



**KERR-McGEE CHEMICAL CORPORATION**

POST OFFICE BOX 55 • HENDERSON, NEVADA 89015

September 4, 1985

Certified Mail No. P 673 531 403

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SEP 06 1985

ENVIRONMENTAL  
PROTECTION

Mr. Thomas J. Fronapfel, P.E.  
Environmental Engineer  
Waste Management Section  
Division of Environmental Protection  
Nevada Department of Conservation  
and Natural Resources  
201 South Fall Street  
Carson City, NV 89710

Dear Mr. Fronapfel:

Kerr-McGee Chemical Corporation has completed activities for closure of the S-1 surface impoundments located at the Henderson facility. J. H. Kleinfelder and Associates provided a review of project activities and professional engineer's certification that the closure activities were in conformance with the "Hazardous Waste Closure/Post-Closure Plan, Revision 1" dated September 28, 1984, as approved by the Division of Environmental Protection, Nevada Department of Conservation and Natural Resources on April 16, 1985. This consultant's certification is attached along with supporting documents.

We understand that upon NDEP acceptance of Kleinfelder's certification, closure of S-1 surface impoundment is completed and no further action is required on KMCC's part. If you have any questions, please contact S. Crowley at (702) 565-8901, Ext. 234.

Your written acceptance of this certification would be appreciated.

Sincerely,

R. B. Chase, Jr.  
Plant Manager

RBC:jc  
Attachments

# J. H. KLEINFELDER & ASSOCIATES

GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

LAND & WATER RESOURCES

3189 MILL STREET • RENO, NV 89502

(702) 323-7182

Date: August 27, 1985

File: L-1359-3

Kerr-McGee Chemical Corporation  
P.O. Box 55  
Henderson, Nevada 89015

Attention: Ms. S. M. Crowley

Subject: Closure Compliance  
S-1 Surface Impoundment  
Henderson Plant  
Henderson, Nevada

Gentlemen:

This letter presents a summary of the data supplied to us by your office and our conclusions on the adequacy of the closure operation for the subject structure based on that data.

It appears the S-1 impoundment was closed in the Fall of 1982 by removing all wastes and liners. All removed materials were placed in a hazardous waste landfill located on-site. The exposed subgrade of the S-1 impoundment was drilled and sampled on March 2, 1984 and August 24, 1984. The purpose of the sampling operation was to assess whether the constituents formerly contained in the impoundment had leaked into the subsurface soils. The soil samples obtained on August 24, 1985 were relinquished by Mr. Stater, an employee of Kerr-McGee Chemical Corporation and received and signed for by the designated representative of Desert Research Institute on August 27, 1985. The soil samples obtained on March 2, 1984 appear to have been received by a representative of the Desert Research Institute for analytical analysis, however, there is no signature of the person who obtained the samples. It should also be noted that there is no indication of the specific sampling protocol used in obtaining the samples. The chain-of-custody forms are attached.

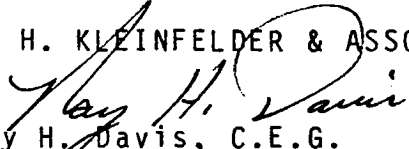
Assuming the samples were obtained from the indicated locations and depths and the analytical laboratory tested the samples using the "EP" toxicity test procedure, the data indicates the exposed soil subgrade should not be considered a hazardous waste due to chromium content as defined by 40 CFR 261.20 and 261.24. This conclusion assumes chromium was the only hazardous substance impounded by the structure.

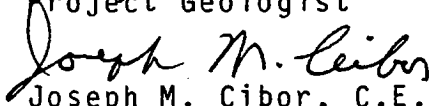


Based on the data reviewed to date, it appears the S-1 impoundment was closed in conformance to the intent of the "Hazardous Waste Closure/Post-Closure Plan, Revision 1" dated September 28, 1984 which is in our possession as of this date. A copy of the closure plan is attached.

Yours very truly,

J. H. KLEINFELDER & ASSOCIATES

  
Ray H. Davis, C.E.G.  
Project Geologist

  
Joseph M. Cibor, C.E.  
Manager - Las Vegas Office

RHD:JMC:emc

Enclosure: Chain-of-custody forms  
Closure Plan



KERR-McGEE CHEMICAL CORPORATION

HENDERSON, NEVADA FACILITY

HAZARDOUS WASTE CLOSURE/POST-CLOSURE PLAN

Revision 1 - September 28, 1984

I. Background

A revised Part A "Application for a Hazardous Waste Permit" for Kerr-McGee Chemical Corporation's (KMCC) Henderson, Nevada facility was submitted on July 14, 1982, to the U. S. Environmental Protection Agency (EPA), Region IX, with a copy to the Nevada Division of Environmental Protection (NDEP).

This application identified three hazardous wastes generated at the facility, together with the TSD Hazardous Waste Management facilities. These were reported as follows:

1. Liquid waste containing chromium from manufacturing potassium perchlorate which was stored in two lined surface impoundments, designated P-1 and S-1.
2. Filter cake mud containing chromium from the sodium chlorate production process which was disposed of in a hazardous waste landfill located onsite.
3. Waste solvents stored in one 55-gallon steel drum.

In September of 1982, KMCC permanently terminated potassium perchlorate production. As described below in the closure plans for ponds S-1 and P-1, the potassium perchlorate operation was completely cleaned and the equipment transferred to other uses. All hazardous materials, including the liner, were removed from pond S-1 and placed in the onsite hazardous waste landfill prior to January 25, 1983. Neither the landfill nor pond P-1 received hazardous waste after January 25, 1983.

At this time, KMCC desires to close the two surface impoundments and the hazardous waste landfill under interim status standards. The generator identification number will be retained to allow offsite shipment of hazardous waste to permitted disposal facilities. The closure/post-closure plans for the two surface

impoundments are described below. The closure/post-closure plan for the landfill was submitted on June 13, 1984.

As a result of its review of the KMCC Plan dated April 5, 1984, NDEP advised KMCC by letter dated August 17, 1984, of certain deficiencies in the Plan and requested KMCC to make appropriate revisions to the closure portions.

This revision to the April 5 Plan addresses the concerns identified by the NDEP and, more accurately, reflects NDEP's closure requirements. The following revisions are made:

- A. Procedures are described for cleaning up S-1, P-1, and all affected areas to a level below that specified for total chromium in 40 CFR, Part 261.24, which is 5 ppm.
- B. KMCC will not establish background levels of chromium or use statistical comparisons, such as the students' t-test, to determine cleanup of contaminated areas.
- C. Chromium in soil samples from the impoundments and affected areas will be analyzed by Desert Research Institute (DRI) in accordance with the procedures given in 40 CFR 261.
- D. Procedures are given for verifying that all affected areas were properly cleaned.
- E. A new section is added to the Plan that identifies the source of chromium contamination.

## II. Closure/Post-Closure Plan for Surface Impoundment S-1

### 1. History

Pond S-1 was constructed in October of 1974. It was excavated in the native soil and the liner was installed by Hydraulic Materials, a company which specialized in installing liners for surface impoundments. The excavation was smoothed and the bottom was sealed with 20-mil PVC. The east berm was covered with 30-mil laminated-reinforced CPE, and the other three side berms were covered with 30-mil plain CPE. The sides were covered with CPE because of its greater resistance to sunlight. Pond S-1 had an approximate surface area of 47,500 ft.<sup>2</sup> and an approximate total volume of 270,000 ft.<sup>3</sup>. Cleanup and closure of S-1, described below, were completed before January 25, 1983.

## 2. Maximum Inventory

The maximum hazardous waste inventory that could have been stored in S-1, allowing 2' freeboard, was approximately 1,700,000 gallons. The liquid waste had a total chromium concentration above 5 ppm which made it hazardous by definition. Salts, such as potassium chloride, crystallized on the bottom and sides below the water level as the solution became saturated as the result of solar evaporation. These crystals contained less than 5 ppm chromium when subjected to the "EP Toxicity" test, as shown in the attached data regarding the solid phase of pond P-1. The chromium remained mostly in the liquid phase.

## 3. Removal of Contents from S-1

Soon after potassium perchlorate production was terminated in 1982, S-1 was removed from service. Some liquid was allowed to solar evaporate, but no additional equipment was used to increase evaporation. The remaining free liquid was transferred by pumps and heavy-duty hose lines to pond P-1. The dewatered solids (containing about 10 percent moisture) and the bottom and side liners were removed with a clamshell and paddle scraper. These bulk materials were handled as hazardous wastes and transported to the hazardous waste landfill onsite. Also, the two feet of soil under the liner, as well as any contaminated soil resulting from closure, was removed and placed in the landfill.

By letter dated August 17, 1984, the NDEP notified KMCC that for closure of a surface impoundment all areas affected by S-1 and P-1 must be cleaned to a level below that specified for chromium in 40 CFR 261.24, which is 5 ppm. Kerr-McGee has complied with this criteria in cleaning up S-1 and/or cleaning P-1 to the same level.

In the fall of 1982, KMCC cleaned pond S-1 by removing residual solids together with the bottom and side liners using a clamshell and paddle scraper. All these materials were buried in the hazardous waste landfill onsite before January 25, 1983. Two feet of soil from beneath the liner were also removed and placed in the landfill prior to January 25, 1983.

After the above work was completed, KMCC verified that all hazardous waste constituents were removed from the S-1 pond area by the following sampling and analysis procedures:

- A. Six soil corings to a depth of four feet were taken from the pond site at locations shown on the S-1 sketch map, Figure 1.
- B. Three soil corings to a depth of three feet were taken from outlying areas away from the pond to identify any possible contamination.
- C. A composite sample of each coring made up of equal portions of each foot was prepared for analysis.
- D. Four additional samples were taken in August, 1984, at four locations from the cleaned bottom of pond S-1 and analyzed by the procedures given in 40 CFR 261.24 by DRI.
- E. Samples of surface and core soil previously collected in March, 1984, were preserved by DRI and reanalyzed by proper procedures of 40 CFR 261.24.

Analytical results reported by DRI on the samples are given in Table I. These show that the chromium contamination in all the samples was less than 1/100 of the cleanup level of 5 ppm.

Therefore, KMCC concludes that cleanup has been completed to a level well below the criteria established by NDEP, and there is no contamination in the bottom of pond S-1 or affected areas.

There are no plans to fill the impoundment area. After certification of proper closure, it could be used for other purposes.

#### 4. Decommissioning and Cleanup of Manufacturing Area

When production of potassium perchlorate was terminated, all in-process product was finished and delivered to inventory for commercial sale. All process piping, pumps, and vessels were drained, and the liquors transferred to pond P-1. The entire operation (pipes, vessels, etc.) was flushed with copious amounts of water to remove the hazardous waste component (chromium) as well as any residual salt solution that might remain. All rinse streams were pumped to pond P-1 for storage, evaporation, and recycle.

After decontamination, as described above, most of the equipment was put in service in other

areas of the plant. Unusable piping, tanks, etc., were sold as scrap. Complete cleaning was easily determined because any liquid residue crystallized on the equipment when the water evaporated. This was avoided by thorough flushing followed by inspection of the equipment after drying.

5. Decontamination of Cleanup Equipment

The clamshell, trucks, paddle scraper, transfer pipes, etc., used in the solids removal and clean-up operation were thoroughly flushed with fresh water. The rinsate was delivered to pond P-1.

6. Decontamination of Surrounding Area

Soil around pond S-1 that was contaminated during the cleanup was removed and placed in the hazardous waste landfill. This was monitored by visual and physical inspection. There is no runoff from S-1 since the tops of the berms are about one foot above ground level. In addition, there are no stormwater ditches or drainage systems which run into S-1 that could be contaminated. As discussed in No. 3, all hazardous waste constituents were removed from the pond site.

7. Pollutant Migration

Any migration of the applicable hazardous waste constituent chromium into the underlying soil would have been detected by the soil sampling and analyses described in No. 3. Also groundwater monitoring, described below, would indicate pollutant migration.

8. Groundwater Monitoring

Closure/post-closure groundwater monitoring is not required for pond S-1 since all hazardous waste constituents have been removed. However, groundwater monitoring in the Henderson plant area is a separate program being conducted under Nevada State Groundwater Regulations. Monitoring in this program includes groundwater in the area of S-1. Data from this program demonstrate that no hazardous waste constituent (i.e., chromium) was traceable to S-1.

9. Closure/Cover Materials

As mentioned in No. 3 above, the pond S-1 site will not be filled, pending a decision to use



the area for other purposes. Cover is not required since all hazardous waste constituents have been removed.

10. Closure/Post-Closure Costs

Kerr-McGee has already expended funds in the amount of approximately \$30,000 to close pond S-1. Final certification by a Professional Engineer for the two surface impoundments and landfill will cost \$1,500.

11. Closure Schedule

As stated above, surface impoundment S-1 was closed prior to January 25, 1983. Sampling and analyses were conducted after the solids and liner had been removed. After approval of closure plans for pond P-1 and the landfill, all work will be completed within 180 days, and the work will be monitored by responsible K-M officials and a Registered PE. The NDEP will be properly notified and provided with a certified copy of the PE inspection report.

III. Closure/Post-Closure Plan for Surface Impoundment P-1

1. History

Pond P-1 was constructed in April of 1972 and relined in 1980. The new liner was installed by B. F. Goodrich and consisted of 30-mil Hypalon. Pond P-1 has an approximate surface area of 26,000 ft.<sup>2</sup> and approximate volume of 125,000 ft.<sup>3</sup>. Pond P-1 has not received any hazardous waste since January 25, 1983.

2. Maximum Inventory

The maximum hazardous waste inventory that could have been stored in P-1, allowing 2' freeboard, is approximately 700,000 gallons. The liquid waste had a total chromium concentration above 5 ppm which made it hazardous by definition. Salts, such as potassium chloride, have crystallized on the bottom and sides below the water level as the solution became saturated as the result of solar evaporation. These crystals contain less than 5 ppm chromium when subjected to the "EP Toxicity" test, as shown in the attached data.

3. Removal of Contents from P-1

As described in the S-1 closure plan, pond P-1 received some hazardous waste from the closure

of S-1 and the decommissioning of the potassium perchlorate manufacturing process. Pond P-1 has not received any hazardous waste since January 25, 1983.

As stated above, the liquid phase of the potassium perchlorate waste contained chromium in excess of 5 ppm. All liquid has been solar evaporated or recycled back to the process to take advantage of chromium's corrosion inhibition characteristics. The pump and line used for recycle were flushed with fresh water and the rinsate placed in pond P-1 and allowed to solar evaporate. No other equipment was used to aid or promote evaporation.

To confirm the remaining solids in pond P-1 were nonhazardous, the solids were sampled and analyzed by Desert Research Institute as specified below:

- A. Solid samples were taken from the bottom of the pond at locations shown on the attached map to a depth of one foot.
- B. These solids were subjected to the EP Toxicity Extractions and analyzed for the "EP Toxic" metals.

The attached analyses indicate the remaining Solids in pond P-1 are not hazardous. KMCC proposes to remove these solids and liner and place in the onsite nonhazardous waste landfill. After this has been completed, KMCC proposes to demonstrate that no hazardous constituents have migrated from the P-1 pond area as described below in Section 7, "Pollutant Migration."

4. Decommissioning of Manufacturing Area

Pond P-1 received wastes from the potassium perchlorate operation as did pond S-1. The decommissioning of the potassium perchlorate production area is described in detail in Section II.4., which is part of the pond S-1 closure plan.

5. Decontamination of Surrounding Area

Since the solids remaining in pond P-1 are not hazardous, special care in decontaminating the cleanup equipment will not be necessary.

6. Decontamination of Surrounding Area

Any surrounding soil affected by the removal of the nonhazardous solids in P-1 will be removed

and placed in the nonhazardous waste landfill. This will be monitored by visual and physical inspection. Again, it should be noted that the waste remaining in P-1 is not hazardous.

#### 7. Pollutant Migration

Any pollutant migration of chromium, the applicable hazardous waste constituent from pond P-1, during its operational life, will be determined by the following sampling and analysis procedures:

- A. After the remaining nonhazardous solids and liner are removed, six soil corings to a depth of four feet will be taken from the pond site area at locations shown in attached sketch P-1, Figure 2.
- B. A composite sample of each foot of core will be made and analyzed for chromium by DRI following procedures in 40 CFR 261.24.
- C. Surface samples to a depth of three to four inches will be taken near each core location and separately analyzed for chromium by the same procedures.
- D. Evidence of chromium concentration of 5 ppm or above will constitute reason to remove soil from the area to a depth where the chromium concentration is less than 5 ppm. All excavated soil will be transported to Beatty, Nevada for disposal at the U. S. Ecology's landfill.
- E. Surface samples and core samples to a depth of four feet will be collected from adjacent potentially affected areas and analyzed for chromium migration if chromium is detected below one foot depth in the P-1 bottom. Based on the experience with pond S-1, KMCC does not anticipate any migration of chromium from P-1.

Currently, there are no plans to fill the pond area. After certification of proper closure, it potentially could be relined and used for a nonhazardous waste impoundment.

#### 8. Groundwater Monitoring

Closure/post-closure groundwater monitoring will not be required for pond P-1 since all hazardous waste constituents will be removed. However,

groundwater monitoring in the Henderson plant area is a separate program being conducted under Nevada State Groundwater Regulations. Monitoring in this program includes groundwater in the area of P-1. Data from this program demonstrate that no hazardous waste constituent (i.e., chromium) was traceable to P-1.

9. Closure/Cover Materials

As mentioned in No. 7 above, the pond P-1 site will not be filled, pending a decision to use the area for other purposes. Cover is not required since all hazardous waste constituents have been removed.

10. Closure/Post-Closure Costs

Kerr-McGee has already expended funds in the amount of approximately \$5,000 to recycle liquid from pond P-1 and conduct sampling and analyses. Future closure costs are estimated below:

Removal/Disposal of Solids	-	\$10,000
Sampling and Analyses	-	2,000
Administrative	-	2,500
PE Certification	-	<u>500*</u>
Total		\$20,000

\*Based on one-third total certification - \$1,500

11. Closure Schedule

After approval of the closure plan, the schedule below will be followed:

Removal/Disposal of Solids	-	within 60 days
Sampling and Analyses	-	within 90 days
PE Certification	-	within 120 days

Closure will be monitored by responsible K-M officials and a Registered Professional Engineer. The NDEP will be properly notified and provided with a certified copy of the PE inspection report.

IV. Sources of Chromium Contamination

1. Impact of Surface Impoundments S-1 and P-1

Sampling and analysis of surface soil and corings beneath S-1 and in potentially affected areas showed no chromium migration had occurred. Cleanup of the areas of concern was completed to chromium concentration less than 1/100 of the 5 ppm upper

limit as specified in 40 CFR 261.24. This was done with minimum removal of soil from the bottom berm and adjacent areas.

The operational life of pond P-1 was essentially the same as S-1. There is no evidence of chromium contamination from P-1 unless analyses of soil from the bottom and affected areas indicate that chromium migration occurred.

## 2. Impact of Process Sources

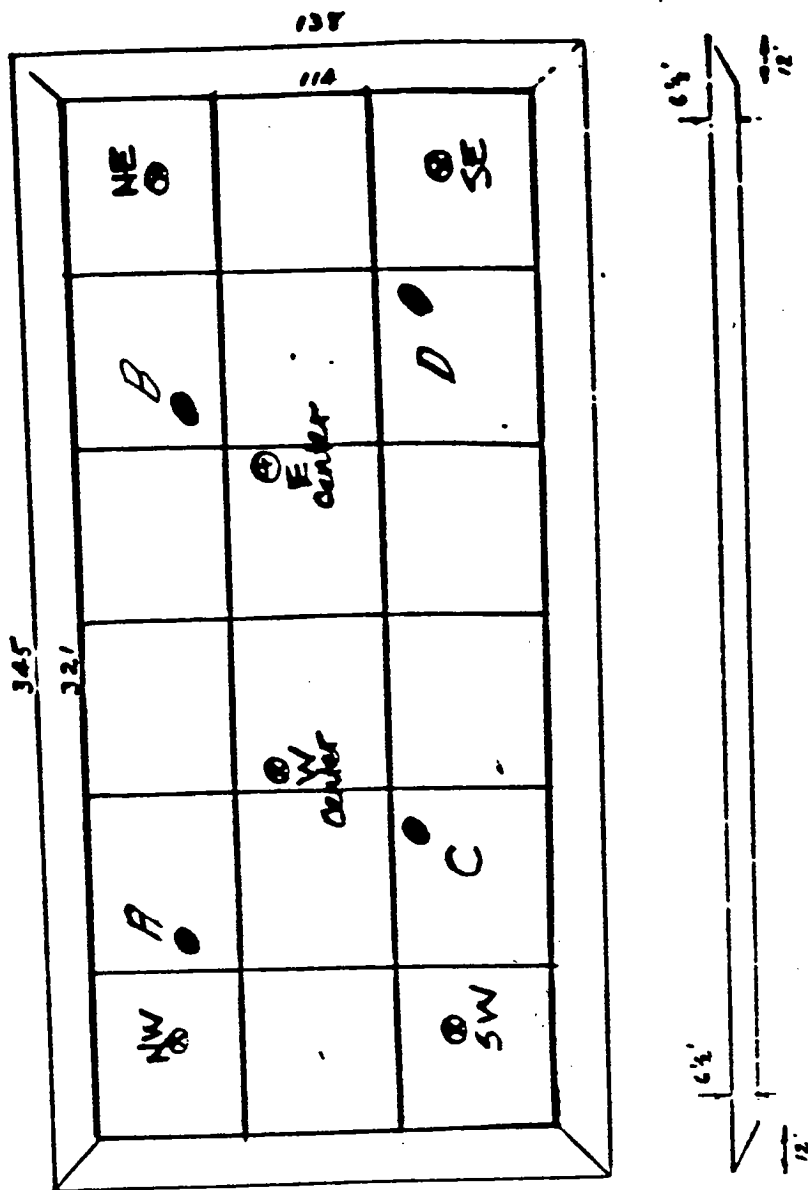
KMCC has constructed 26 wells to monitor groundwater beneath its facility for chromium. The highest chromium levels were found in M-11 and M-12 that are just north and downgradient from the sodium chlorate process buildings, Units 4 and 5.

These buildings were constructed as part of the original World War II government installation. For many years, liquids from the electrolytic cells in these buildings were collected in the old concrete basements and pumped back through the process for reuse in the cells. These liquids contained sodium dichromate as a corrosion inhibitor and buffer. The concrete basements slowly deteriorated, allowing seepage and subsequent chromium contamination of the groundwater.

KMCC has done several things to prevent this seepage and reduce the groundwater contamination as follows:

- A. Installed two wells, M-11 and M-12, on the north side of Units 4 and 5, to pump contaminated water back to the process and recapture the chromium values.
- B. Reduced seepage by minimizing the accumulation of liquid in the basements by regular pumping back to the process.
- C. Sealing the floor and walls of the basements with a special plastic coating to further reduce seepage.
- D. Committing to Clark County Health Department to replace all these cells (over 1,300 units) with new ones by August 1, 1988. The new cells will be of the most modern design and will eliminate leaks, spills, and other escape of cell liquors.

Evidence, therefore, is preponderant that the process units were the source of chromium contamination and the surface impoundments were not.



Analyses Attached

EVAPORATION POND S-1

Pond S-1

Figure 1

444 "7  
SEP 24 1984

WATER ANALYSIS LABORATORY  
DESERT RESEARCH INSTITUTE

REPORT DATE: 20-SEP-84  
FILE NAME: 7714KM.TBL

\*\*\*\*\*

LAB #	SAMPLE	CR
DATE	POINT	MG/L
7714	:EP-TOX S1	*
2-14-84	:NW CORNER	* 0.05
7715	:EP-TOX S2	*
2-14-84	:SW CORNER	* 0.02
7716	:EP-TOX S3	*
2-14-84	:W CENTER	* 0.02
7717	:EP-TOX S4	*
2-14-84	:E CENTER	* 0.11
7718	:EP-TOX S5	*
2-14-84	:NE CORNER	* 0.02
7719	:EP-TOX S6	*
2-14-84	:SE CORNER	* 0.02
7720	:EP-TOX M1	*
2-14-84	:BEACHGROUND	* 0.02
7721	:EP-TOX M2	*
2-14-84	:BEACHGROUND	* 0.02
7722	:EP-TOX M4	*
2-14-84	:BEACHGROUND	* 0.02

\*\*\*\*\*

Table I



SLP 17 1984

WATER ANALYSIS LABORATORY  
DESERT RESEARCH INSTITUTE

REPORT DATE: 13-SEP-84  
FILE NAME: 8701KM.TBL

\*\*\*\*\*

LAB # : SAMPLE \* CR  
DATE : POINT \* EPTOX

\*\*\*\*\*

LAB #	SAMPLE	CR	DATE	POINT	EPTOX
:	:	*	:	:	*
8701	A-1	*	24-AUG-84	:	.03
:	:	*	:	:	*
8702	A-2	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8703	A-3	*	24-AUG-84	:	.02
:	:	*	:	:	*
8704	A-4	*	24-AUG-84	:	.02
:	:	*	:	:	*
8705	A-5	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8706	A-6	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8707	E-1	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8708	E-2	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8709	E-3	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8710	B-4	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8711	F-5	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8712	B-6	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8713	C-1	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8714	C-2	*	24-AUG-84	:	<.02
:	:	*	:	:	*
8715	C-3	*	24-AUG-84	:	<.02

RESULTS ON EP-TOX EXTRACTS REPORTED IN NG/L.

WATER ANALYSIS LABORATORY  
DESERT RESEARCH INSTITUTE

REPORT DATE: 13-SEP-84  
FILE NAME: B701KM.TBL

\*\*\*\*\*

LAB #	SAMPLE	CR
DATE	POINT	EPTOX
8716	D-4	*
24-AUG-84		* (.02
8717	D-5	*
24-AUG-84		* (.02
8718	D-6	*
24-AUG-84		* (.02
8719	D-1	*
24-AUG-84		* .02
8720	D-2	*
24-AUG-84		* (.02
8721	D-2	*
24-AUG-84		* (.02
8722	D-4	*
24-AUG-84		* (.02
8723	D-5	*
24-AUG-84		* (.02
8724	D-E	*
24-AUG-84		* (.02

RESULTS ON EP-TOX EXTRACTS REPORTED IN MEAL.

WATER ANALYSIS LABORATORY  
 DESERT RESEARCH INSTITUTE

REPORT DATE: 21-MAR-84  
 FILE NAME: 7724KG.TEL

\*\*\*\*\*  
 LAB # : SAMPLE \* AG AS BA CD CR HS  
 DATE : POINT \* MG/L MG/L MG/L MG/L MG/L MG/L  
 \*\*\*\*\*

LAB #	DATE	POINT	AG	AS	BA	CD	CR	HS
			MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
7724	18-OCT-83	P-1, EP-EX SAMPLE-1	<0.1	<0.1	<0.5	<0.1	1.3	<.002
7725	18-OCT-83	P-1, EP-EX SAMPLE-2	<0.1	<0.1	<0.5	<0.1	<.2	<.002
7726	18-OCT-83	P-1, EP-EX SAMPLE-3	<0.1	<0.1	<0.5	<0.1	<.2	<.002
7727	18-OCT-83	P-1, EP-EX SAMPLE-4	<0.1	<0.1	<0.5	<0.1	0.8	<.002
7728	18-OCT-83	P-1, EP-EX SAMPLE-5	<0.1	<0.1	<0.5	0.1	0.7	<.002
7729	18-OCT-83	P-1, EP-EX SAMPLE-6	<0.1	<0.1	<0.5	<0.1	1.1	<.002

POND P-1 ANALYSIS

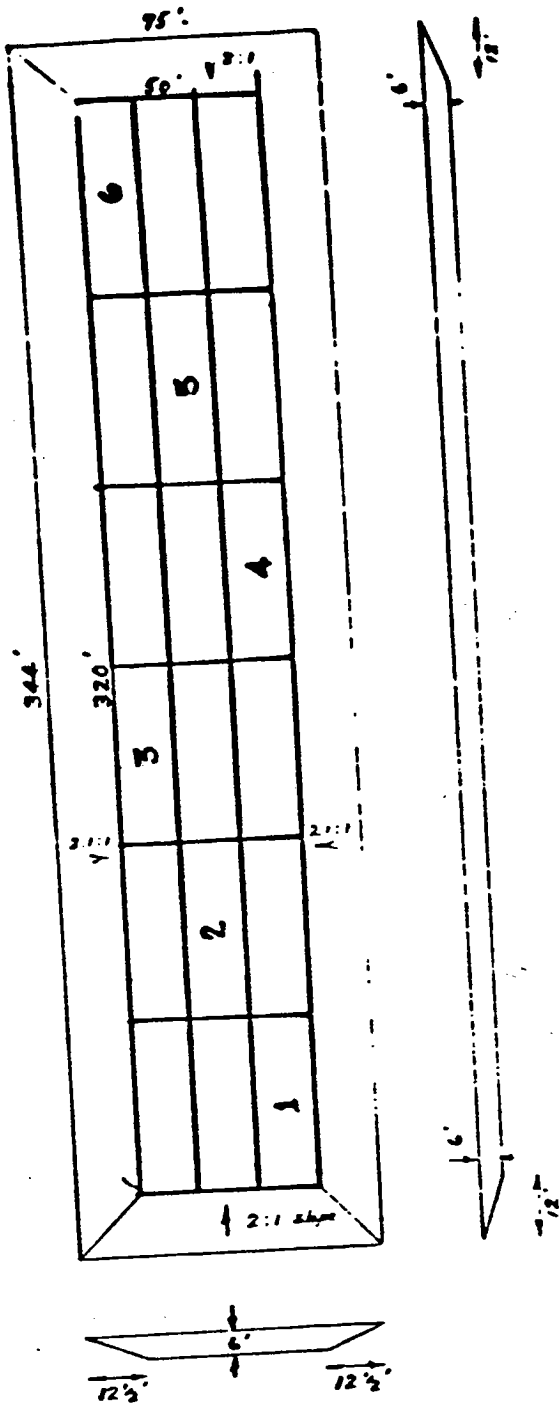
WATER ANALYSIS LABORATORY  
DESERT RESEARCH INSTITUTE

REPORT DATE: 21-MAR-84  
FILE NAME: 7724KG.TBL

\*\*\*\*\*  
LAB # \* PB SE  
\* MG/L MG/L  
\*\*\*\*\*

	*		
	*		
7724	*	<0.5	<0.1
	*		
	*		
7725	*	<0.5	<0.1
	*		
	*		
7726	*	<0.5	<0.1
	*		
	*		
7727	*	<0.5	<0.1
	*		
	*		
7728	*	<0.5	<0.1
	*		
	*		
7729	*	<0.5	<0.1

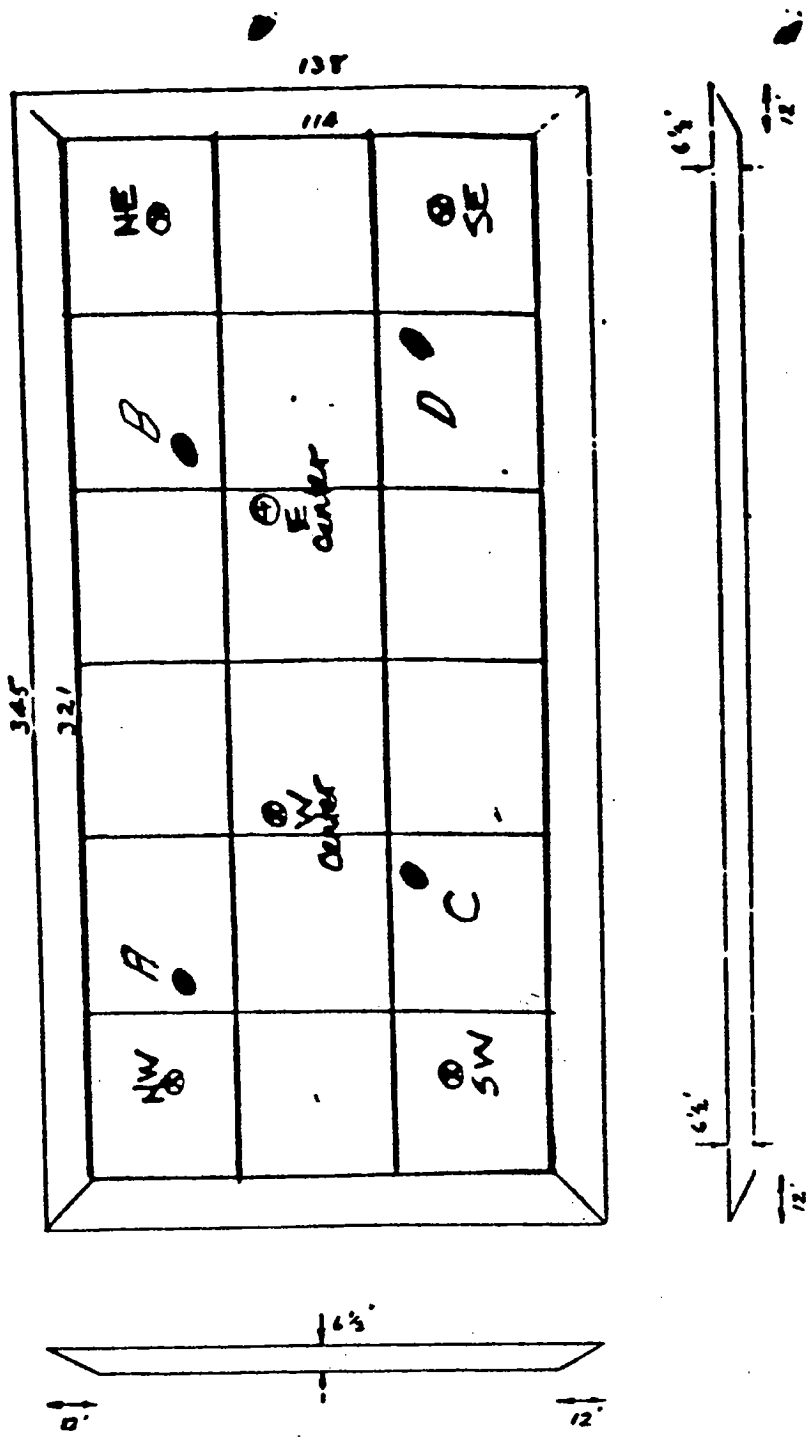
Pond P-1



Analyses Attached

POND P-1

Figure 2



EVAPORATION POND S-1

Pond S-1

Figure 1



CHAIN OF CUSTODY RECORD - ENVIRONMENTAL SAMPLES KM-3779

NAME: KMCC Henderson FACILITY: Henderson, NV. 89015

ADDRESS: Box 55

NAME: Desert Research Institute SAMPLING FIRM

ADDRESS: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

Effluent     Groundwater  
 Solid         Surface Water  
 \_\_\_\_\_     soils

NO.	LOCATION	DATE	TIME	WEATHER		SAMPLE TYPE AND METHOD			TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
				TEMP.	PREC.	COMP.	GRAB	MECH				
1	S-1 NW Corner	3/2/84		70	None						Nitric Acid	1 composite sam of each locati
2	S-1 SW Corner										Extraction	comprsd of grab sam, 1
3	S-1 W Center										leachate	part for 4
4	S-1 E Center										analyzed for Chromium	
5	S-1 NE Corner											
6	S-1 SE Corner											
M-1	background											
M-2	background											
M-4	background											
T	tails											EP Toxicity 38t. 3 grab

ADDITIONAL REMARKS: \_\_\_\_\_

RECEIVED BY (SIGNATURE): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED BY (SIGNATURE): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED BY (SIGNATURE): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

DISPATCHED BY (SIGNATURE): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

CARRIER: Desert Research Inst. WRC

LABORATORY: \_\_\_\_\_ DATE: March 29 9:56

ADDRESS: 7510 DRAPER DR. LAS VEGAS, NV. 89122

METHOD OF SHIPMENT: REC. 111 80512

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES

Yes     No. explain above

**CHAIN OF CUSTODY RECORD - ENVIRONMENTAL SAMPLES KM-4776**

NAME <i>Kerr McGee Chem-Corp</i>		FACILITY <i>P.O. Box 55</i>		SAMPLING FIRM NAME <i>Sone &amp; D.R.I.</i>	
ADDRESS <i>Headquarters W 89015</i>		ADDRESS <i>Rue W</i>		SIGNATURE <i>[Signature]</i>	
WEATHER		SAMPLE TYPE AND METHOD		ANALYSIS REQUIRED	
TEMP.	PREC.	GRAB	MECH	MAN.	NO. OF CONTAINERS

NO.	LOCATION	DATE	TIME	WEATHER TEMP.	PREC.	GRAB	MECH	MAN.	TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
B-6	NE Corner 5-1, 6"	8-24-84	1130	95	-	✓	✓	-	11	1 Bag	Chromium	Analysis by Luth FP
C-1	SW Corner 5-1, 1"	8-24-84	1135	95	-	-	-	-	11	1 Bag		Topic and
C-2	SW Corner 5-1, 2"	8-24-84	1137	-	-	-	-	-	11	1 Bag		Nitrite Acid
C-3	SW Corner 5-1, 3"	8-24-84	1140	-	-	-	-	-	11	1 Bag		Extractor for Chromium.
C-4	SW Corner 5-1, 4"	8-24-84	1145	-	-	-	-	-	11	1 Bag		
C-5	SW Corner 5-1, 5"	8-24-84	1147	-	-	✓	✓	-	11	1 Bag		
C-6	SW Corner 5-1, 6"	8-24-84	1150	-	-	✓	✓	-	11	1 Bag		
D-1	SE Corner 5-1, 1"	8-24-84	1155	-	-	✓	✓	-	11	1 Bag		
D-2	SE Corner 5-1, 2"	8-24-84	1158	-	-	✓	✓	-	11	1 Bag		
D-3	SE Corner 5-1, 3"	8-24-84	1200	-	-	✓	✓	-	11	1 Bag		
D-4	SE Corner 5-1, 4"	8-24-84	1205	-	-	✓	✓	-	11	1 Bag		

RELINQUISHED BY (SIGNATURE) <i>[Signature]</i>	RECEIVED BY (SIGNATURE) <i>[Signature]</i>	DATE 8-24-84	TIME	ADDITIONAL REMARKS
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
DISPATCHED BY (SIGNATURE)	RECEIVED FOR LABORATORY (SIGNATURE) <i>[Signature]</i>	DATE 8-24-84	TIME 12:30	
CARRIER	LABORATORY			
ADDRESS	ADDRESS <i>P.R.F. WATER LAB RENO NV</i>			
METHOD OF SHIPMENT				

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES  
 Yes  No, explain above.



**CHAIN OF CUSTODY RECORD — ENVIRONMENTAL SAMPLES KM-4775**

<b>FACILITY</b>	<b>SAMPLING FIRM</b>		<b>SAMPLE</b>
<b>NAME</b>	<i>Kerr McGee</i>		<input type="checkbox"/> Effluent <input type="checkbox"/> Groundwater
<b>ADDRESS</b>	<i>P.O. Box 55</i>		<input checked="" type="checkbox"/> Solid <input type="checkbox"/> Surface Water
<b>SIGNATURE</b>	<i>[Signature]</i>		<input type="checkbox"/> Soil Sample

NO.	LOCATION	DATE	TIME	WEATHER		SAMPLE TYPE AND METHOD				TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
				TEMP.	PREC.	COMP.	GRAB	MECH	MAN.				
D-5	SE Corner S-1	8-24-84	12:05	95	-	-	✓	✓	✓	NA	1 Bag	Chromium by EPTOX	
D-6	SE Corner S-1	8-24-84	12:10	95	-	-	✓	✓	✓	NA	1 Bag	and Nitric Acid Extraction	

<b>RELINQUISHED BY (SIGNATURE)</b>	<b>RECEIVED BY (SIGNATURE)</b>	<b>DATE</b>	<b>TIME</b>	<b>ADDITIONAL REMARKS</b>
<i>[Signature]</i>		8-24-84		
<b>REINQUISHED BY (SIGNATURE)</b>	<b>RECEIVED BY (SIGNATURE)</b>	<b>DATE</b>	<b>TIME</b>	
<b>RELINQUISHED BY (SIGNATURE)</b>	<b>RECEIVED BY (SIGNATURE)</b>	<b>DATE</b>	<b>TIME</b>	
<b>DISPATCHED BY (SIGNATURE)</b>	<b>RECEIVED FOR LABORATORY (SIGNATURE)</b>	<b>DATE</b>	<b>TIME</b>	
	<i>[Signature]</i>	27 AUG 1984	12:30	
<b>CARRIER</b>	<b>LABORATORY ADDRESS</b>			
	DAT WATER LABS			
<b>ADDRESS</b>	<b>RECEIVED BY (SIGNATURE)</b>			
	RFCO WL			
<b>METHOD OF SHIPMENT</b>				

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES

Yes     No, explain above.

**CHAIN OF CUSTODY RECORD - ENVIRONMENTAL SAMPLES KM-4775**

FACILITY		SAMPLING FIRM		SAMPLE	
NAME	NAME	EFFLUENT	GROUNDWATER	EFFLUENT	GROUNDWATER
ADDRESS	ADDRESS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SIGNATURE	SIGNATURE	SOLID	SURFACE WATER	SOLID	SURFACE WATER
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NO.	LOCATION	DATE	TIME	WEATHER		SAMPLE TYPE AND METHOD			TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
				TEMP.	PREC.	COMP.	GRAB	MECH				
A-1	1' Depth NW Corner Pond 5-1, 8-24-84	8-24-84	11:00	95	-	-	-	-	NA	1 BAG Chromium	Analyze by both EP, Tot. and Nitric Acid for Chromium.	
A-2	NW Corner 5-1, 2' depth 8-24-84	8-24-84		95	-	-	-	-	"			
A-3	NW Corner 5-1, 3' depth 8-24-84	8-24-84		"	-	-	-	-	"			
A-4	NW Corner 5-1, 4' depth 8-24-84	8-24-84		"	-	-	-	-	"			
A-5	NW Corner 5-1, 5' depth 8-24-84	8-24-84		"	-	-	-	-	"			
A-6	NW Corner 5-1, 6' depth 8-24-84	8-24-84	11:15	"	-	-	-	-	"			
B-1	NE Corner 5-1, 1' 8-29-84	8-29-84	11:15	"	-	-	-	-	"			
B-2	NE Corner 5-1, 2' 8-29-84	8-29-84	11:17	"	-	-	-	-	"			
B-3	NE Corner 5-1, 3' 8-29-84	8-29-84	11:20	"	-	-	-	-	"			
B-4	NE Corner 5-1, 4' 8-29-84	8-29-84	11:25	"	-	-	-	-	"			
B-5	NE Corner 5-1, 5' 8-29-84	8-29-84	11:30	"	-	-	-	-	"			

RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	ADDITIONAL REMARKS
<i>[Signature]</i>	<i>[Signature]</i>	8-29-84		
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	
DISPATCHED BY (SIGNATURE)	RECEIVED FOR LABORATORY (SIGNATURE)	DATE	TIME	
	<i>[Signature]</i>	8-27-84	12:30	
CARRIER	LABORATORY			
ADDRESS	LABORATORY ADDRESS			
METHOD OF SHIPMENT	ADDRESS			
	DRI WATER LAB BERO NV			

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES

Yes  No, explain above.