehole Diameter: 10 inches

Casing Diameter and Type: 6" steel I.D.

Casing Length: 51.7 feet

Top of Casing Eelvation: 1730.33

Screened Interval: 37.4 to 50.5 feet, 6" factory slotted steel well screen

Gravel Pack Interval: 28 to 51.7 feet

Seal Interval: 0-28 feet: cement

Date Completed: 12-18-80

Data from Geraghty and Miller, Inc., 1980.

KERR-McGEE CORPORATION
INTERNAL CORRESPONDENCE

TO Distribution DATE November 18, 1981

FROM T. L. Bentley/S. M. Logan SUBJECT RCRA Groundwater Quality Assessment Outline

A written outline for a groundwater quality assessment program is required by RCRA for hazardous waste surface impoundments, landfills and landfarms by November 19, 1981 (45 FR 33241). This outline would be used if a groundwater quality assessment is ever required.

Attached is an outline to be kept on file at each of your facilities.

Terry L Bentley

T. L. Bentley
Environmental Affairs

S. M. Logan

S. M. Logan
Engineering Services

TLB/SML/dp

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CORPORATE

GROUNDWATER QUALITY ASSESSMENT PROGRAM OUTLINE

I. Evaluate Actual and Potential Migration of Hazardous Waste (HW) from the Existing HW Management Area.

A. Evaluate physical and chemical characteristics of groundwater from monitoring well data.

B. Identify and characterize alternate sources of HW that may influence the site.

1. Existing and Historical on-site
2. Existing and Historical off-site

C. Evaluate construction details, operating procedures and operating history of the HW facility.

D. Perform a water balance (if possible) around the HW management area.

E. Examine water levels adjacent to the HW facility.

II. Define Hydrogeologic Environment

A. Potentially impacted aquifer(s):

1. Depth
2. Thickness
3. Areal Extent
   a. local recharge and discharge points
   b. determine groundwater usage of aquifer(s)

B. Estimate aquifer parameters:

1. Transmissivity
2. Storage coefficient
3. Hydraulic conductivity
4. Effective porosity

C. Estimate local and regional directions and average velocities of groundwater flow:

1. Develop potentiometric maps of aquifer systems using water levels from current monitoring points.
2. Develop depth-to-water maps.

III. Define an Expanded Monitoring Well System

A. Review historical groundwater data (if any).

B. Establish locations and depths for new monitoring wells to delineate boundaries of impacted areas.

C. Sample and analyze monitoring wells for the HW constituents at the facility.

1. Determine parameters
2. Determine sampling and analysis procedures
3. Determine frequency of sampling

IV. Evaluate Impact from Existing HW Management Area

A. Evaluate physical and chemical characteristics of groundwater and determine concentrations of HW constituents.

B. Estimate rate of HW migration.

C. Estimate extent of HW migration.

D. Interpret analytical results in terms of water quality criteria and other applicable regulations.

E. Assess significance of analytical data in terms of compliance requirements.

V. Prepare Schedule of Implementation

A. Submit assessment plan of EPA or to the State if it has obtained RCRA interim authorization.

B. Install additional monitoring wells.

C. Initiate sampling and analysis.

D. Evaluate analytical and physical data.

E. Install additional wells, if necessary, and monitor.

F. Estimate area impacted from existing HW Management Area.

G. Submit assessment report to EPA or to the State if it has obtained RCRA interim authorization.

DESERT RESEARCH INSTITUTE
UNIVERSITY OF NEVADA SYSTEM

Kerr-McGee Pond Sampling Program

By

E. N. Cooper
B. Elliott
R. H. French

May, 1982

WATER RESOURCES CENTER

Table 1: Summary of Laboratory Analyses

Sample Site	Sample Type	As mg/ℓ	Se mg/ℓ	Ba mg/ℓ	Cd mg/ℓ	Total Cr mg/ℓ	Cr^{+6} mg/ℓ	Ag mg/ℓ	Pb mg/ℓ	Hg mg/ℓ
AP1	Liquor	0.05<	0.04	0.8	0.05<	0.30	0.2<	0.32	0.5<	0.005<
	Sludge	0.05<	0.04<	0.5<	0.05<	0.30	0.2<	0.05<	0.5<	0.005<
AP2	Liquor	0.05<	0.06	0.8	0.08	0.48	0.2<	0.63	0.5<	0.005<
	Sludge	0.05<	0.04<	0.5<	0.05<	0.60	0.2<	0.05<	0.5<	0.005<
AP4	Liquor	0.05<	0.04<	0.6	0.05<	0.20	0.2<	0.15	0.5<	0.005<
	Sludge	0.05<	0.04<	0.6	0.05<	0.20	0.2<	0.05<	0.5<	0.005<

WATER ANALYSIS LABORATORY
DESERT RESEARCH STITUTE

REPORT DATE: 22-MAR-83
FI : NAME: 5608KG.TBL

LAB # / DATE	SAMPLE POINT	CR MG/L	AS MG/L	BA MG/L	CD MG/L	PB MG/L	HG MG/L
5608 8-MAR-83	POND SOLID SAMP. A	2.5	<.04	<.5	.74	<.5	<.002
5608 8-MAR-83	POND SOLID SAMP. B	2.4	<.04	<.5	<.05	<.5	<.002

IMPLEMENTATION PROCEDURES

TO COMPLY WITH

RCRA INTERIM STATUS STANDARDS

FOR

GROUNDWATER IMPACT ASSESSMENT AND MONITORING

Prepared By:

Terry L. Bentley

Sr. Staff Environmental Engineer

Kerr-McGee Corporation

April 1, 1981

SUMMARY

Owners and operators of hazardous waste (HW),[1] surface impoundments, landfills, and landfarms are required by RCRA[2] to implement one of three alternate groundwater monitoring programs no later than November 19, 1981 (45 FR 33239). These alternate programs are:

1. Demonstrate a low potential for migration of HW to water supply wells or surface water; or

2. Implement a groundwater monitoring program to determine impact on groundwater quality; or

3. Implement an expanded groundwater monitoring program if it is assumed or known that HW has significantly affected groundwater quality.

Dr. W. J. Ganus' Hydrology Department will inspect each Kerr-McGee site to determine the proper location of monitoring wells, help coordinate well drilling, and supervise well installation. Your groundwater monitoring programs should then be implemented in accordance with Figure 1. A description of each item of Figure 1 and designation of responsibilities is provided in the text which follows.

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[1] Hazardous waste as defined in 40 CFR Part 261.

[2] Resource Conservation and Recovery Act, PL 94-580 dated October 21, 1976.

IMPLEMENTATION PROCEDURES

FOR COMPLIANCE WITH

RCRA GROUNDWATER IMPACT ASSESSMENT AND MONITORING PROGRAMS

Figure 1 is a schematic flow sheet for guidance in establishing and conducting groundwater impact assessment and monitoring programs required by RCRA.

Item 1: Submit Part A RCRA Permit Application.

These applications were submitted to EPA prior to November 19, 1980, for existing operating facilities.

Responsibility: Submitted by Operating Facility.
Approved by Environmental Affairs.

Item 2: Perform First Site Visit.

A reconnaissance visit by Hydrology and Environmental Affairs people will be made to learn of past and present practices, compile hydrologic and geologic data and make a preliminary judgement whether groundwater degradation has occurred.

Responsibility: Hydrology and Environmental Affairs.

Item 3: Prepare Preliminary Site Evaluation Report.

Existing information will be summarized and recommendations made for obtaining any additional data which may be required.

Responsibility: Hydrology and Environmental Affairs.

Item 4: Perform Site Soil/Water Testing (If Existing Data Insufficient).

Soil borings, permeability tests, groundwater quality tests, etc., may be required to further establish a data base.

Responsibility: Operating Facility. Drilling by outside contractor supervised by Hydrology. Concurrence by Environmental Affairs.

Item 5: Prepare Final Site Evaluation Report and Recommendations.

Preliminary report (Item 3) will be revised to include results of Item 4. One of three groundwater programs will be recommended. A waiver demonstration is preferable, but may not always be possible.

Responsibility: Hydrology, Environmental Affairs, and Operating Facility.

Item 6: Select a Course of Action.

A groundwater program will be selected.

Responsibility: Hydrology. Concurrence by Environmental Affairs and Operating Facility.

Item 7: Prepare Waiver Demonstration Report.

All or part of the monitoring requirements may be waived if low potential for migration of HW to water supply wells or surface water can be demonstrated. A written report, certified by a qualified geologist or geotechnical engineer, must be prepared by November 19, 1981 and kept at the facility.

Responsibility: Hydrology. Concurrence by Environmental Affairs and Operating Facility.

Item 8: Design Groundwater Monitoring System.

A minimum of four groundwater monitoring wells are required. At least one must be upgradient (in the direction of increasing static head) and at least three downgradient (in the direction of decreasing static head).

Separate monitoring systems for each surface impoundment, landfill, or landfarm are not required as long as HW migration can be detected.

The well casing must be screened or perforated and packed with gravel or sand to allow sample collection at proper depths. The casing must also be sealed with cement grout or bentonite clay to prevent contamination of sampling zone.

Responsibility: Hydrology. Concurrence by Environmental Affairs and Operating Facility.

Item 9: Install Monitoring Wells.

Wells installed per Item 8. Dr. W. J. Ganus of the Hydrology Department is scheduling installation. A target date of September 1, 1981, has been set for installing all wells. Comp about 26 Oct 81

Responsibility: Operating Facility. Installation by outside contractor supervised by Hydrology. Concurrence by Environmental Affairs.

Item 10: Review Annually.

Groundwater surface elevations must be reviewed annually to insure that the wells are located properly. If not, the number, location, or depth of wells must be modified.

Responsibility: Hydrology and Environmental Affairs.

Item 11: Prepare Groundwater Sampling and Analysis Plan.

A written plan must be prepared by November 19, 1981, and kept at the facility. This plan must include procedures and techniques for:

1. Sample Collection;
2. Sample Preservation and Shipment;
3. Analytical Procedures; and
4. Chain of Custody Control.

The plan must require:

1. Monitoring wells to be sampled and analyzed quarterly for the parameters in Table I for the first year to establish a baseline. After the first year, groundwater quality parameters must be analyzed annually, indicator parameters semi-annually, and analysis of drinking water parameters can be discontinued. See Appendix I for instructions concerning sampling and analysis techniques.

2. Four replicate measurements of each of the indicator parameters to be obtained for upgradient wells the first year. After the

first year, four replicate measurements of each of the indicator parameters must be obtained for all wells.

3. Groundwater surface elevations to be determined each time a sample is obtained.

4. Sample analysis to be continued during the active life of HW facilities and during the post-closure care period of HW disposal facilitities (normally 30 years).

Responsibility: Operating Facility and Environmental Affairs.

TABLE I

REQUIRED ANALYSES

GROUNDWATER MONITORING WELLS

Drinking Water Parameters:

Arsenic	Methoxychlor
Barium	Toxaphene
Cadmium	2,4-D
Chromium	2,4,5-TPSilvex
Fluoride	Radium
Lead	Gross Alpha
Mercury	Gross Beta
Nitrate (as N)	Turbidity
Selenium	Coliform Bacteria
Silver	
Endrin	
Lindane	

Groundwater Quality Parameters:

Chloride	Phenols
Iron	Sodium
Manganese	Sulfate

Contamination Indicator Parameters:

pH
Specific Conductance
Total Organic Carbon
Total Organic Halogen[1]

[1]There is no standard accepted procedure for the determination of Total Organic Halogen. Environmental Affairs has requested clarification from EPA and will advise.

Item 12: Prepare Outline of Groundwater Quality Assessment Plan.

An outline of a more comprehensive groundwater program than the one implemented the first year (Refer to Item 8) must be prepared by November 19, 1981, and kept at the facility: The program must be capable of determining:

1. Whether HW or HW constituents have entered the groundwater.

2. Rate and extent of migration of HW or constituents.

3. Concentration of HW or constituents in the groundwater.

Responsibility: Hydrology and Environmental Affairs.

Item 13: Implement Sampling and Analysis Program.

Implement program described in Item 11.

Responsibility: Operating Facility. Approved by Environmental Affairs.

Item 14: Establish Initial Background Values During First Year.

Quarterly analyses performed the first year must be recorded and summarized to establish a baseline.

Responsibility: Hydrology and Environmental Affairs.

Item 15: Report Results to EPA.

Results obtained the first year must be sent to Environmental Affairs and Hydrology immediately after they are available to allow time for review prior to submitting to EPA. Results of the drinking water analyses for each well must be submitted to the EPA Regional Administrator within 15 days after receipt, or to the State if it has obtained RCRA interim authorization. Concentrations or values which exceed the Interim Primary Drinking Water standards must be identified.

Reporting of groundwater quality parameters is not

required. Indicator parameters must be reported in the Annual Report (Refer to Item 17).

Responsibility: Reported by Operating Facility after approval by Environmental Affairs.

Item 16: Continue Sampling and Analysis During Active Life of the Facility.

Continue the program identified in Item 11.

Responsibility: Operating Facility. Approved by Environmental Affairs.

Item 17: Submit Results in Annual Report to EPA.

An Annual Report must be submitted to the EPA Regional Administrator, or to the State, if it has obtained RCRA interim authorization, by March 1 of each year. This report must include:

1. Concentrations or values of indicator parameters for each well.

2. Statistical evaluations of indicator parameters (Refer to Item 18).

3. Results of the evaluation of groundwater surface elevations performed in Item10 and modifications required to the monitoring system.

Responsibility: Submitted by Operating Facility. Approved by Environmental Affairs.

Item 18: Perform Statistical Analyses on Indicator Parameters.

First year indicator parameter measurements must be pooled for each upgradient well and the initial background arithmetic mean and variance of each parameter calculated. After the first year, the arithmetic mean and variance of each indicator parameter must be calculated semi-annually for each upgradient and downgradient well using the four replicate measurements taken on each sample.

Responsibility: Hydrology and Environmental Affairs.

Item 19: Compare Semi-Annual Indicator Results to Initial Background Values.

Each semi-annual arithmetic mean calculated for a specific parameter must be compared with its background arithmetic mean using the student's t-test (statistical test) at the 0.01 level of significance to establish whether a "statistically significant" change has occurred. The calculation for the student's t-test is as follows:

$$t = \frac{\bar{x} - \bar{y}}{s} \sqrt{\frac{nm}{n + m}}$$

where, $\bar{x}$ = average of four replicate measurements obtained during semiannual testing.

$\bar{y}$ = average of sixteen (four replicate measurements per quarter) measurements establishing initial background.

s = overall standard deviation for all measurements under examination.

m = 4

n = 16

therefore, $t = \frac{\bar{x} - \bar{y}}{s}$ (1.79)

A "t" value exceeding 2.84 represents a "statistically significant" change.

Responsibility: Hydrology and Environmental Affairs.

Item 20: Has Degradation Occurred? (Upgradient Wells)

Student's t-test results must be evaluated for upgradient wells. Groundwater sampling and analysis must continue.

Responsibility: Hydrology and Environmental Affairs.

Item 21: Submit Results in Annual Report to EPA.

Significant increases (or pH decreases) in upgradient wells must be submitted in the Annual Report due March 1 of each year. Groundwater sampling and analysis must continue.

Responsibility: Submitted by Operating Facility. Concurrence by Environmental Affairs and Hydrology.

Item 22: Has Degradation Occurred? (Downgradient Wells)

Student's t-test results must be evaluated for downgradient wells. If degradation has not occurred, the original sampling and analysis program must be continued.

Responsibility: Hydrology and Environmental Affairs.

Item 23: Prepare Assessment Plan from Outline (See Item 12).

If comparisons for the downgradient wells show significant increases (or pH decreases), a specific plan for a groundwater quality assessment program must be prepared. It must be certified by a qualified geologist or geotechnical engineer and specify.

1. The number, location, and depths of wells.

2. Sampling and analytical methods for those HW constituents in the facility.

3. Evaluation procedures, including any use of previously gathered information.

4. An implementation schedule.

Responsibility: Hydrology. Concurrence by Environmental Affairs.

Item 24: Obtain Additional Samples and Analyze.

Additional samples must be obtained immediately from downgradient wells where significant increases (or pH decreases) were detected. Samples must be split in two and four replicate measurements of each split sample taken for indicator(s) showing significant differences.

Responsibility: Operating Facility. Approved by Environmental Affairs.

Item 25: Were Results Due to Lab Error?

Measurements must be compared to background data to determine if results were due to laboratory error. If they were, the original sampling and analysis program must be continued.

Responsibility: Environmental Affairs and Operating Facility.

Item 26: Notify EPA.

The EPA Regional Administrator, or the State if it has obtained RCRA interim authorization, must be notified in writing within seven days if degradation has occurred.

Responsibility: Notification by Operating Facility. Approved by Environmental Affairs.

Item 27: Submit Assessment Plan to EPA.

The assessment plan must be submitted within 15 days after the notification of Item 26.

Responsibility: Submitted by Operating Facility. Approved by Environmental Affairs.

Item 28: Implement Assessment Plan.

The assessment plan must be implemented as soon as technically feasible and determine:

1. Rate and extent of HW migration in the groundwater.

2. Concentrations of HW constituents in the groundwater.

Responsibility: Operating Facility, Hydrology, and Environmental Affairs.

Item 29: Submit Assessment Report to EPA.

A written report assessing the groundwater quality must be submitted within 15 days after the first determination of Item 28. It must be submitted to the EPA Regional Administrator, or State if it has obtained RCRA interim authorization.

Responsibility: Submitted by Operating Facility. Prepared by Hydrology. Approved by Environmental Affairs.

Item 30: Has Degradation Occurred?

If the first determination shows that HW has not entered the groundwater, the original sampling and analysis program must be continued. If HW has entered the groundwater, proceed to Item 31.

Responsibility: Hydrology and Environmental Affairs.

Item 31: Determine Closure Status.

Was the assessment made before or after final closure of the facility?

Responsibility: Operating Facility and Environmental Affairs.

Item 32: Make Quarterly Assessments Until Final Closure.

Determinations of Item 28 must be continued quarterly until final closure. Results must be submitted in the Annual Report due March 1 of each year.

Responsibility: Submitted by Operating Facility. Prepared by Hydrology. Approved by Environmental Affairs.

Item 33: Cease Determination.

Assessments may be discontinued if the assessment plan was implemented during the post-closure care period.

Responsibility: Operating Facility and Environmental Affairs.

Item 34: Design Expanded Groundwater Monitoring System.

An expanded groundwater monitoring program may be implemented if it is assumed or known that groundwater quality has been significantly affected.

Responsibility: Hydrology. Concurrence by Environmental Affairs and Operating Facility.

Item 35: Install Monitoring Wells.

Wells installed per Item 34. Dr. W. J. Ganus of the Hydrology Department is scheduling installation. A target date of September 1, 1981 has been set for installing all wells.

Responsibility: Operating Facility. Installation by outside contractor supervised by Hydrology. Concurrence by Environmental Affairs.

Item 36: Submit Groundwater Quality Assessment Plan to EPA.

A specific plan for a groundwater quality assessment program must be submitted by November 19, 1981 to the EPA Regional Administrator, or to the State if it has obtained RCRA interim authorization. The plan must specify:

1. The number, location, and depth of wells.
2. Sampling and analytical methods for those HW constituents in the facility.
3. Evaluation procedures, including any use of previously gathered information.
4. An implementation schedule.

The first groundwater samples must be analyzed prior to November 19, 1981. Implementation must be in accordance with Items 28-33 with the exception of Item 30, which does not apply.

Responsibility: Submitted by Operating Facility. Prepared by Hydrology and Environmental Affairs.

Prepared By: Teryl L. Bentley
T. L. Bentley

Concurred By: W. J. Ganus
W. J. Ganus

Approved By: _____
T. L. Hurst

Dated: _____

APPENDIX I

SAMPLING AND ANALYSES TECHNIQUES

GROUNDWATER MONITORING PROGRAMS

APPENDIX I

SAMPLING AND ANALYSES TECHNIQUES GROUNDWATER MONITORING PROGRAMS

The following standard sampling and preservation techniques must be employed when monitor wells are sampled and analyzed.

Preparation for Sampling

1. Measure depth to water from the top of the well casing within 1/10 of an inch.

2. Clear standing water from the casing as specified below:

   (a) Pumping: A pump should be used for sampling whenever possible. Three casing-volumes of water should be pumped from the well before sampling. For wells that have a slow recovery rate, the well should be evacuated and allowed to recover at least once prior to sampling.

   (b) Bailing: When pumping is not possible (i.e. a 2" casing) the well casing must be bailed to dryness at least once then allowed to recover before sampling. If this is not possible due to a rapid recovery rate, one casing-volume should be bailed from the well before sampling.

Sampling Volumes, Containers, and Preservation Requirements

The attached Table I lists EPA recommended sample volumes, preservatives, containers, and holding times. For example, the following samples, preservatives, and containers would be required for RCRA groundwater monitoring.

Container	Preservative	Parameter
Plastic/Glass (polyethylene w/ polypropylene top recommended) 1 gallon	Filter on site using a 0.45 υ membrane filter and pressure apparatus. Add HNO_3 to pH <2	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, Fe, Mn, Na, Ra Gross α, Gross β.
Glass only 1 quart	Add H_3PO_4 to pH <4, 1.0 g $CuSO_4$/1. Cool to 4°C.	Phenols

Container	Preservative	Parameter
Glass only 1 quart	Cool to 4°C.	Pesticides--must be extracted 7 days after sampling (Proposed in the 12/18/78 FR)
Plastic/Glass 1 gallon	Cool to 4°C.	F, Cl, SO_4, NO_3(N) turbidity, coliform bacteria, specific conductance*
Plastic/Glass 1 quart	Cool to 4°C. H_2SO_4 or HCl to pH <2.	TOC*, TOX

ph* must be determined on site.

*For establishing baseline data, four replicate determinations must be obtained for each sample of the upgradient well for these parameters.

All glass containers should be cleaned thoroughly and rinsed with distilled water before sampling. Preferably new sterile plastic containers should be used when possible. Each container should be rinsed at least once with the sample before filling one sample container.

The RCRA regulations require total organic halogen analysis for which there is no standard procedure. Environmental Affairs is awaiting clarification from EPA on this requirement.

Analyses

All analyses must be conducted by using procedures found in "Standard Methods for the Examination of Water and Wastewater", 14th edition; "Methods for Chemical Analysis of Water and Wastes" (EPA 600/4-79-020, March, 1979); or the Annual Book of ASTM Standards, Part 31, "Water" (1976).

Environmental Affairs has prepared a list of certified laboratories. Except for those facilities that have complete in-house capability and routinely perform NPDES or equivalent analysis, it is imperative a competent State/EPA certified laboratory do the sampling and analyses at each facility.

Chain-of-Custody

Proper chain-of-custody records are essential to avoid any questions regarding sample integrity. A Kerr-McGee standard chain-of-custody form has been prepared which must accompany the sample from the time it is taken to the time it is analyzed. The complete chain-of-custody record must be kept by the K-M

site manager and a copy sent to Environmental Affairs with the analytical results.

References

1. "Methods for Chemical Analysis of Water and Wastes", (EPA 600/4-79-020) March, 1979.

2. "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", (EPA 600/4-79-019) March, 1979.

3. "Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities", (EPA 530/SW-611) August, 1977.

TABLE 1

RECOMMENDATION FOR SAMPLING AND PRESERVATION OF SAMPLES ACCORDING TO MEASUREMENT[1]

Measurement	Vol. Req. (ml)	Container[2]	Preservative	Holding Time[3]
100 Physical Properties				
Color	50	P,G	Cool, 4°C	24 Hrs.
Conductance	100	P,G	Cool, 4°C	24 Hrs.[4]
Hardness	100	P,G	Cool, 4°C HNO_3 to pH < 2	6 Mos.[5]
Odor	200	G only	Cool, 4°C	24 Hrs.
pH	25	P,G	Det. on site	6 Hrs.
Residue				
Filterable	100	P,G	Cool, 4°C	7 Days
Non-Filterable	100	P,G	Cool, 4°C	7 Days
Total	100	P,G	Cool, 4°C	7 Days
Volatile	100	P,G	Cool, 4°C	7 Days
Settleable Matter	1000	P,G	None Req.	24 Hrs.
Temperature	1000	P,G	Det. on site	No Holding
Turbidity	100	P,G	Cool, 4°C	7 Days
200 Metals				
Dissolved	200	P,G	Filter on site HNO_3 to pH < 2	6 Mos.[5]
Suspended	200		Filter on site	6 Mos.
Total	100	P,G	HNO_3 to pH < 2	6 Mos.[5]

TABLE 1 (CONT)

Measurement	Vol. Req. (ml)	Container[2]	Preservative	Holding Time[3]
Mercury				
Dissolved	100	P,G	Filter on site HNO_3 to pH < 2	38 Days (Glass) 13 Days (Hard Plastic)
Total	100	P,G	HNO_3 to pH < 2	38 Days (Glass) 13 Days (Hard Plastic)
300 Inorganics, Non-Metallics				
Acidity	100	P,G	None Req	24 Hrs.
Alkalinity	100	P,G	Cool, 4°C	24 Hrs.
Bromide	100	P,G	Cool, 4°C	24 Hrs.
Chloride	50	P,G	None Req.	7 Days
Chlorine	200	P,G	Det. on site	No Holding
Cyanides	500	P,G	Cool, 4°C NaOH to pH 12	24 Hrs.
Fluoride	300	P,G	None Req.	7 Days
Iodide	100	P,G	Cool, 4°C	24 Hrs.
Nitrogen				
Ammonia	400	P,G	Cool,4°C H_2SO_4 to pH < 2	24 Hrs.
Kjeldahl, Total	500	P,G	Cool, 4°C H_2SO_4 to pH < 2	24 Hrs.[6]
Nitrate plus Nitrite	100	P,G	Cool, 4°C H_2SO_4 to pH < 2	24 Hrs.[6]
Nitrate	100	P,G	Cool, 4°C	24 Hrs.
Nitrite	50	P,G	Cool, 4°C	48 Hrs.

TABLE 1 (CONT)

Measurement	Vol. Req. (ml)	Container[2]	Preservative	Holding Time[3]
Dissolved Oxygen				
Probe	300	G only	Det. on site	No Holding
Winkler	300	G only	Fix on site	4–8 Hours
Phosphorus				
Ortho-phosphate, Dissolved	50	P,G	Filter on site Cool, 4°C	24 Hrs.
Hydrolyzable	50	P,G	Cool, 4°C H_2SO_4 to pH < 2	24 Hrs.[6]
Total	50	P,G	Cool, 4°C H_2SO_4 to pH < 2	24 Hrs.[6]
Total, Dissolved	50	P,G	Filter on site Cool, 4°C H_2SO_4 to pH < 2	24 Hrs.[6]
Silica	50	P only	Cool, 4°C	7 Days
Sulfate	50	P,G	Cool, 4°C	7 Days
Sulfide	500	P,G	2 ml zinc acetate	24 Hrs.
Sulfite	50	P,G	Det. on site	No Holding
400 Organics				
BOD	1000	P,G	Cool, 4°C	24 Hrs.
COD	50	P,G	H_2SO_4 to pH < 2	7 Days[6]
Oil & Grease	1000	G only	Cool, 4°C H_2SO_4 or HCl to pH < 2	24 Hrs.
Organic carbon	25	P,G	Cool, 4°C H_2SO_4 or HCl to pH < 2	24 Hrs.
Phenolics	500	G only	Cool, 4°C H_3PO_4 to pH < 4 1.0 g $CuSO_4$/l	24 Hrs.
MBAS	250	P,G	Cool, 4°C	24 Hrs.

TABLE 1 (CONT)

Measurement	Vol. Req. (ml)	Container[2]	Preservative	Holding Time[3]
NTA	50	P,G	Cool, 4°C	24 Hrs.

1. More specific instructions for preservation and sampling are found with each procedure as detailed in this manual. A general discussion on sampling water and industrial wastewater may be found in ASTM, Part 31, p. 72–82 (1976) Method D-3370.

2. Plastic (P) or Glass (G). For metals, polyethylene with a polypropylene cap (no liner) is preferred.

3. It should be pointed out that holding times listed above are recommended for properly preserved samples based on currently available data. It is recognized that for some sample types, extension of these times may be possible while for other types, these times may be too long. Where shipping regulations prevent the use of the proper preservation technique or the holding time is exceeded, such as the case of a 24-hour composite, the final reported data for these samples should indicate the specific variance.

4. If the sample is stabilized by cooling, it should be warmed to 25°C for reading, or temperature correction made and results reported at 25°C.

5. Where HNO_3 cannot be used because of shipping restrictions, the sample may be initially preserved by icing and immediately shipped to the laboratory. Upon receipt in the laboratory, the sample must be acidified to a pH <2 with HNO_3 (normally 3 ml 1:1 HNO_3/liter is sufficient). At the time of analysis, the sample container should be thoroughly rinsed with 1:1 HNO_3 and the washings added to the sample (volume correction may be required).

6. Data obtained from National Enforcement Investigations Center-Denver, Colorado, support a four-week holding time for this parameter in Sewerage Systems. (SIC 4952).

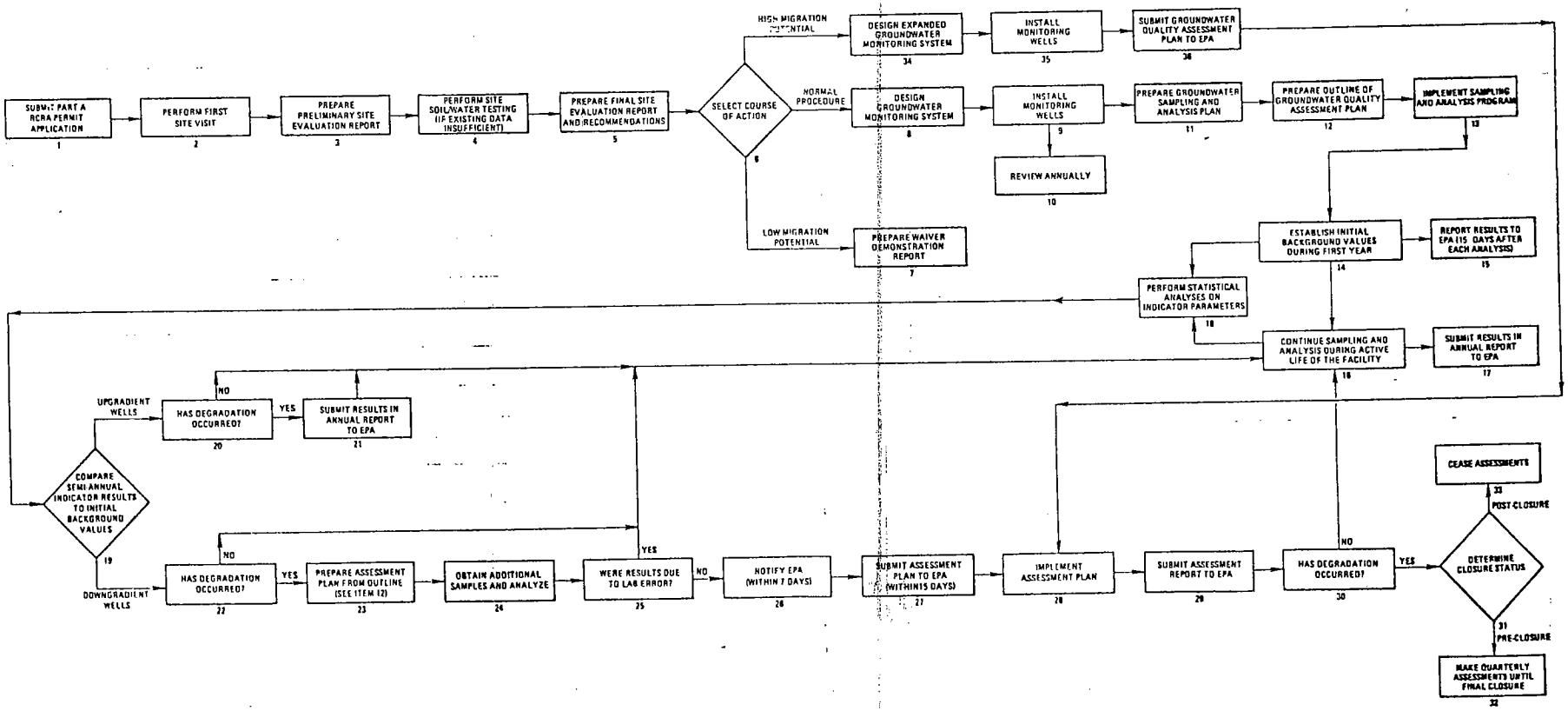


FIGURE 1

IMPLEMENTATION SCHEMATIC
RCRA INTERIM STATUS STANDARDS
FOR
GROUNDWATER IMPACT ASSESSMENT AND MONITORING

KERR-McGEE CORPORATION
ENVIRONMENTAL AFFAIRS DEPARTMENT

GROUNDWATER ASSESSMENT OUTLINE

The objective of the following summary is to provide the operator of this facility with guidance should groundwater analysis prescribed by 40 CFR 265.92 - 93 indicate groundwater contamination is occurring or has occurred. This summary is based on the attached corporate outline prepared by T. Bentley November 18, 1981.

After the first year, groundwater monitoring sampling will continue on a semiannual basis for groundwater quality or groundwater contamination parameters, as is appropriate. Each well sampled shall have the indicator parameters, pH, specific conductance, total organic carbon, and total organic halogen, analyzed in quadruplicate and the mean and variance compared with the initial background mean and variance. If there is a statistically significant increase (or decrease in case of pH), the operator shall do the following:

1. Resample and analyze to determine if variation was the result of laboratory error.

2. Should resampling confirm difference

   a. On upgradient wells report the findings in the annual report to the administrator.

   b. On downgradient wells report the results within seven days of receipt of complete laboratory report to administrator that facility may be affecting groundwater.

3. Within 15 days of initial notification, develop and submit to administrator a groundwater assessment program. The details to be included in the assessment plan are spelled out in the corporate outline attached to this summary.

It is understood that suggestions and recommendations of the administrator may change the initial plan outline and implementation schedule but every effort will be made to fulfill the regulatory requirements in a timely manner.

ENVIRONMENTAL PROTECTION AGENCY

REGION IX

SURVEILLANCE & ANALYSIS DIVISION

NPDES Compliance Monitoring Report

Permittee: Kerr-McGee Chemical Corporation
Oklahoma City, Oklahoma

Facility: Kerr-McGee Chemical Corporation
Henderson NV

Permit No.: NV0000078

Date of Inspection: June 19, 1980

Inspection Participants:

EPA: Kenneth D. Greenberg
Environmental Engineer

Facility: Charles B. Armstrong
Plant Manager

Richard F. Wohletz
Superintendent, Plant Technical Services

Report Prepared by: Kenneth D. Greenberg

FINDINGS

Introduction

The Kerr-McGee Chemical Corporation operates an inorganic chemical production plant at the Basic Management, Inc. (BMI) industrial complex in Henderson, Nevada. The Kerr-McGee facility is subject to NPDES Permit No. NV0000078 which became effective on February 24, 1977 and expires on September 30, 1981. Under the permit, Kerr-McGee is authorized to discharge a daily maximum of 4.0 mgd of non-contact cooling water during the period of June 1 through September 30. The non-contact cooling water is discharged through an open ditch to Las Vegas Wash. Other process streams are either recycled or discharged to lined evaporation ponds located at the plant site. Pond parameters are summarized in Table-1 and their locations are shown in Figure 1.

The BMI industrial complex was originally owned by the U.S. Government which produced magnesium metal at the facility. In 1945, the portion of the industrial complex which is currently owned by Kerr-McGee was taken over by the Western Electrochemical Company. Western Electrochemical merged into American Potash and Chemical Corp. which took over operations at the facility in 1955. Finally, American Potash and Chemical Corp. merged into Kerr-McGee which gained control of the plant operations in 1967. Except for expansion to the production of boron compounds in the early 70's, the list of inorganic products at the facility (see details below) is basically unchanged since 1945.

Prior to 1976, liquid waste streams and slurried solid wastes from the facility were discharged to the unlined BMI ponds located across Boulder Highway to the northeast of the production area. In the mid-70's lined ponds were constructed on the Kerr-McGee plant property to accomodate liquid waste and recycle streams. Solid wastes have been and continue to be disposed on the Kerr-McGee plant property. Solid wastes were also disposed at the BMI dump, located northwest of the facility, until the dump closed in early 1980.

Production Processes and Wastewater Streams

Production at the Kerr-McGee facility is divided into four major processes: 1) Sodium chlorate, 2) perchlorates, 3) manganese dioxide, and 4) boron chemicals.

In the first process, sodium chlorate ($NaClO_3$) is produced in an electrolytic process from raw materials of sodium chloride and water. Sodium chlorate is sold for use in paper pulp bleaches and is also used as an intermediate in the production of perchlorates at the Henderson facility. Waste from the production of sodium chlorate consists of a filter cake containing impurities from the raw materials and filter aid.

In the past, the filter cake (containing calcium sulfate, calcium carbonate, graphite, and diatomaceous earth) has been slurried to the BMI ponds or disposed at the BMI dump. The filter cake, which contains 50% moisture, is currently dumped on the ground surface in the northwest corner of the plant property (see Figure 1).

Spills, cooling tower leaks, and excess storm runoff from the sodium chlorate process are discharged to the lined ponds, P-2, and P-3. Water from these ponds is recycled back to the process.

During the summer, non-contact cooling water, used in the sodium chlorate process is discharged to Las Vegas Wash via the BMI storm ditch and the Alpha ditch. Additional details on this discharge are provided in the subsection below on plant effluent.

The second major process at Kerr-McGee involves the production of ammonium perchlorate (NH_4ClO_4) and potassium perchlorate ($KClO_4$) which are used in the manufacture of rocket fuels. In this process, a solution of sodium chlorate is first electrolytically converted to sodium perchlorate ($NaClO_4$). The sodium perchlorate is then combined with salts of either ammonia or potassium to form the respective perchlorates.

Wastes from the ammonium perchlorate process include a filter cake and chromic hydroxide which is derived from the use of chromium as a filter aid. In the past, the filter cake, containing calcium sulfate and calcium carbonate, was slurried to the BMI ponds. Now the filter cake and chromic hydroxide are discharged in slurry form to the lined ponds AP-1 or AP-2. At the time of the inspection pond AP-2 was not in use and was empty. Liquid from these ponds is recycled back to the process through the pump basin AP-3. Emergency overflows from the ammonium perchlorate cooling tower are discharged to the lined pond AP-4. A minor stream from a caustic scrubber in the ammonium perchlorate process is discharged to pond P-2 along with wastes from the sodium chlorate process (described above). A waste stream from the potassium perchlorate process containing NaCl, KCl, and $KClO_4$ is discharged to the lined pond S-1.

The third major process at Kerr-McGee is the production of manganese dioxide which is sold for use in high performance dry cells. Low grade manganese ore is crushed, roasted, and then combined with sulfuric acid. The resulting manganous sulfate is then converted to manganese dioxide (MnO_2) by electrolysis. Wastes from this process include a solid waste containing silica, alumina, iron, and heavy metals which is filtered from the roasted ore after it has been combined with sulfuric acid. This waste, which amounts to 50% by weight of the raw ore, is currently disposed in piles at the Kerr-McGee plant site (see Figure 1).

A minor waste stream of sodium phosphate solution is discharged to pond C-1. The solution, which is used for cleaning the electrolytic cell electrodes, is discharged in batches of approximately 5,000 gallons once or twice per week. All other water used in the production of manganese dioxide is recycled.

The fourth major process at Kerr-McGee is the production of elemental boron (B), boron trichloride (BCl_3), and boron tribromide (BBr_3). Boron trichloride is used in the manufacture of boron filament for aircraft structures. Boron tribromide is used in semiconductor doping. Elemental boron is used in pyrotechnics. Waste streams from the production of boron chemicals include a leachate stream containing magnesium sulfate (500 gal./day) and a wet scrubber stream (7000 gal./day). These wastes were being discharged to pond S-1 at the time of the inspection.

Pond C-1 receives a waste stream from the plant's main boiler and cooling tower blowdown. The company reported that the discharge to pond C-1 contains 22,450 ppm total dissolved solids. Liquid in pond C-1 is not recycled back to the plant.

Ponds and Pond Leakage Monitoring

The Kerr-McGee discharge permit requires that:

"1. If any waste waters... are placed in ponds, such ponds shall be located and constructed so as to:

   a. contain with no discharge the once-in-one-hundred years storm at said location;

   b. Withstand with no discharge the once-in-one-hundred years flood of said location; and

   c. prevent escape of waste water by leakage.

2. The permittee shall submit to the Director and the Regional Administrator a summary of the results obtained from monitoring for seepage and leakage at the frequency specified in Part 1.C.2."

Plant personnel conduct a program of monitoring for pond leakage which involves 1) checking the level of liquid in each pond once or twice per week and 2) analyzing the concentration of certain salts in each pond every two or three weeks. With this data, large leaks can be detected by looking for unusual changes in the level of a pond or the load of dissolved salts

in a pond. The levels of liquid in adjacent ponds is also compared as a means for detecting losses of liquid in excess of the evaporation rate. A spot check of recorded data from this monitoring program revealed no unusual drops in pond level. Kerr-McGee officials stated that the monitoring program had revealed leaks in the liners of ponds P-1 and AP-2 which have now been repaired.

However, the current leakage monitoring program is not capable of detecting small leaks. The following techniques would make leak detection more exact but would still be subject to inaccuracies due to inherent errors in measurements. A continuous level recorder at each pond would provide a more complete picture of liner integrity and make comparison of levels in different ponds easier. However, it would still be difficult to separate liquid losses due to evaporation and small leaks. Continuous level recorders would also provide estimates of the volume of inflow to ponds which currently is not measured. TIMET, one of the other companies at the BMI complex, uses a lithium tracer for detection of leaks in their lined ponds. A known quantity of lithium carbonate is placed in each pond. Periodically the lithium concentration and the pond volume is determined. From this data the load of lithium in each pond can be calculated. A drop in the amount of lithium in a given pond would be due to loss through leakage since the lithium load is not affected by evaporation. It is not necessary to measure pond inflow with the lithium tracer technique.

As noted above, Kerr-McGee has been recording data from their leakage monitoring program. However, they have not been reporting this data to the Nevada DEP or EPA as required by the permit. The plant superintendent said that he was not aware of the requirement to report this data.

Originally all of the lined ponds at the Kerr-McGee facility were lined with a single layer of polyvinyl chloride (PVC) on the bottom joined to chlorinated polyethylene (CPE) on the side walls. CPE was used on the side walls of the pond because of its greater resistence to solar radiation. Kerr-McGee officials explained that the PVC/CPE pond liners have been deteriorating over the years because the two membrane materials are incompatable when in contact with each other. In four of the Kerr-McGee ponds, the original PVC/CPE liner developed leaks and have been replaced with a liner made of nylon reinforced rubber. During the inspection the plant superintendent stated that the company planned to take pond S-1 out of service in the near future in order to replace its PVC/CPE lining. The potassium perchlorate waste stream would be rerouted to pond P-1 which has a nylon reinforced rubber

liner but was not in use at the time of the inspection. Ponds AP-1 and AP-4 still have the original PVC/CPE liners which the superintendent claimed were in satisfactory condition. In future inspections, the condition of the AP-1 and AP-4 pond linings should be checked. The new nylon reinforced hypolon liners appear to be holding without excessive deterioration.

Plant Effluent and Monitoring Requirements

During the summer months, an average of 3.2 mgd of non-contact cooling water is used in the sodium chlorate process. As authorized by the NPDES permit, this non-contact cooling water is discharged to an unlined, open ditch. The discharge flows approximately 200 ft. to the north at which point it flows into the BMI storm ditch (another unlined open ditch) and continues to the east (see Figure 1). In accordance with their permit, the Kerr-McGee discharge passes under Boulder Highway in the BMI siphon, and through the crossover pipe to the Alpha ditch and on to Las Vegas Wash (see Figure 2).

The BMI storm ditch is also used by Stauffer Chemical Company for their permitted stormwater discharges. Stauffer is located immediately west of Kerr-McGee in the BMI complex. However, under Stauffer's permit, their stormwater discharges are required to flow through the BMI siphon and down the acid ditch which discharges to the upper BMI ponds. If Stauffer discharged stormwater during the summer months it would combine with the Kerr-McGee discharge of non-contact cooling water in the BMI storm ditch. Under their discharge permit, Stauffer would be required to close the crossover pipe in order to route their stormwater discharge to the upper BMI ponds. However, closing the crossover pipe would also cause the Kerr-McGee effluent to flow to the upper BMI ponds. Kerr-McGee is not authorized to discharge to the upper BMI ponds. On the other hand, if the crossover pipe were left open, then the Kerr-McGee effluent and the Stauffer stormwater would flow into the Alpha ditch. The flow of Stauffer stormwater to the Alpha ditch is not allowed under the Stauffer discharge permit. The conflict described above can be resolved either by 1) a permit modification or, 2) a rearrangement of the discharge ditches so the Kerr-McGee and Stauffer discharges do not use a common discharge route.

Under their discharge permit Kerr-McGee is required to monitor their effluent for flow, temperature, pH and oil and grease. The company is also required to measure the change in total dissolved solids and suspended solids of the non-contact cooling water which occurs in the process. Temperature is measured and recorded on a continuous basis while composites for TDS, suspended solids, and oil and grease are collectd manually at the head of the open discharge ditch which carries the non-contact cooling water (see Figure 1). Composites are made once a week by filling 8 glass jars on an hourly

basis from discharge water grabbed in a plastic bucket. The plant superintendent explained that the composites are not flow proportioned because the effluent flow is constant. A spot check of effluent flow charts revealed that this is generally true. However, the flow does fluctuate significantly on some days. Therefore, composite samples should be flow proportioned.

An orifice meter located in the plant production area is used to measure the flow which is reported in the discharge monitoring reports . This meter is only capable of measuring the discharge of non-contact cooling water. Other Kerr-McGee discharges which may occur would not be measured by the orifice meter. Other potential discharges to the BMI storm ditch by Kerr-McGee are storm water entering the unbermed ditch, pond overflows, or process spills. Many of the floor drains in the production area have been plugged to prevent such possibilities. However, during an earlier plant visit in August 1979, water leaking from a supply line in the plant was observed to be discharging through the open ditch which joins the BMI storm ditch near pond C-1. Due to the slope of the land and the lack of berms along the open ditches, storm runoff from Kerr-McGee plant property could easily enter the ditches and flow off plant property. Under their NPDES permit, Kerr-McGee is allowed to discharge noncontact cooling water. The discharge of any other liquids is not permitted.

Kerr-McGee has installed a weir and flow meter on the BMI storm ditch at the point it passes to TIMET property (see Figure 1). This meter would be capable of measuring all Kerr-McGee discharges in the BMI storm ditch. However, this meter would also measure any flow which may be discharged in the BMI storm ditch by Stauffer Chemical Company. Furthermore, the weir is not properly installed since it is not perpendicular to the axis of flow in the ditch. It is also possible for Kerr-McGee to discharge through an open ditch which enters TIMET property at a point south of the BMI storm ditch (see Figure 1). There is no flow measuring device on this ditch. In summary, with the flow measuring devices in place at the time of the inspection, it is not possible to measure all potential discharges from the Kerr-McGee plant.

A review of the plant's discharge monitoring reports for the summer months of 1979 revealed that the discharge was within the permitted limits with the exception of some exceedances of the pH limit. In 1979, the maximum limit on pH of 8.5 was exceeded in July (8.9), August (8.8), and October (8.6). The plant water supply (used for cooling water) has an average pH of 8.0 which contributes to the high pH of the discharge. The State of Nevada Division of Environmental Protection granted Kerr-McGee permission to continue their discharge of non-contact cooling water in October 1979. Due to unusually warm weather, the company found it necessary to continue the discharge until October 25, 1979.

SELF-MONITORING DEFICIENCIES

All self-monitoring procedures were in accordance with EPA requirements, EPA recommendations, and NPDES permit specifications with the exception of the following:

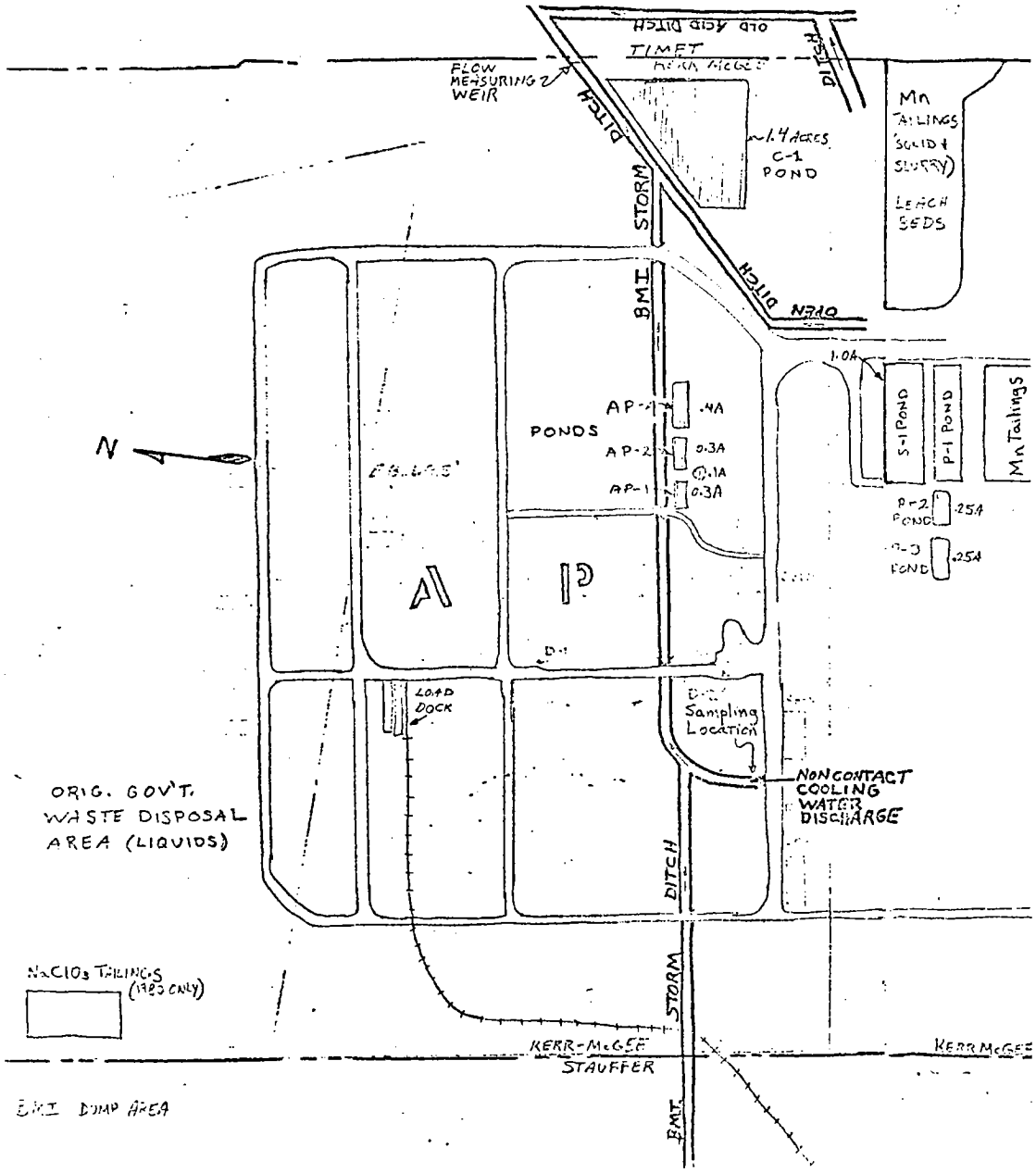
1. The permittee has failed to report the results of monitoring for leakage from holding ponds as required by the permit. (see detail in Findings Section above).

2. Composite samples of the plant effluent are not flow proportioned during collection as required by the permit. Plant personnel claim that, due to the uniform nature of the effluent, analysis results would not change significantly if the sample were flow proportioned. Kerr-McGee should show that this is true by comparing results obtained under both compositing techniques.

TABLE 1: KERR-McGEE CHEMICAL CORPORATION PONDS

POND	Process Waste	Evaporation or Recycle	Liner*	Surface Area (acres)	Capacity (gallons)
C-1	Steam Plant (Boiler), Cooling Tower	Evaporation	PVC w/reinforced rubber walls	1.4	2,750,000
P-1**	$KClO_4$ (future plans)	Evaporation	Reinforced rubber	0.7	>900,000
P-2	$NaClO_3$ spills and NH_4ClO_3 scrubber	Recycle	Reinforced rubber	0.25	350,000
P-3	$NaClO_3$ spills	Recycle	Reinforced rubber	0.25	350,000
AP-1	NH_4ClO_4	Recycle	PVC w/CPE walls	0.3	425,000
AP-2**	NH_4ClO_4	Recycle	Reinforced rubber	0.3	425,000
AP-3	Pump basin for AP-1 and AP-2	Recycle	unknown	0.1	50,000
AP-4	NH_4ClO_4 Cooling Tower	Evaporation	PVC w/CPE walls	0.4	650,000
S-1	$KClO_4$ and Boron Compounds	Evaporation	PVC w/CPE walls	1.0	2,000,000

* All ponds have single layer linings.
** Ponds which were not in use at time of inspection (June, 1980).


OLD ACID DITCH
TIMET
KERR McGEE
DITCH
FLOW MEASURING WEIR
DITCH
~1.4 ACRES C-1 POND
Mn TAILINGS (SOLID & SLURRY)
LEACH BEDS
STORM
BMI
OPEN DITCH
1.0A
S-1 POND
P-1 POND
Mn Tailings
AP-4
.4A
PONDS
AP-2
0.3A
0.1A
AP-1
0.3A
N
P-2 POND
.25A
P-3 POND
.25A
A
B
LOAD DOCK
Sampling Location
NONCONTACT COOLING WATER DISCHARGE
ORIG. GOV'T. WASTE DISPOSAL AREA (LIQUIDS)
DITCH
NaClO3 TAILINGS (1983 ONLY)
STORM
KERR-McGEE
STAUFFER
KERR McGEE
BMI
BMI DUMP AREA

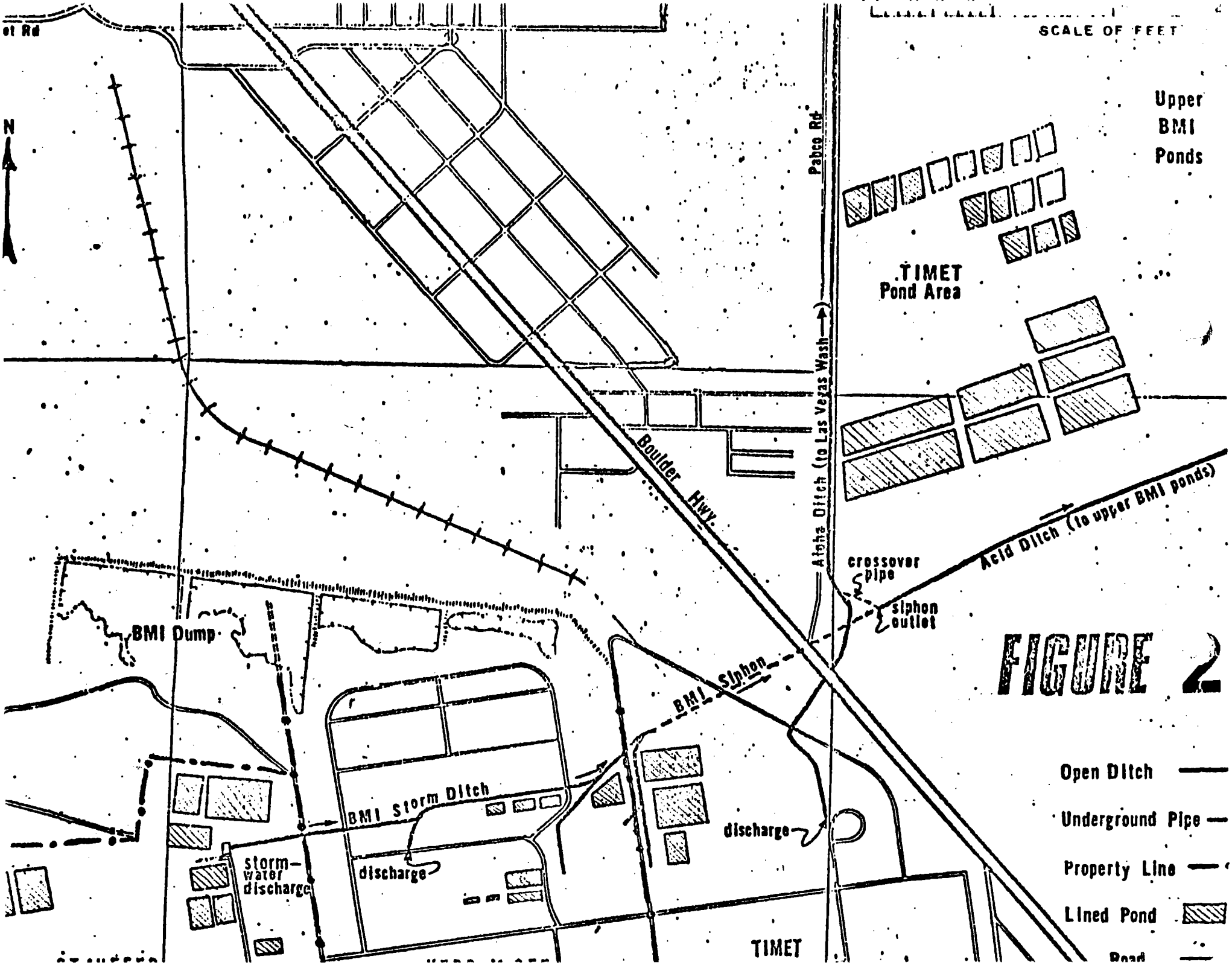

SCALE OF FEET
N
Upper
BMI
Ponds
Pabco Rd
TIMET
Pond Area
Boulder Hwy
Alpha Ditch (to Las Vegas Wash)
Acid Ditch (to upper BMI ponds)
crossover pipe
siphon outlet
BMI Dump
BMI Siphon
BMI Storm Ditch
discharge
storm-water discharge
discharge
TIMET
Open Ditch
Underground Pipe
Property Line
Lined Pond
Road

FIGURE 2

Form Approved
OMB No. 158-R70

NPDES COMPLIANCE INSPECTION REPORT (Coding Instructions on back of last page)

TRANSACTION CODE		NPDES	YR	MO	DA	TYPE	INSPECTOR	FAC TYPE	TIME
N	5	NV0000078	80	06	19	C	R	2	a.m. / p.m.
1	2	3 — 11	12		17	18	19	20	

REMARKS

21 — 65 — 70 ADDITIONAL

SECTION A - Permit Summary

NAME AND ADDRESS OF FACILITY (Include County, State and ZIP code)
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson NV 89015 (Clark County, NV)

EXPIRATION DATE: Sept. 30, 1981
ISSUANCE DATE: Feb. 24, 1977

RESPONSIBLE OFFICIAL	TITLE	PHONE
Charles B. Armstrong	Plant Manager	(702) 565-8901
FACILITY REPRESENTATIVE	**TITLE**	**PHONE**
Richard F. Wohletz	Superintendent, Plant Technical Services	(702) 565-8901

SECTION B - Effluent Characteristics (Additional sheets attached ____) Data from DMR for September 1979

PARAMETER/ OUTFALL		MINIMUM	AVERAGE Daily	MAXIMUM Daily	ADDITIONAL
Flow/ 001	SAMPLE MEASUREMENT		3.8 mgd	4.0 mgd	
	PERMIT REQUIREMENT			4.0 mgd	
Total Dissolved Solids/ 001	SAMPLE MEASUREMENT				0 mg/l net change
	PERMIT REQUIREMENT				Net change from water supply to effluent not to exceed 75 mg/l monthly avg.
Temp./ 001	SAMPLE MEASUREMENT		20°C	22°C	
	PERMIT REQUIREMENT		27°C	31°C	
Oil and Grease/ 001	SAMPLE MEASUREMENT		1.7 mg/l	2.6 mg/l	
	PERMIT REQUIREMENT		10 mg/l	15 mg/l	
pH / 001	SAMPLE MEASUREMENT	8.1		8.3	
	PERMIT REQUIREMENT	6.5		8.5	

SECTION C - Facility Evaluation (S = Satisfactory, U = Unsatisfactory, N/A = Not applicable)

S	EFFLUENT WITHIN PERMIT REQUIREMENTS	N/A	OPERATION AND MAINTENANCE	U	SAMPLING PROCEDURES
U	RECORDS AND REPORTS	N/A	COMPLIANCE SCHEDULE	S	LABORATORY PRACTICES
S	PERMIT VERIFICATION	U	FLOW MEASUREMENTS		OTHER:

SECTION D - Comments

SECTION E - Inspection/Review

SIGNATURES	AGENCY	DATE
INSPECTED BY: Kenneth D. Greenberg	EPA IX	Feb. 19, 1981
INSPECTED BY:		
REVIEWED BY:		

ENFORCEMENT DIVISION USE ONLY
COMPLIANCE STATUS
☐ COMPLIANCE
☐ NONCOMPLIANCE

EPA FORM 3560-3 (9-77) REPLACES EPA FORM 7 51 (7-73) ...

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Sections F thru L: Complete on all inspections, as appropriate. N/A = Not Applicable

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SECTION F - Facility and Permit Background

ADDRESS OF PERMITTEE IF DIFFERENT FROM FACILITY *(Including City, County and ZIP code)*
Kerr-McGee Chemical Corporation
McGee Tower
Oklahoma City, Oklahoma

DATE OF LAST PREVIOUS INVESTIGATION BY EPA/STATE
EPA - Feb. 15, 1979

FINDINGS

SECTION G - Records and Reports

RECORDS AND REPORTS MAINTAINED AS REQUIRED BY PERMIT. ☐ YES ☒ NO ☐ N/A *(Further explanation attached* X*)*
DETAILS: Leakage monitoring data not reported

(a) ADEQUATE RECORDS MAINTAINED OF:				
(i)	SAMPLING DATE, TIME, EXACT LOCATION	☒ YES	☐ NO	☐ N/A
(ii)	ANALYSES DATES, TIMES	☒ YES	☐ NO	☐ N/A
(iii)	INDIVIDUAL PERFORMING ANALYSIS	☒ YES	☐ NO	☐ N/A
(iv)	ANALYTICAL METHODS/TECHNIQUES USED	☒ YES	☐ NO	☐ N/A
(v)	ANALYTICAL RESULTS *(e.g., consistent with self-monitoring report data)*	☒ YES	☐ NO	☐ N/A
(b) MONITORING RECORDS *(e.g., flow, pH, D.O., etc.)* MAINTAINED FOR A MINIMUM OF THREE YEARS INCLUDING ALL ORIGINAL STRIP-CHART RECORDINGS *(e.g. continuous monitoring instrumentation, calibration and maintenance records).*		☒ YES	☐ NO	☐ N/A
(c) LAB EQUIPMENT CALIBRATION AND MAINTENANCE RECORDS KEPT.		☒ YES	☐ NO	☐ N/A
(d) FACILITY OPERATING RECORDS KEPT INCLUDING OPERATING LOGS FOR EACH TREATMENT UNIT.		☐ YES	☐ NO	☒ N/A
(e) QUALITY ASSURANCE RECORDS KEPT.		☒ YES	☐ NO	☐ N/A
(f) RECORDS MAINTAINED OF MAJOR CONTRIBUTING INDUSTRIES *(and their compliance status)* USING PUBLICLY OWNED TREATMENT WORKS.		☐ YES	☐ NO	☒ N/A

SECTION H - Permit Verification

INSPECTION OBSERVATIONS VERIFY THE PERMIT. ☒ YES ☐ NO ☐ N/A *(Further explanation attached _____)*
DETAILS:

(a) CORRECT NAME AND MAILING ADDRESS OF PERMITTEE.	☒ YES	☐ NO	☐ N/A
(b) FACILITY IS AS DESCRIBED IN PERMIT.	☒ YES	☐ NO	☐ N/A
(c) PRINCIPAL PRODUCT(S) AND PRODUCTION RATES CONFORM WITH THOSE SET FORTH IN PERMIT APPLICATION.	☒ YES	☐ NO	☐ N/A
(d) TREATMENT PROCESSES ARE AS DESCRIBED IN PERMIT APPLICATION.	☐ YES	☐ NO	☒ N/A
(e) NOTIFICATION GIVEN TO EPA/STATE OF NEW, DIFFERENT OR INCREASED DISCHARGES.	☐ YES	☐ NO	☒ N/A
(f) ACCURATE RECORDS OF RAW WATER VOLUME MAINTAINED.	☐ YES	☐ NO	☒ N/A
(g) NUMBER AND LOCATION OF DISCHARGE POINTS ARE AS DESCRIBED IN PERMIT.	☒ YES	☐ NO	☐ N/A
(h) CORRECT NAME AND LOCATION OF RECEIVING WATERS.	☒ YES	☐ NO	☐ N/A
(i) ALL DISCHARGES ARE PERMITTED.	☒ YES	☐ NO	☐ N/A

SECTION I - Operation and Maintenance

TREATMENT FACILITY PROPERLY OPERATED AND MAINTAINED. ☐ YES ☐ NO ☒ N/A *(Further explanation attached _____)*
DETAILS:

(a) STANDBY POWER OR OTHER EQUIVALENT PROVISIONS PROVIDED.	☐ YES	☐ NO	☒ N/A
(b) ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES AVAILABLE.	☐ YES	☐ NO	☒ N/A
(c) REPORTS ON ALTERNATE SOURCE OF POWER SENT TO EPA/STATE AS REQUIRED BY PERMIT.	☐ YES	☐ NO	☒ N/A
(d) SLUDGES AND SOLIDS ADEQUATELY DISPOSED.	☐ YES	☐ NO	☒ N/A
(e) ALL TREATMENT UNITS IN SERVICE.	☐ YES	☐ NO	☒ N/A
(f) CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATION AND MAINTENANCE PROBLEMS.	☐ YES	☐ NO	☒ N/A
(g) QUALIFIED OPERATING STAFF PROVIDED.	☐ YES	☐ NO	☒ N/A
(h) ESTABLISHED PROCEDURES AVAILABLE FOR TRAINING NEW OPERATORS.	☐ YES	☐ NO	☒ N/A
(i) FILES MAINTAINED ON SPARE PARTS INVENTORY, MAJOR EQUIPMENT SPECIFICATIONS, AND PARTS AND EQUIPMENT SUPPLIERS.	☐ YES	☐ NO	☒ N/A
(j) INSTRUCTIONS FILES KEPT FOR OPERATION AND MAINTENANCE OF EACH ITEM OF MAJOR EQUIPMENT.	☐ YES	☐ NO	☒ N/A
(k) OPERATION AND MAINTENANCE MANUAL MAINTAINED.	☐ YES	☐ NO	☒ N/A
(l) SPCC PLAN AVAILABLE.	☐ YES	☐ NO	☒ N/A
(m) REGULATORY AGENCY NOTIFIED OF BY PASSING. *(Dates _____ _____)*	☐ YES	☐ NO	☒ N/A
(n) ANY BY-PASSING SINCE LAST INSPECTION.	☐ YES	☐ NO	☒ N/A
(o) ANY HYDRAULIC AND OR ORGANIC OVERLOADS EXPERIENCED.	☐ YES	☐ NO	☒ N/A

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SECTION J - Compliance Schedules

PERMITTEE IS MEETING COMPLIANCE SCHEDULE. ☐ YES ☐ NO ☒ N/A *(Further explanation attached ____)*

CHECK APPROPRIATE PHASE(S):

- ☐ (a) THE PERMITTEE HAS OBTAINED THE NECESSARY APPROVALS FROM THE APPROPRIATE AUTHORITIES TO BEGIN CONSTRUCTION.
- ☐ (b) PROPER ARRANGEMENT HAS BEEN MADE FOR FINANCING *(mortgage commitments, grants, etc.)*.
- ☐ (c) CONTRACTS FOR ENGINEERING SERVICES HAVE BEEN EXECUTED.
- ☐ (d) DESIGN PLANS AND SPECIFICATIONS HAVE BEEN COMPLETED.
- ☐ (e) CONSTRUCTION HAS COMMENCED.
- ☐ (f) CONSTRUCTION AND/OR EQUIPMENT ACQUISITION IS ON SCHEDULE.
- ☐ (g) CONSTRUCTION HAS BEEN COMPLETED.
- ☐ (h) START-UP HAS COMMENCED.
- ☐ (i) THE PERMITTEE HAS REQUESTED AN EXTENSION OF TIME.

SECTION K - Self-Monitoring Program

Part 1 – Flow measurement *(Further explanation attached ____)*

PERMITTEE FLOW MEASUREMENT MEETS THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☒ YES	☐ NO	☐ N/A
(a) PRIMARY MEASURING DEVICE PROPERLY INSTALLED.	☒ YES	☐ NO	☐ N/A
TYPE OF DEVICE: ☐ WEIR ☐ PARSHALL FLUME ☐ MAGMETER ☐ VENTURI METER ☒ OTHER *(Specify)* Orifice			
(b) CALIBRATION FREQUENCY ADEQUATE. *(Date of last calibration ____)*	☒ YES	☐ NO	☐ N/A
(c) PRIMARY FLOW MEASURING DEVICE PROPERLY OPERATED AND MAINTAINED.	☒ YES	☐ NO	☐ N/A
(d) SECONDARY INSTRUMENTS *(totalizers, recorders, etc.)* PROPERLY OPERATED AND MAINTAINED.	☒ YES	☐ NO	☐ N/A
(e) FLOW MEASUREMENT EQUIPMENT ADEQUATE TO HANDLE EXPECTED RANGES OF FLOW RATES.	☒ YES	☐ NO	☐ N/A

Part 2 – Sampling *(Further explanation attached X)*

PERMITTEE SAMPLING MEETS THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☐ YES	☒ NO	☐ N/A
(a) LOCATIONS ADEQUATE FOR REPRESENTATIVE SAMPLES.	☒ YES	☐ NO	☐ N/A
(b) PARAMETERS AND SAMPLING FREQUENCY AGREE WITH PERMIT.	☒ YES	☐ NO	☐ N/A
(c) PERMITTEE IS USING METHOD OF SAMPLE COLLECTION REQUIRED BY PERMIT. IF NO, ☐ GRAB ☐ MANUAL COMPOSITE ☐ AUTOMATIC COMPOSITE FREQUENCY ____	☒ YES	☐ NO	☐ N/A
(d) SAMPLE COLLECTION PROCEDURES ARE ADEQUATE.	☐ YES	☒ NO	☐ N/A
(i) SAMPLES REFRIGERATED DURING COMPOSITING	☐ YES	☒ NO	☐ N/A
(ii) PROPER PRESERVATION TECHNIQUES USED	☒ YES	☐ NO	☐ N/A
(iii) FLOW PROPORTIONED SAMPLES OBTAINED WHERE REQUIRED BY PERMIT	☐ YES	☒ NO	☐ N/A
(iv) SAMPLE HOLDING TIMES PRIOR TO ANALYSES IN CONFORMANCE WITH 40 CFR 136.3	☒ YES	☐ NO	☐ N/A
(e) MONITORING AND ANALYSES BEING PERFORMED MORE FREQUENTLY THAN REQUIRED BY PERMIT.	☐ YES	☒ NO	☐ N/A
(f) IF (e) IS YES, RESULTS ARE REPORTED IN PERMITTEE'S SELF-MONITORING REPORT.	☐ YES	☐ NO	☒ N/A

Part 3 – Laboratory *(Further explanation attached ____)*

PERMITTEE LABORATORY PROCEDURES MEET THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☒ YES	☐ NO	☐ N/A
(a) EPA APPROVED ANALYTICAL TESTING PROCEDURES USED. *(40 CFR 136.3)*	☒ YES	☐ NO	☐ N/A
(b) IF ALTERNATE ANALYTICAL PROCEDURES ARE USED, PROPER APPROVAL HAS BEEN OBTAINED.	☐ YES	☐ NO	☒ N/A
(c) PARAMETERS OTHER THAN THOSE REQUIRED BY THE PERMIT ARE ANALYZED.	☐ YES	☒ NO	☐ N/A
(d) SATISFACTORY CALIBRATION AND MAINTENANCE OF INSTRUMENTS AND EQUIPMENT.	☒ YES	☐ NO	☐ N/A
(e) QUALITY CONTROL PROCEDURES USED.	☒ YES	☐ NO	☐ N/A
(f) DUPLICATE SAMPLES ARE ANALYZED. ____ ...% OF TIME.	☒ YES	☐ NO	☐ N/A
(g) SPIKED SAMPLES ARE USED. ____ ...% OF TIME.	☒ YES	☐ NO	☐ N/A
(h) COMMERCIAL LABORATORY USED.	☐ YES	☒ NO	☐ N/A
(i) COMMERCIAL LABORATORY STATE CERTIFIED.	☐ YES	☐ NO	☒ N/A

LAB NAME ____

LAB ADDRESS ____

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SECTION L - Effluent/Receiving Water Observations *(Further explanation attached _____)*

OUTFALL NO.	OIL SHEEN	GREASE	TURBIDITY	VISIBLE FOAM	VISIBLE FLOAT SOL	COLOR	OTHER
001	None	None	None	None	None	None	

(Sections M and N: Complete as appropriate for sampling inspections)

SECTION M - Sampling Inspection Procedures and Observations *(Further explanation attached _____)*

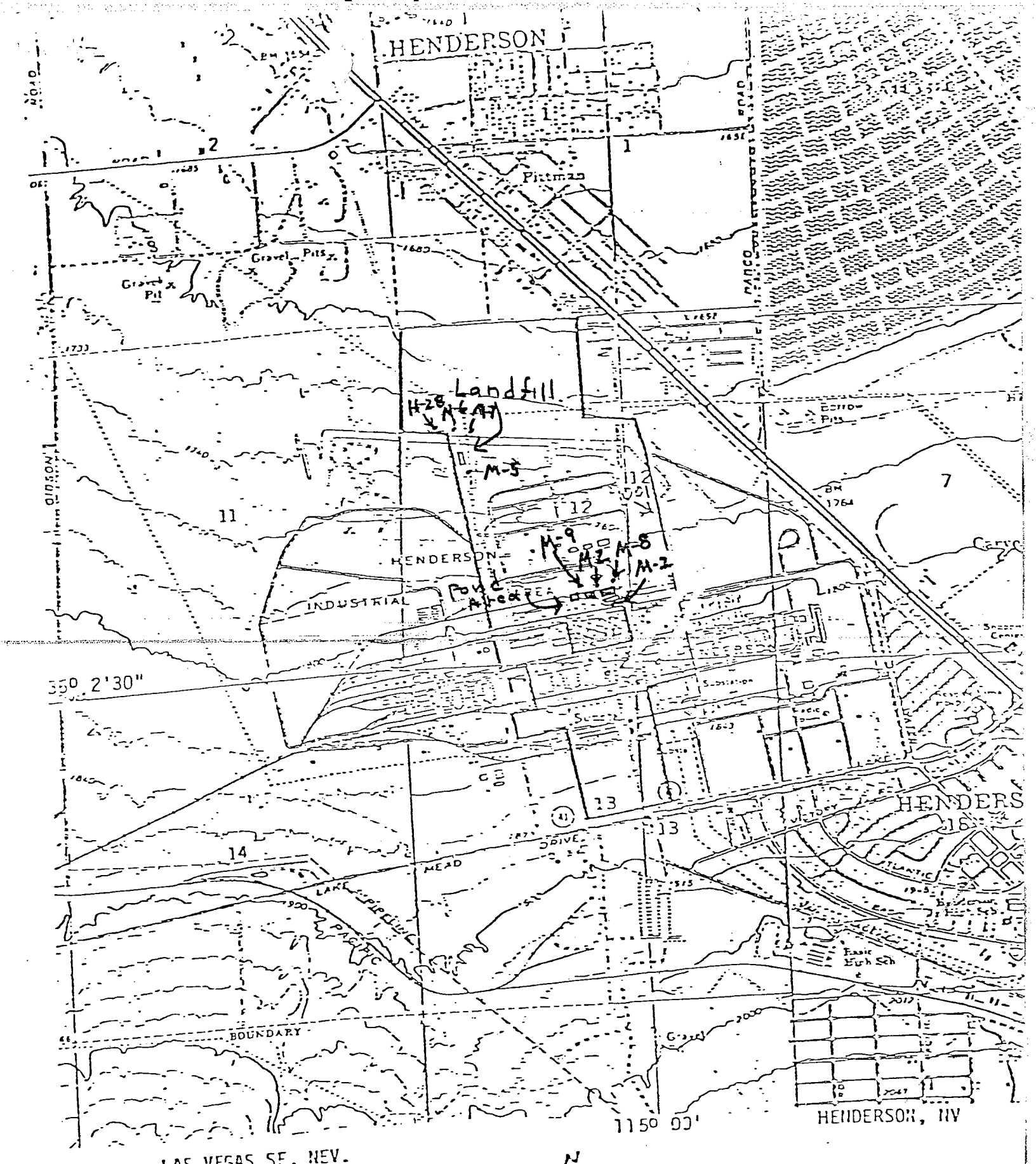
- ☐ GRAB SAMPLES OBTAINED
- ☐ COMPOSITE OBTAINED
- ☐ FLOW PROPORTIONED SAMPLE
- ☐ AUTOMATIC SAMPLER USED
- ☐ SAMPLE SPLIT WITH PERMITTEE
- ☐ CHAIN OF CUSTODY EMPLOYED
- ☐ SAMPLE OBTAINED FROM FACILITY SAMPLING DEVICE

COMPOSITING FREQUENCY _____ PRESERVATION _____

SAMPLE REFRIGERATED DURING COMPOSITING: ☐ YES ☐ NO

SAMPLE REPRESENTATIVE OF VOLUME AND NATURE OF DISCHARGE _____

SECTION N - Analytical Results *(Attach report if necessary)*



M-7, M-5 up gradient wells