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

October 26, 1984

Mr. H. LaVerne Rosse, P.E.
Program Director
Waste Management Section
State of Nevada
Division of Environmental Protection
Capitol Complex
201 South Fall Street
Carson City, NV 89710

Re: Kerr-McGee Chemical Corporation
Henderson, Nevada
EPA ID No. NVD 008290330
Landfill Closure/Post-Closure Plan

Dear Mr. Rosse:

This is in response to the October 9, 1984, letter from Mr. Thomas Fronapfel, Nevada Division of Environmental Protection, listing deficiencies in the Kerr-McGee Chemical Corporation Henderson Facility landfill closure plan submitted to NDEP August 13, 1984.

This revision supersedes all previous closure/post-closure plans for this landfill. Changes were made to the following sections of the August 13, 1984, submittal. The deficiencies, as stated in Mr. Fronapfel's letter, that each section addresses, are shown in parenthesis:

Groundwater Monitoring Plan (Items 1 and 2)

Changes were made in items II.G and IV.2.a of the Plan which specify the wells to be sampled, frequency of sampling, and parameters analyzed for during the closure and post-closure periods, respectively.

Post-Closure Groundwater Monitoring
Program Maintenance (Item 3)

Revisions were made to items IV.2.c and IV.3.a to include specific instructions for monthly inspection of well caps for tampering and wells for signs of silting. Wells will be repaired or replaced, if required, to maintain monitoring system.

Closure Certification Process (Item 4)

Item V was revised to specify four separate inspections which must be conducted by the professional engineer as part of the closure certification process.

As indicated in our submittal of September 26, 1984, revised analysis of samples of the native soil from beneath pond S-1, used for the upper fill in the landfill, has resulted in chromium values well below the 5 ppm value set as a characteristic of hazardous waste by EPA and NDEP. Therefore, Appendix III has been updated to reflect the new data.

As previously stated in earlier closure/post-closure plans, use of this landfill was discontinued before January 25, 1983, and the landfill has not received any hazardous waste since that date.*

KMCC is prepared to begin closure of this landfill within seven days after notification of your approval of the closure/post-closure plan. KMCC wishes to keep its generator status and maintain less than 90-day storage for hazardous waste, which will be disposed of offsite.

Please contact Rick Stater or me at (702) 565-8901 if you have any questions or comments.

Sincerely,

KERR-McGEE CHEMICAL CORPORATION

R. B. Chase, Jr.
Facility Manager

RBC:jc
Attachment

KERR-McGEE CHEMICAL CORPORATION

HENDERSON, NEVADA FACILITY

CLOSURE/POST-CLOSURE PLAN

FOR

HAZARDOUS-WASTE LANDFILL

Revised June 13, 1984

Revised October 25, 1984

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CLOSURE/POST-CLOSURE PLAN

FOR HAZARDOUS-WASTE LANDFILL

I. BACKGROUND

The Kerr-McGee Chemical Corporation (KMCC) Facility at Henderson, Nevada is located on Lake Mead Drive, off Water Street, P. O. Box 55, Henderson, Nevada 89015.

The property comprises approximately 415 acres in the Basic Management, Inc. (BMI) industrial complex. It adjoins other industries in the complex and is bounded by public highways approximately 1/4 to 1/2 mile away on the north and south. A location map is attached in Appendix I. The closest residence is approximately 5/8 mile northeast of the landfill.

The plant has been in operation since 1945 and manufactures several electrochemical products, including manganese dioxide, sodium chlorate, and ammonium perchlorate. The facility was acquired by Kerr-McGee Chemical Corporation in 1967 by its acquisition of American Potash & Chemical Corporation, and has since been operated by KMCC.

The plant has certain environmental permits, including the following, all of which are in good standing:

- Twenty-four air emission source permits issued by Clark County, Nevada, APCD.
- Water discharge (NPDES) permit #NV0000078 for once-through noncontact cooling water. No discharge of process-related water is permitted.
- Interim status Part A authorization for the management of hazardous wastes under RCRA, administered by the Nevada DEP and U. S. EPA, Region IX.

Prior to January 25, 1983, the plant operated three onsite hazardous waste treatment, storage, or disposal units (HW-TSD units). All three units were designated hazardous because of low levels of chromium in the wastes. Two of these units were surface impoundments designated S-1 and P-1, for which closure/post-closure plans were submitted to Nevada DEP on April 9, 1984. Applicable data contained in the S-1 closure plan are included in Appendix III. An onsite HW landfill was used for the disposal of low-level chromium-bearing mud from the sodium chlorate cells. Disposal of HW to this landfill occurred before January 25, 1983, and the landfill has not received any waste since that

date. The locations of the landfill and impoundments S-1 and P-1 are shown in Figure 2, Appendix I.

After closure of the HW landfill, as well as surface impoundments S-1 and P-1, KMCC wishes to keep its generator status and dispose of all HW offsite at commercially permitted disposal facilities.

II. SUMMARY OF CLOSURE/POST-CLOSURE CARE PLAN [265.112(a)(i)]

This closure plan amends all closure plans previously prepared for the HW landfill at the Henderson Facility, and a copy is on file at the plant office. This plan, together with the closure/post-closure care plans for the surface impoundments submitted to NDEP on April 9, 1984, covers all HW TDS units at the Henderson Facility.

A copy of EPA form 3510, Part A application, as amended dated July 13, 1982, is attached in Appendix II. A survey plat, showing the location of the HW landfill cell and analytical data supporting the exclusion of ponds AP-1, AP-2, and AP-4, are also included in Appendix II.

Closure and post-closure care of the landfill will be done by the following major steps:

1. Leave contents of HW landfill in place and undisturbed.

2. Cover the landfill with a layer of compacted clay overlain with a 30-mil impervious membrane, suitably covered with native soil and topped with an erosion-resistant layer of native cover material. The cover components will extend 5 feet beyond the perimeter of the cell.

3. Grade, shape, and contour the cover to 3-5 percent slope, in accordance with engineering design and construction specifications given in Appendix IV.

4. Install diversion berms around the cell cover sufficient to protect against a once-in-25-year rainfall event.

5. Monitor and maintain site for 30 years, or petition NDEP for review when it is evident there is no impact on groundwater.

6. Proper notice will be made in the deed of the existence of the HW landfill and restricted use of the area.

7. Final closure inspection and certification by an independent registered P.E. with notification to the NDEP.

Details of the closure/post-closure care procedures are given in the pertinent sections of this plan, together with a final closure schedule.

III. CLOSURE PLAN DETAILS [265.112 and 265.310]

A. Maximum Inventory of Waste [265.112(a)(2)]

The landfill is inactive; no waste has been placed in it since January 25, 1983. All HW is now being transported offsite for disposal at the U. S. Ecology landfill in Beatty, Nevada.

The maximum volume of the cell is approximately 13,000 cubic yards. This estimate is based on the cell dimensions of 410' x 45' x 20', including 2 feet of freeboard. The cell contains an estimated 3,000 cubic yards of mud from the sodium chlorate process which was solidified with an equal volume of native soil. In addition, 2,900 cubic yards of contaminated soil from the closure of S-1 impoundment solidified with native soil was placed in the cell, together with the membrane from the bottom and sides.

The landfill was filled from back to front in truckload (approximately 20-yard) increments. The fill was solidified with native soil during operation and packed after each level or lift. The upper fill is comprised of native soil from beneath pond S-1 which was essentially clean and free of contamination. Analytical data submitted with the S-1 closure plan are provided in Appendix III.

Grab samples, taken at 4 points on the top of the landfill, were subjected to EP toxicity tests for chromium. The results are also reported in Appendix III and show no hazardous waste.

No other treatment or storage was given the waste.

As shown in Appendix IV, Cover Design and Construction Specifications, the cover and cap will extend 5 feet beyond the perimeter of the cell which insures that potentially contaminated areas will be safely covered. This is considered very conservative treatment in view of the absence of chromium in surface samples.

The surrounding area is free of contamination as determined by visual inspection, since the carbonaceous chrome-bearing waste is detectable by color.

B. Decontamination of Equipment [265.112(a)(3)]

As described above, the surface of the landfill is not hazardous. It will not be penetrated when the final cover is applied. Accordingly, no decontamination of equipment, tools, or clothing will be required.

C. Cover and Cap Design and Construction [265.112(a)(1); 265.310a]

1. Description

The existing cell will not be disturbed. No vibrating compaction equipment will be used as the fill is already compacted.

From the bottom to top, the cover will consist of the following layers:

a. A bottom low permeability layer of 1.5 feet of clay from the Clark County School District clay pit on Cheyenne Avenue, North Las Vegas, Nevada (or equivalent) will be placed over the cell.

The permeability of this clay was determined by an independent laboratory to be 4.7 x 10^{-8} cm/sec, using the falling-head method for determining saturated hydraulic conductivity. The sample was compacted at 90 percent relative compaction of ASTM D-1557 with a calculated porosity of 88 percent. A grain-size distribution was also performed by this outside consultant using ASTM D-422. The permeability of this material falls within RCRA's guideline of a saturated hydraulic conductivity of not more than 1 x 10^{-7} cm/sec. This clay will be spread in 6" lifts and compacted to 85 percent minimum relative compaction, according to ASTM D-1557. The clay will extend 5 feet in all directions beyond the perimeter of the cell to ensure that seepage does not occur around the edges. The overall dimensions of the cover will be approximately 55 feet wide by 420 feet long. The final slope of this layer will be finished at 3-5 percent.

b. A high-density polyethylene membrane, 30-mil thick, will be placed over the clay layer. The clay meets the EPA criteria for bedding

material (being no coarser than Universal Soil Classification [USCS] Sand [SP], which obviates the need for sand beds).

c. An overlying 6-inch layer of the same clay, used in the bottom layer, will be spread carefully, using rubber-tired equipment to prevent damage to the membrane. Final slope will be maintained at 3-5 percent.

d. A final cap will be placed over the clay, using 2 feet of compacted native soil (caliche), available on the site. This natural cover material is stable and erosion resistant to wind and the occasional rainfall events in the area (average: 3.76"/year, U. S. Geological Survey data).

   See data in Appendix IV.

e. Final slope of the cap will be 3-5 percent.

f. The engineering design and specifications for final grade, length of run, and slope of cover and cap are provided in Appendix IV.

g. Vegetative cover will not be used since there are no suitable grasses indigenous to the area that would improve or benefit the cap stability. Native vegetation is too sparse and stalky to provide surface cover, and the arid climate precludes turf culture.

h. On completion of the final cover and cap, a benchmark will be set at a reasonable location on the top to establish the elevation. This mark will be the reference point to determine settling and subsidence that may occur during post-closure maintenance. This benchmark will also be used for reference in providing notice in the deed and to local land authorities [265.119, 265.120].

2. Surface Water Control [265.310(b)(2)(3)]

The landfill is protected from flooding by its elevation and the nearby surface contour. A dike, roughly 20 feet high running almost east to west across the north end of the cell, prevents inflow from that direction. Figure 3, Survey Plat in Appendix II, shows these features.

Other surface water run-on will be controlled by constructing a diversion drainage berm around the cover as shown in the engineering drawing in Appendix IV.

Surface pooling will be prevented by proper slope and contour of the cover. There are no obstacles to the drainage path that might lead to ponding or excessive erosion.

Calculations in Appendix IV show that run-off from the cover will not cause excessive erosion of the surface because the gravel drains rapidly and the 3-5 percent slope will allow steady drainage without erosion. The internal membrane, as well as the compacted clay, will prevent any detrimental surface water percolation into the landfill. In the remote chance that surface water penetrates the cap and upper clay cover, the membrane will intercept and drain it away from the cell contents [265.310(b)(2)].

D. Climatological Consideration [265.310(c)(4)]

The Henderson, Nevada area is in the arid southwest region of the U. S. Data obtained from the U. S. Department of Commerce, National Oceanic and Atmosphere Administration, Environmental Data Service, and the USGS lists the average precipitation as 3.76" per year. Average monthly precipitation rates are reported in inches as follows:[1]

Jan.	0.45	May	0.10	Sept.	0.27
Feb.	0.30	June	0.09	Oct.	0.22
March	0.33	July	0.44	Nov.	0.43
April	0.27	Aug.	0.49	Dec.	0.37

The 10-year, 1-hour rainfall is approximately 0.8". The once-in-25-year rainfall event is reported at 2.4" in 24 hours; the once-in-100-year event is 3.0" in 24 hours (U. S. Weather Bureau).

We have been unable to locate any recorded data on rainfall pH. The National Climatic Data Center in Asheville, North Carolina, the U. S. EPA in San Francisco, the EPA Laboratory in Las Vegas, the Clark County, Nevada APCD, and the Desert Research Institute have indicated there is no program to measure pH of rainfall at this time.

[1]Climatography of the U. S. #81, National Climatic Center, Asheville, North Carolina, August, 1973.

Average net evaporation in the Henderson area is on the order of 90-96 inches per year. Natural solar and wind evaporation rapidly removes water from surface areas, and vertical penetration of rainfall is minimal.

As previously discussed, control of rainfall by surface diversion and containment structures will protect the landfill from run-on. Subsequent penetration of rainfall will be essentially nil.

E. Leachate Collection and Recovery System

For reasons given in Sections III, C and D, we believe there will not be any leachate, and a leachate collection and recovery system will not be installed.

F. Geological and Geochemical Consideration

1. Geologic Setting

The Henderson, Nevada, Kerr-McGee Facility is located at the southern edge of the Las Vegas Valley. The Valley is similar to a large bowl (with a bedrock bottom) filled with unconsolidated alluvial deposits. The Valley fill is comprised primarily of a thick sequence (at least 2,160 feet) of Quarternary-age, fine-grained materials known collectively as the Muddy Creek formation. Lithologically, the formation is characterized by thin layers of sand with some gravel interbedded with thick layers of silt and clay. Sediments of the Muddy Creek formation are typically light-colored, ranging from reddish tan to light green or white. Overlying the Muddy Creek formation at the plantsite is a relatively thin layer of alluvial fan deposits.

These alluvial sediments consist primarily of sand and gravel (with lesser amounts of silt and clay) derived from the erosion of the McCullough Range Mountains about one mile south of the Kerr-McGee property. Alluvial fans along the mountain front have overlapped to form coalescent alluvial fans with collectively similar deposits. Alluvial fan deposition occurred during the infrequent flood runoff periods which formed two basic types of deposits within the alluvial fans. The most widespread deposits consist of poorly sorted mixtures of boulders, cobbles, gravel, sand, silt, and clay. Distinct layers may be present in the

form of gravel beds cemented with caliche (calcium carbonate). Cutting through (and encased by) these poorly sorted deposits are stream or wash deposits consisting of moderately well-sorted deposits of sand and gravel resembling "gravel trains." These deposits are probably similar to sand and gravel in the wash channels present on the surface at the site. The "gravel trains" were buried by subsequent deposits of poorly sorted sediments and are characteristically narrow and linear in configuration. Thickness of these alluvial deposits range from 20 to 50 feet in the Kerr-McGee property area, with an overall average thickness of about 40 feet.

A distinct formation change between the alluvial sediments and the Muddy Creek formation generally does not exist. Normally, a 5- to 10-foot transitional zone occurs above the Muddy Creek where clay lenses are interbedded with sand and gravel.

Two generalized geologic cross sections were prepared to show the thickness and character of the overlying alluvial fan deposits, as well as the northerly slope of the surface of the Muddy Creek formation. Figure 1 represents a typical east-west profile through the Kerr-McGee plantsite. Figure 2 represents a typical north-south profile through the Kerr-McGee plantsite. Lithologic logs for the landfill area are enclosed in Figures 3 through 5 and Tables 1 through 4.

2. Hydrologic Setting

Groundwater in the Las Vegas Valley occurs under artesian and semi-artesian conditions. Regionally, there are three principal artesian aquifer zones within the Muddy Creek formation. The so-called shallow, middle, and deep artesian zones are tapped by wells at about 200 to 450, 500 and 700 feet, respectively, in the Las Vegas Valley. A fourth water-bearing zone is found overlying the top of the Muddy Creek formation, usually in the alluvial sand and gravel.

The primary source of recharge is runoff from precipitation occurring in the surrounding mountains which infiltrates the alluvium along the Valley margins. Rainfall (less than 5 inches annually) occurring in the Valley itself is consumed by evaporation and transpiration by

vegetation. Therefore, the near-surface aquifer receives little or no direct recharge from infiltrating rainfall and is recharged by upward leakage from deeper aquifers and recharge from the infiltration of water applied to the land surface in the forms of irrigation and waste-water discharges to unlined ditches.

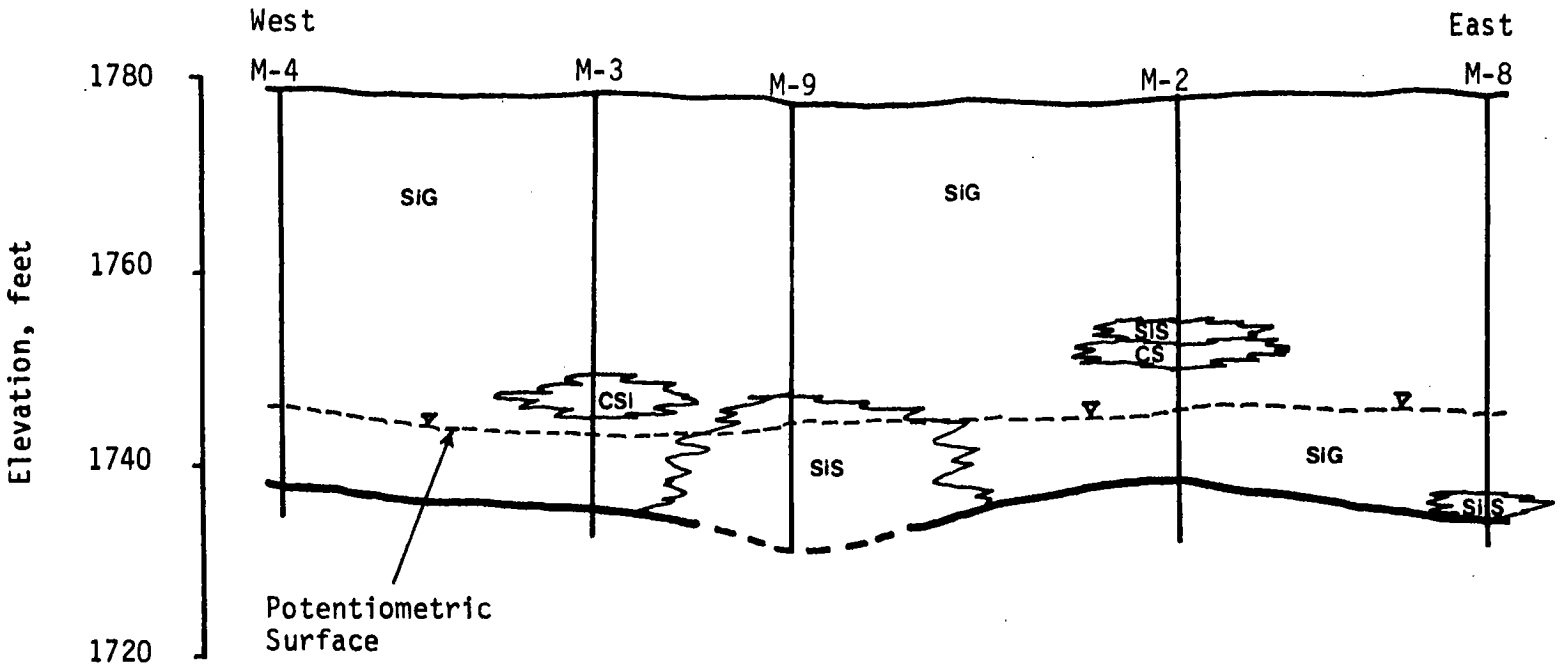
Groundwater from the shallow, middle, and deep aquifers is discharged from the system through springs and pumping wells in Las Vegas Valley. In the Henderson area, groundwater from the near-surface water-bearing alluvial deposits is discharged by seepage into Las Vegas Wash, as well as by evapotranspiration, but not by any known pumping wells.

Based on test drilling results near the Kerr-McGee plantsite, groundwater occurs in the near-surface alluvial deposits at depths ranging from about 20 feet (at the northern property boundary) to 50+ feet below land surface (at the southern property boundary). The groundwater in the near-surface alluvial deposits occur at the top of the Muddy Creek formation, perched on and/or confined by clay layers in the transitional zone above the Muddy Creek formation, and within the uppermost part of the Muddy Creek formation where it may be confined by a layer of caliche.

The alluvial-saturated zone is typically unconfined; however, varying degrees of confinement may be present, depending on the clay or caliche layers in the transitional zone above the Muddy Creek.

Estimating the saturated thickness of the near-surface water-bearing zone is made difficult by the variable layering within the transition zone above the Muddy Creek formation. However, the near-surface water-bearing zone ranges in saturated thickness from less than 1 foot in the southern area to 20+ feet at the northern property boundary.

The primary geologic factors affecting groundwater occurrence and movement in the Kerr-McGee plant area are the presence of relatively high-permeability zones in the form of "gravel trains," the slope configuration of the surface of the Muddy Creek formation, and the lithology of the Muddy Creek formation. These factors affect the distribution of permeability, the



EXPLANATION:

S = Sand/Sandy

C = Clay/Clayey

Si = Silt/Silty

G = Gravel/Gravelly

FIGURE 1: Generalized East-West Geological Cross-Section through the Kerr-McGee Henderson Facility.

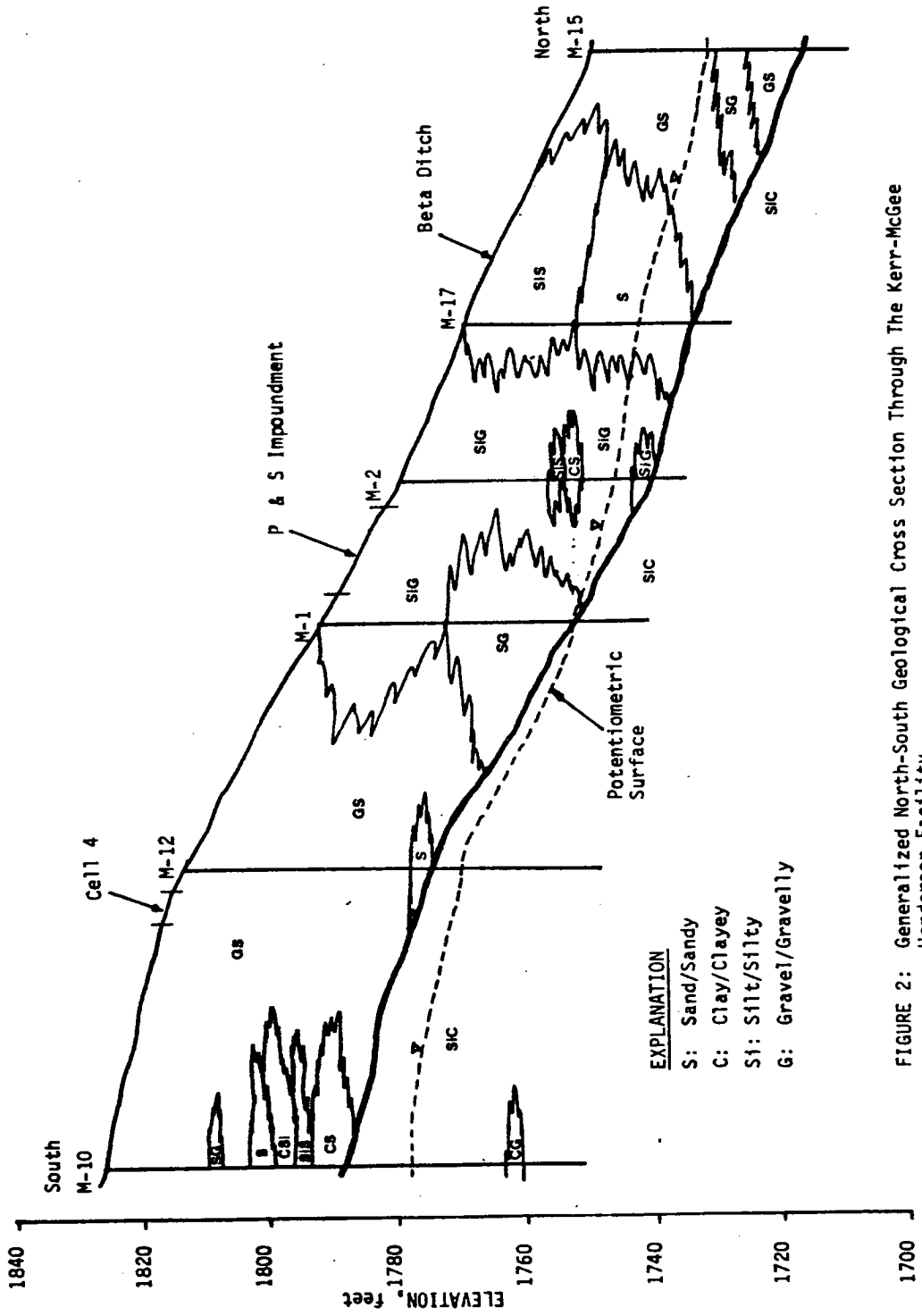
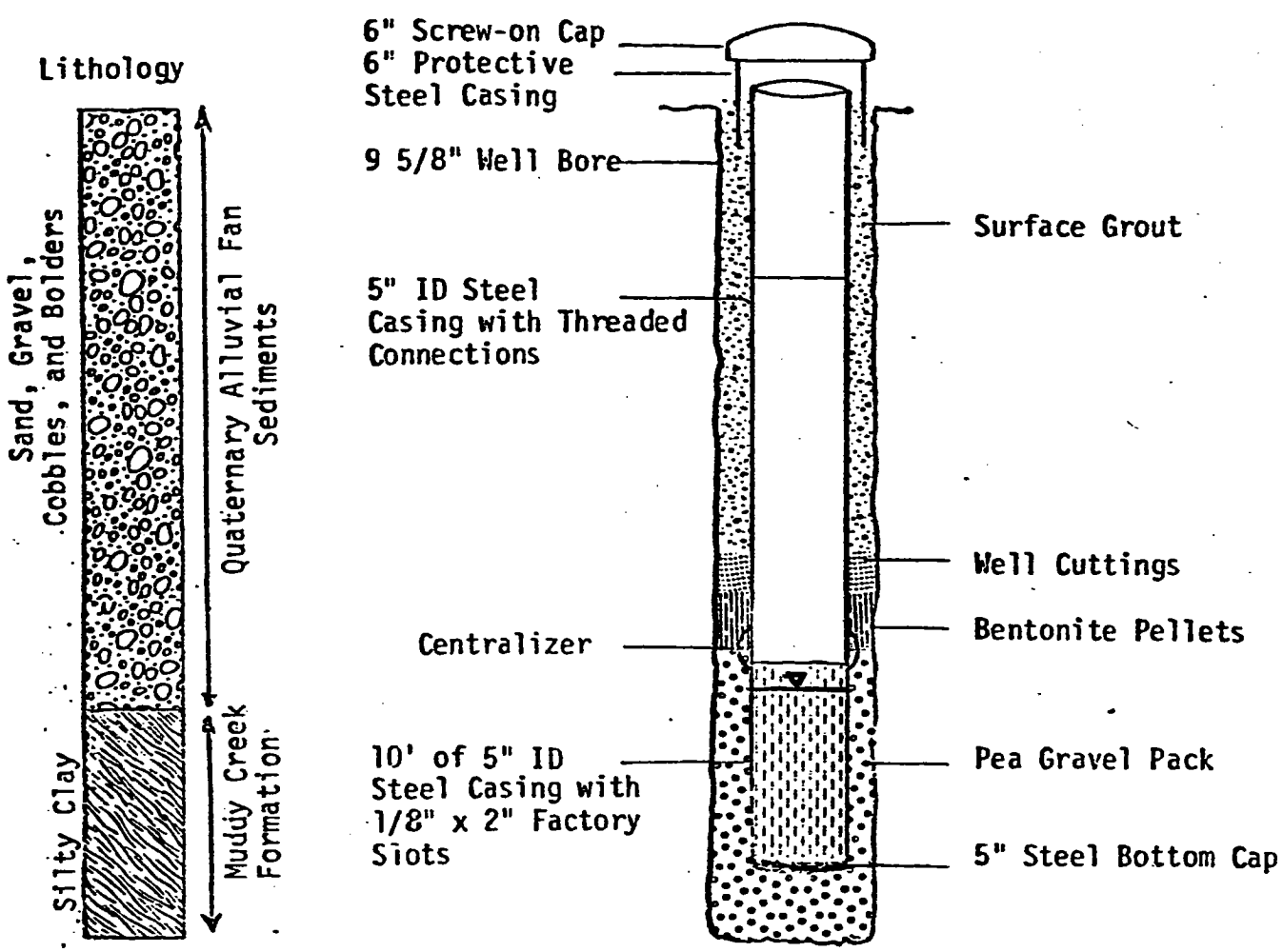


FIGURE 2: Generalized North-South Geological Cross Section Through The Kerr-McGee Henderson Facility.

FIGURE 3:
K-M Chemical Corporation
Henderson, Nevada Facility
Well No. M-5

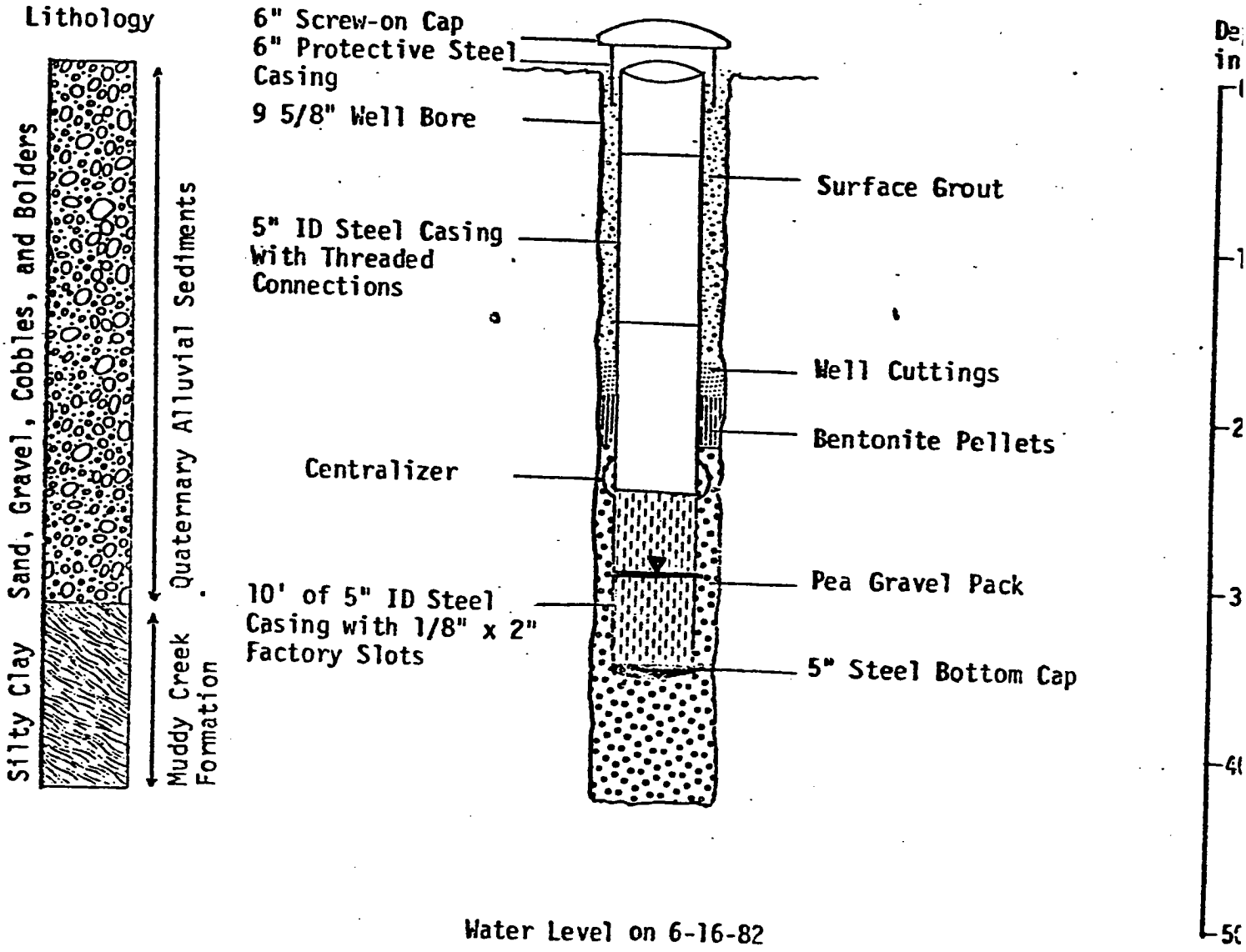


Water Level on 6-16-82

31' 4 3/8"

Measured from Top of Protective Casing

FIGURE 4:
K-M Chemical Corporation
Henderson, Nevada Facility
Well No. M-6

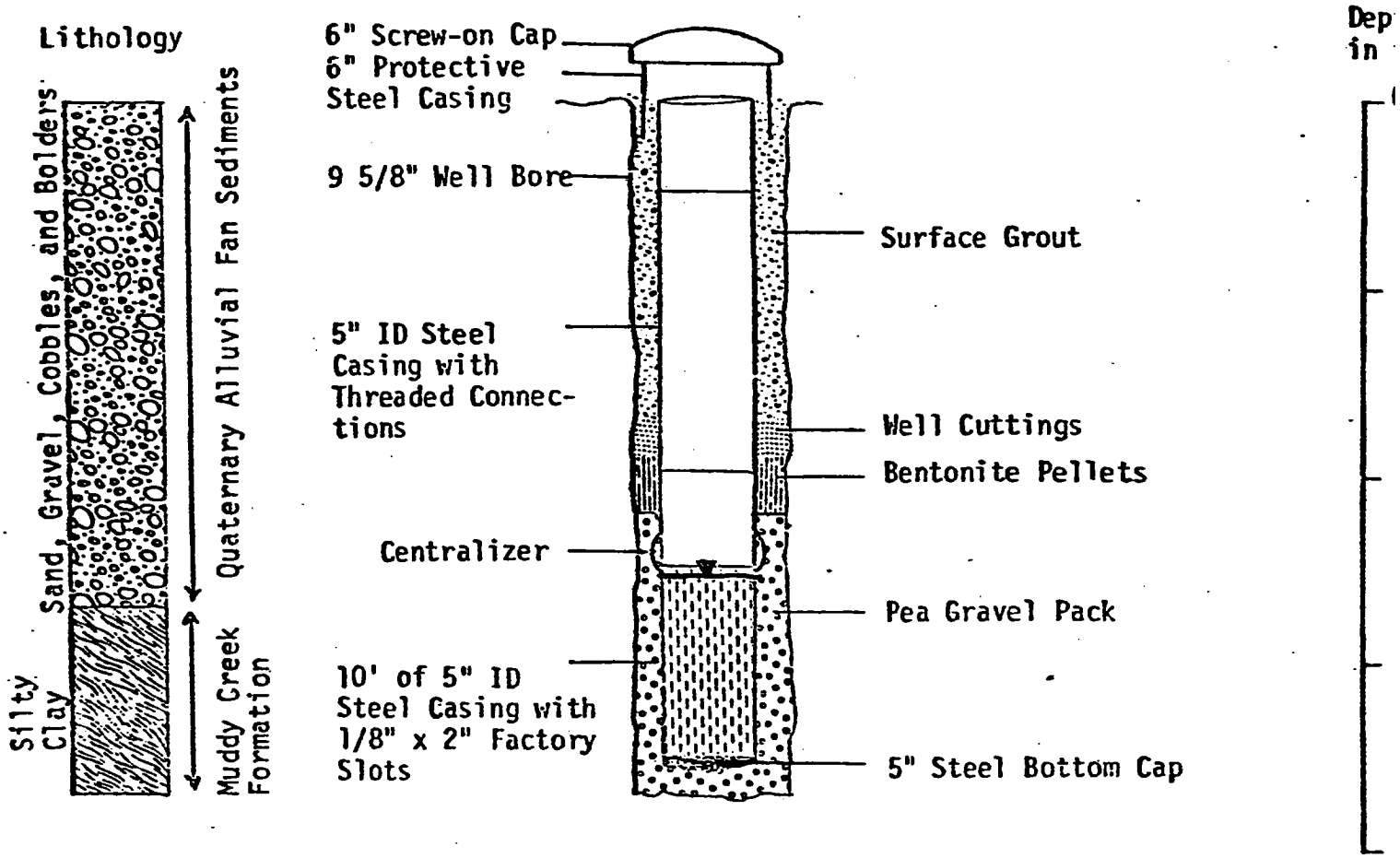


Water Level on 6-16-82

31' 4"

Measured from Top of Protective Casing

FIGURE 5:
K-M Chemical Corporation
Henderson, Nevada Facility
Well No. M-7



Water Level on 6-16-82

27' 11 3/4"

Measured from Top of Protective Casing

TABLE 1: Lithology Log for Henderson Well No. M-5

Depth in Feet	Lithology Description
0-12.0	Silty sandy gravel
12.0-15.0	Partially cemented sand and gravel
15.0-20.0	Cobbles
20.0-23.0	Silty sand and gravel
23.0-24.5	Gravel and sand with cobbles
24.5-25.5	White clay and gravel with gypsum and cobbles
25.5-28.0	Brown clayey silt with about 50% gypsum
28.0-31.0	Brown clayey silt with sand and gravel and white streaks
31.0-43.0	Brown clay with occasional thin caliche lenses

Top of Muddy Creek at 31 feet

TABLE 2: Lithology Log for Henderson Well No. M-6

Depth in Feet	Lithology Description
0-29.0	Silty gravel and sand; slightly cemented from 12' - 13'
29.0-32.0	Silty sand and gravel with gypsum
32.0-32.5	Brown silty clay
32.5-34.0	Silty sand and gravel
34.0-38.0	Brown silty clay
38.0-43.0	Brown clay with sand and gravel

Top of Muddy Creek at 32 feet

TABLE 3: Lithology Log for Henderson Well No. M-7

Depth in Feet	Lithology Description
0-15.0	Silty gravel and sand
15.0-18.0	Silty gravel and sand with gypsum
18.0-22.5	Silty gravel and sand with abundant gypsum; approximately 40% gypsum
22.5-28.0	Light brown silty clay with thin beds of caliche. Cemented from 27' - 27.5'
28.0-29.5	Clayey gravel (Not cemented)
29.5-37.0	Brown silty clay.

Top of Muddy Creek at 29.5'

TABLE 4: LITHOLOGY LOG

FOR HENDERSON

WELL NO. H-28

Description	Depth Below Land Surface (feet)
Sand, silty to clayey, grayish-brown very fine to very coarse (poorly sorted), and gravel, pebbles, cobbles and boulders, rounded to subangular; also with layers of caliche and caliche-cemented sand and gravel	0 - 44½
Clay, silty, to silt, clayey, light brown with traces of sand and gravel in matrix; also, with occasional thin layers of sand, reworked caliche, and caliche (Muddy Creek Formation)	44½ - 51

Data from Geraghty and Miller, Inc., October, 1980.

water-table configuration, and the vertical extent of water-bearing zones. The groundwater in the near-surface alluvial deposits flows north-northwest.

G. Groundwater Monitoring

Kerr-McGee Chemical Corporation has installed 8 RCRA monitoring wells around the hazardous-waste sites located at the Henderson Facility. Samples from the 4 wells serving the landfill site, M-5, M-6, M-7, and H-28, have been taken and analyzed for the RCRA drinking-water, water-quality-and-contamination-indication parameter over the past two years with background data being obtained during 1983. Chromium as a contaminant present in process operations and waste was added to the list of chemicals tested for during groundwater sampling.

The four RCRA wells at the landfill will continue to be sampled during closure/post-closure on a semi-annual basis in June and December with the results and the subsequent evaluation forwarded to the Nevada DEP within 30 days of receiving lab results. The groundwater quality parameters which will be checked are pH, specific conductance, TOC, TOH, chromium, chloride, sodium, sulfate, iron, manganese, and phenols.

Since chromium is the item of concern for this waste, a sample will be taken from each well monthly and analyzed from chromium only. Water levels of all wells will also be recorded monthly.

H. Special Requirements

1. Ignitable or Reactive Wastes [265.312]

The wastes are not reactive or ignitable and require no special treatment, stabilization or security provisions.

2. Incompatible Wastes [265.313]

All wastes in the landfill are fully compatible and have been in place for over 18 months.

3. Liquid Waste [265.314]

All waste was placed prior to January 26, 1983. All waste was solidified with native soil to eliminate any liquid that may have been present.

4. Containerized [265.315]

No containers, either empty, crushed or containing hazardous material, were placed in this landfill during its life.

IV. POST-CLOSURE CARE AND MAINTENANCE PLAN

1. Final Cover [265.310(b)(1)(4)]

a. The erosion-resistant cover will be inspected routinely on the first Wednesday of each month for visible evidence of surface deterioration by the Environmental Supervisor or his designated inspector. A written record will be kept of these inspections by the plant Environmental Supervisor.

b. Remedial maintenance will be taken within 5 working days to repair any observed defects. Records will be kept of this work by the Environmental Supervisor.

c. Special inspections will be made after each severe event, i.e., precipitation in excess of 0.5 inch in 24 hours, or high wind conditions equivalent to gale velocity during dry periods.

d. At least once a year (week of July 15), the elevation of the benchmark will be checked for subsidence and stability of the fill. The slope of the cover will be restored to 3 percent if any subsidence has changed the contour of the cover. The significance of any change in elevation will be assessed and the NDEP notified of any appropriate maintenance that is done.

e. At least once a year (week of July 15), and more often if inspection indicates the need, the erosion-resistant cap will be renewed and a slope of 3 percent maintained along its length.

f. Signs will be posted around the covered landfill to identify the perimeter, restrict access, and prevent unauthorized vehicular movement over the cap.

2. Groundwater Quality Monitoring

a. The groundwater-monitoring program around the landfill will continue for 30 years. Sampling, analysis, and reporting to NDEP will be done semi-annually or more frequently as directed by the NDEP. Groundwater quality parameters

will include pH, specific conductance, TOC, TOH, and Cr. Samples will be collected from monitor wells M-5, M-6, M-7, and H-28.

b. Permission to terminate this monitoring program may be requested from the NDEP when groundwater quality assessment data indicate no impact from the landfill for a period of 24 consecutive months.

c. To insure that the groundwater-monitoring system remains functional, monthly checks of each of the four wells will be made. They will be checked for water level and signs of silting, as well as any tampering of the well-closure cap. To prevent unauthorized personnel from removing the well cap, a lock will be installed with the key kept in the plant master key lock-box. If any signs are found that tampering has occurred with any well, a sample will be taken and analyzed. If the well is determined unserviceable, a new well will be installed to replace it and maintain the integrity of the monitoring system.

3. Facility Manager's Checklist for Post-Closure Care

a. First Wednesday of each month:

1) Inspect cap for evidence of visible deterioration.

2) Perform necessary maintenance.

3) Keep written records of inspection and maintenance.

4) Check well cap for tampering and well for siltation; then measure and record.

5) Sample wells M-5, M-6, M-7, and H-28 and analyze for chromium.

b. After heavy rainfall or windstorm event:

1) Inspect cap for evidence of deterioration.

2) Perform necessary maintenance.

3) Keep written records of inspection and maintnenance.

c. Week of July 15, annually:

1) Check elevation of benchmark.

2) Renew erosion-resistant cap and slope (more often as needed).

3) Keep written records of same.

d. Semi-annual groundwater monitoring and reporting:

1) Sample and analyze monitor wells around the landfill every December and June.

2) Assess data and report to NDEP within 30 days after receiving laboratory results.

4. Facility Contact

During closure activities and post-closure care, contact with the facility should be made as follows:

a. Facility Manager
Kerr-McGee Chemical Corporation
P. O. Box 55
Henderson, Nevada 89015
Phone (702) 565-8901

Rolfe B. Chase, Jr., is Facility Manager as of June 1, 1984.

b. Environmental Supervisor
Kerr-McGee Chemical Corporation
P. O. Box 55
Henderson, Nevada 89015
Phone (702) 565-8901

F. R. Stater is Environmental Supervisor as of June 1, 1984.

V. CERTIFICATION OF CLOSURE [265.115]

An independent professional engineer, registered in the State of Nevada, will be engaged to inspect the closure proceedings for compliance with the approved plan.

The PE will make inspection at each of the following stages of closure:

1. Prior to any closure activities to verify no additional waste has been added.

2. Upon completion of the application of the low permeability layer, verify coverage, depth, compaction, and slope of finished lift.

3. Upon completion of the installation of the protective membrane to insure seams are according to drawing and thickness meets specifications.

4. Upon final completion of top cover, insure the final slope of 3-5 percent is maintained and the drainage around the waste cell matches the engineering drawings as specified in this closure.

Certification of proper closure will be submitted by KMCC and the registered PE to the Director, NDEP, and the Regional Administrator, U. S. EPA, within 30 days after all work has been completed and inspected.

VI. PROPERTY RESTRICTIONS

1. Post-Closure Use [265.117]

The closed landfill will not be used in a manner that will disturb the integrity of the final cover unless KMCC demonstrates to the satisfaction of the Director, NDEP, that any contemplated use would not create a hazard to health or the environment.

Within the foreseeable future (year 2015), there is enough land within the existing property to satisfy all anticipated land use requirements without disturbing the landfill site.

2. Notice to Local Authorities [265.119]

Kerr-McGee will promptly notify the Clark County Recorder and the Director, NDEP, by providing within 90 days after closure a final plat showing the location and dimensions of the closed landfill. The benchmark set in the cover will be used for this identification. A registered land surveyor will prepare and certify this plat.

3. Notice in Property Deed [265.120]

KMCC, the property owner, will record with the Clark County Recorder of Deeds a notification on the deed to the facility property that will in perpetuity notify any potential or future purchaser that the land has been used for HW disposal and its use is restricted under 40 CFR 265.117(c).

VII. COST ESTIMATES

A. Cost Estimates for Closure [265.142]

Cost estimates for closure are shown in Table 5. The cost estimate for closing the landfill is based

TABLE 5 - CLOSURE COST ESTIMATE

The following cost estimate for installation of the landfill cap is based on the design specifications contained in Appendix IV:

1.	Low Permeability Layer		
	Material: 2,000 yd.^{3} clay x $15/yd.^{3}	$30,000	
	Installation: 2,000 yd.^{3} clay x $ 3/yd.^{3}	6,000	
	Total		$ 36,000
2.	Synthetic Membrane		
	Material: 30 mil HDPE 24,000 ft.^{2} x $0.27	$ 6,500	
	Installation: 30 mil HDPE 24,000 ft.^{2} x $0.50	12,000	
	Total		$ 18,500
3.	Protective Layer		
	Material: 450 yd.^{3} clay x $15/yd.^{3}	$ 6,750	
	Installation: 450 yd.^{3} clay x $ 2/yd.^{3}	900	
	Total		$ 7,650
4.	Final Cap - Drainage and Protective Layers		
	Material: 1,750 yd.^{3} native soil x $10/yd.^{3}	$17,500	
	Installation: 1,750 yd.^{3} native soil x $ 2/yd.^{3}	3,500	
	Total		$ 21,000
5.	Grading for Drainage		
	Total		$ 10,000
6.	Miscellaneous Costs		
	Installation of BM:	$ 1,500	
	PE Certification:	500	
	Administrative:	3,000	
	Total		$ 5,000
	Total Closure Cost		$ 98,150
	10% Contingency		9,800
			$107,950

on the procedure proposed in this plan and on 1984 costs. These estimated costs will be escalated by the 1984 inflation factors if approval of this plan is delayed beyond December 31, 1984.

B. Cost Estimate for Post-Closure Care [265.144]

Post-closure cost estimates are given in Table 6. The cost for post-closure care is based on 1984 estimated costs for site mainntenance, sampling and analysis of groundwater-monitor wells, and reporting thereof.

Post-closure care for 30 years, beginning June, 1985, is forecasted. Annual revision of the post-closure cost estimates will be provided within 30 days of each anniversary date of final closure to reflect inflation and any changes that may occur in the plan. A copy of the annual revision to the post-closure plan will be kept at the Henderson Facility office.

VIII. FINANCIAL ASSURANCE

A. Financial Assurance for Closure [265.143]

Attached in Appendix V is the letter from the Chief Financial Officer of Kerr-McGee Corporation to demonstrate financial assurance of closure as specified in 40 CFR 265.143.

Also attached is a certificate of liability insurance for a HW facility provided by Harbor Insurance Company, Policy No. HI-167898.

B. Financial Assurance for Post-Closure Care and Groundwater Monitoring and Maintenance [265.145]

The same documents to meet the requirements of 265.143 apply to 265.145.

IX. CLOSURE TIME SCHEDULE

KMCC is prepared to begin closure within 7 days after notification of approval of the closure/post-closure plan by the NDEP.

The chronological listing and checkpoints for increments of progress are listed below. A bar chart, showing time versus activity, follows in Figure 6 to show simultaneous activities that may occur.

TABLE 6 - COST ESTIMATE FOR POST-CLOSURE CARE

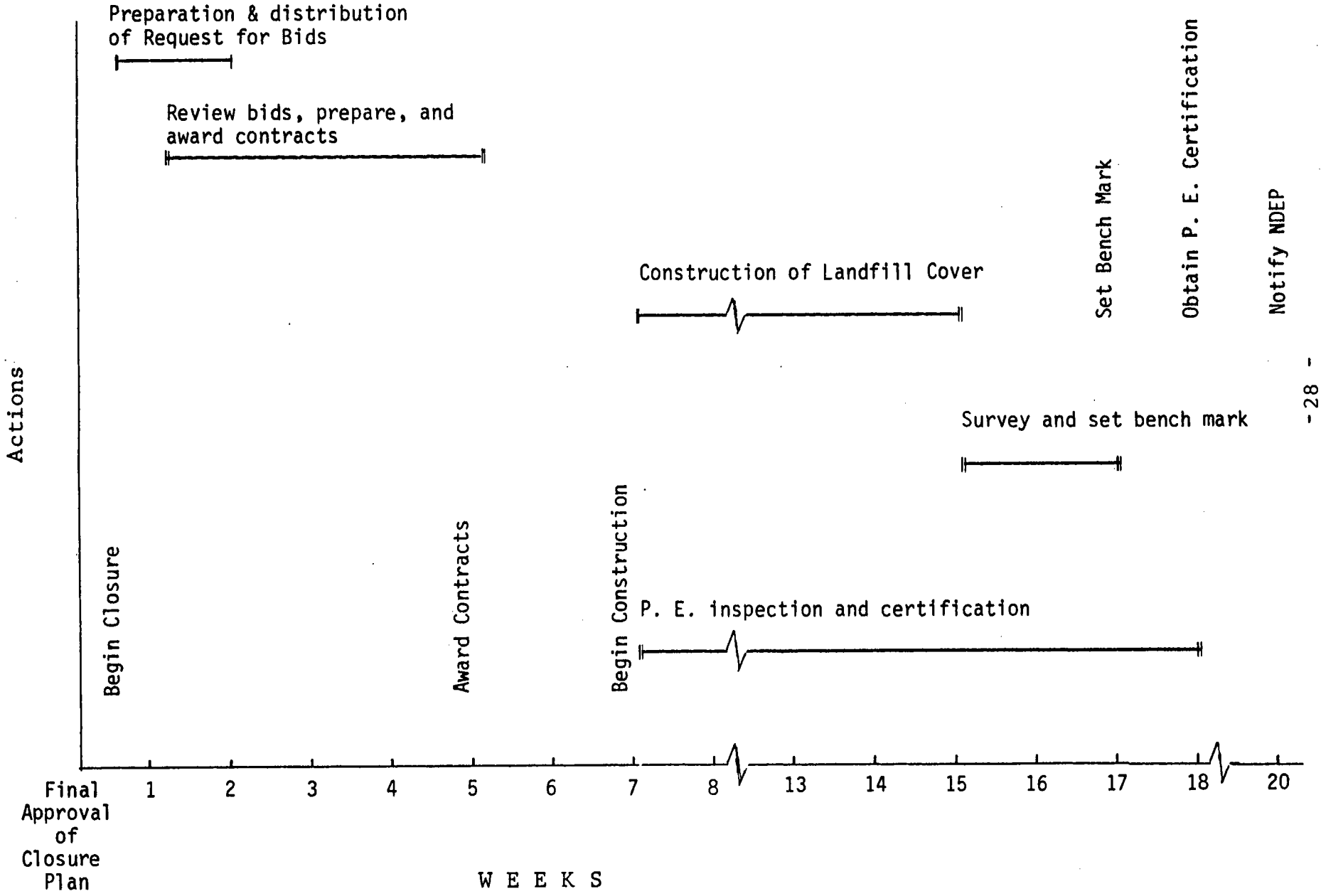
[265.144]

1.	Inspections and Recordkeeping		
	a) One per week		52
	b) Special events (precipitation, high winds, etc.) Assume 10 = Total 62 62 x 1/2 hour = 31 hours - 31 x $15		$ 500
2.	Maintenance of Cover and Drainage Swales		
	Assume restoration of top cover and drainage swales once per year		$ 2,000
3.	Annual Subsidence Check		$ 1,000
4.	Groundwater Monitoring		
	a) Sampling and Analysis	$6,000	
	b) Maintenance	500	
	Total		$ 6,500
Total Post-Closure Costs/Year			$ 10,000
For 30 Years			$300,000

Time Frame	Action
0	1. Approval of Closure Plan
Within 1 week	2. Begin preparation of requests for bids for installation of cover, survey work, and PE services
Within 5 weeks	3. Award contracts
Within 7 weeks	4. Begin construction of landfill cover
Within 15 weeks	5. Completion of landfill cover
Within 17 weeks	6. Survey and set benchmark
Within 18 weeks	7. Obtain PE Certification
Within 20 weeks	8. Notify NDEP of completion

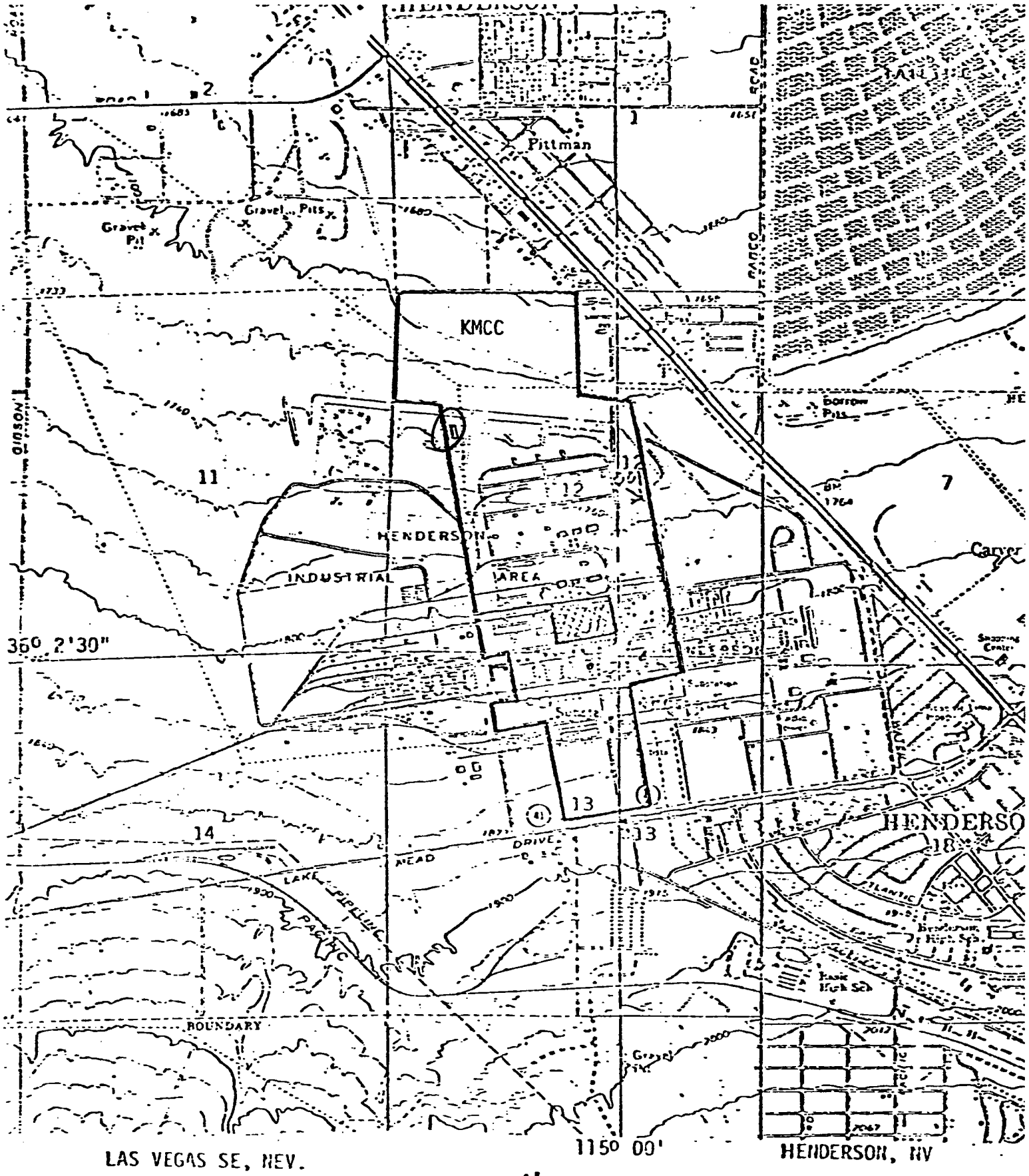
FIGURE 6:

LANDFILL CLOSURE TIME SCHEDULE



APPENDIX I

Figure 1	Location Map of Henderson Facility	30
Figure 2	Location Map of HW Management Units and RCRA Monitoring Wells	31



LOCATION MAP

Figure 7

LOCA[illegible]N OF RCRA GROUND-WATER [illegible] Facility

Kerr-McGee Chemical Corporation's Rend[illegible]

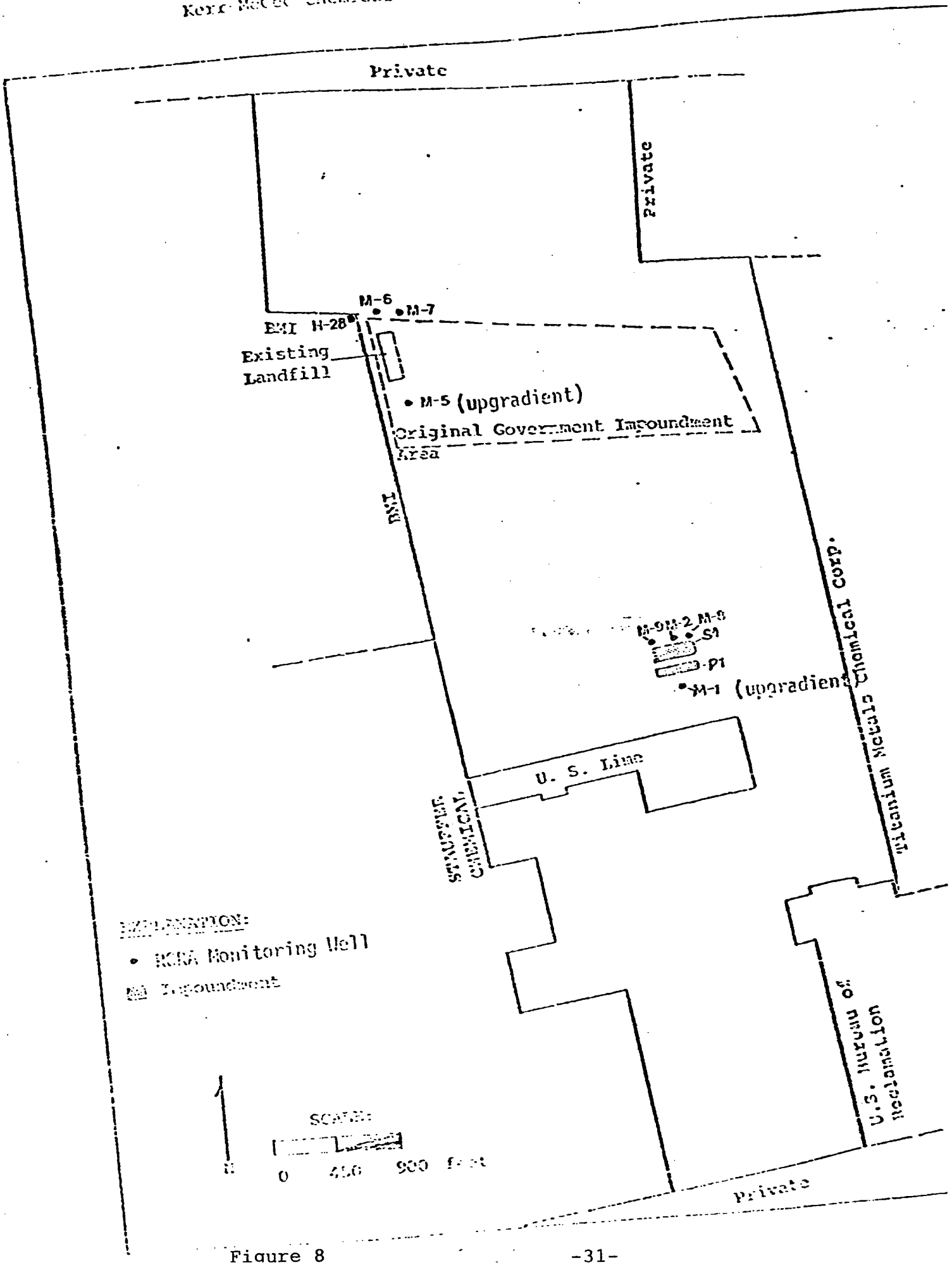
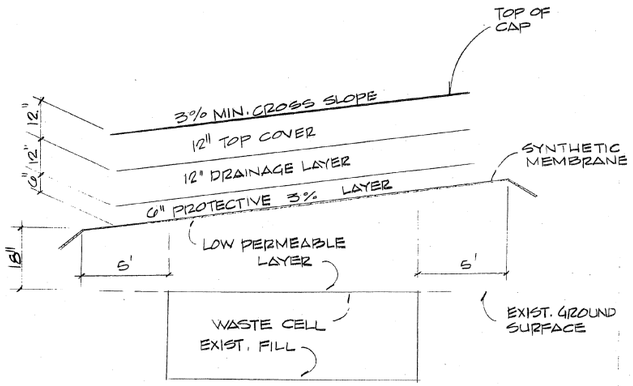
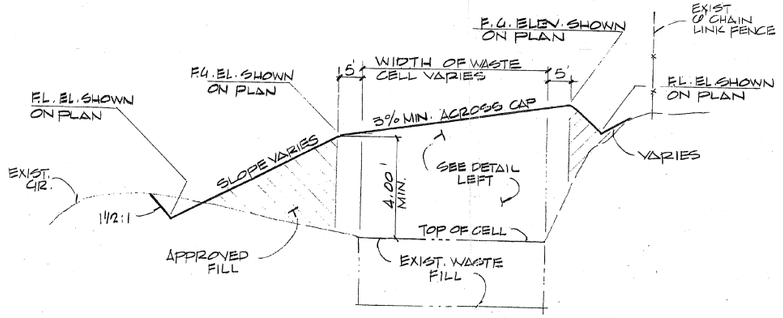


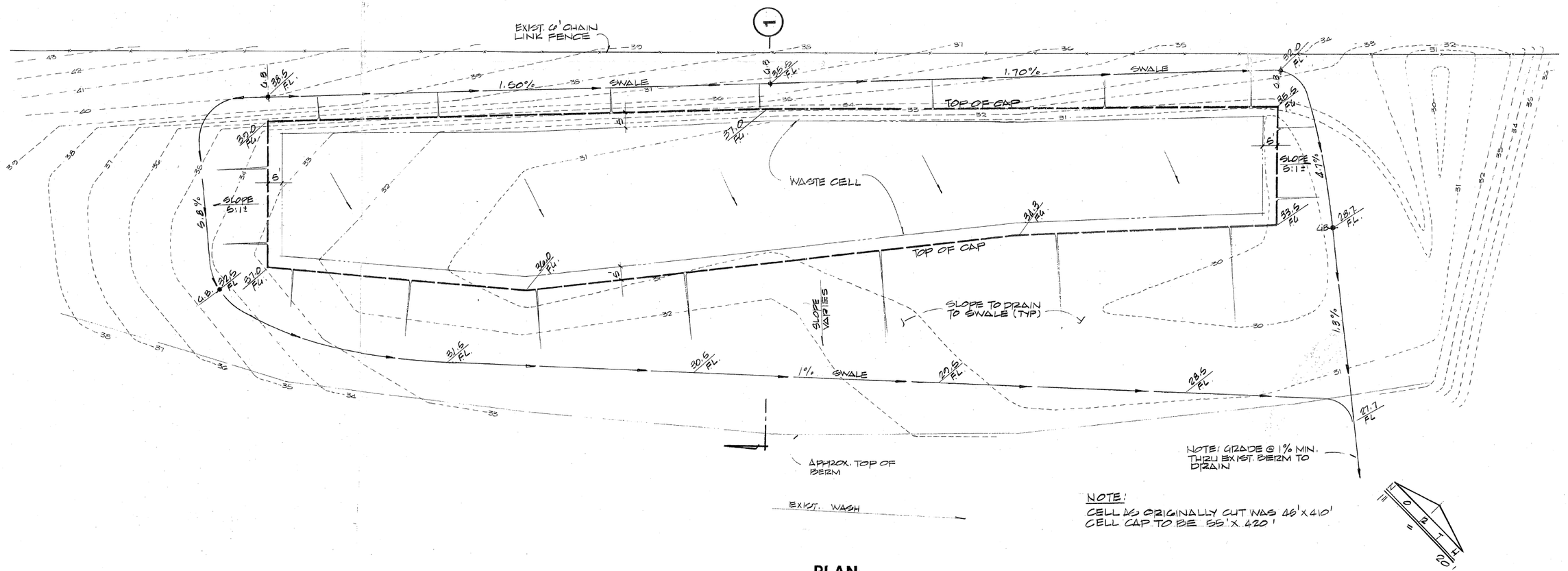
Figure 8



DETAIL



SECTION 1



PLAN

DATE	REVISIONS
6-13-84	REVISED CAP THICKNESS PER 6-12-84 MG LEE

HENGINEERING AND MANAGEMENT, INC.
3549 SOUTH INDUSTRIAL ROAD, SUITE 9
LAS VEGAS, NEVADA 89109
(702) 734-8444

KERR MCGEE

WASTE CELL CAP PLAN & DETAILS

SHEET NO. 1

2/21/84

APPENDIX II

1	Form 3510, Part A, Application as Amended dated July 13, 1982	33
2	Figure 3: Survey Plat of Landfill	46

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

July 14, 1982

CERTIFIED MAIL NO. P26 0233690

Mr. William D. Wilson, Chief
Technical Assessment Section and
Waste Management Division
U. S. Environmental Protection Agency
Region IX
215 Fremont Street
San Francisco, CA 94105

Subject: Revised Part A Permit Application
Kerr-McGee Chemical Corporation
EPA ID No. NVD 008290330

Dear Mr. Wilson:

On November 14, 1982, a Part A, *Application for a Hazardous Waste Permit*, was filed for Kerr-McGee Chemical Corporation's (KMCC) Henderson, Nevada operations. This application was filed, based on our understanding of the RCRA regulations then in force.

In this application to EPA, KMCC identified certain units incorrectly or unnecessarily as being subject to RCRA interim status requirements. Therefore, we are submitting a Part A application revised to incorporate these changes as follows:

Form 1 - pages 1 through 3 with USGS topographical map

Form 3 - pages 1 through 5, including a revised facility drawing

These revisions amend the original Part A application and reflect the latest regulatory changes to RCRA. It is our understanding that interim status will still be in effect for this facility after these revisions.

These changes are listed below:

1. Capacities of existing surface impoundments, P-1 and S-1, as shown on facility diagram are hereby corrected from 960,000 to 2,660,000 gallons.

2. A process tank used solely for neutralization of a corrosive liquid was incorrectly listed and has been deleted in the revised permit application.

3. The chlorate cell vacuum filtration unit from which liquids are recycled back to the facility was incorrectly listed as a hazardous waste processing unit and has been deleted in the revised permit application.

4. Lined ponds P-2 and P-3 receive dilute solutions from the sodium chlorate and perchlorate electrolytic cell buildings and recycle to chlorate process. These are not within the definition of solid waste and have been deleted from the revised permit application.

5. Other storage ponds (AP-1, AP-2, AP-4) were reported because preliminary in-house testing indicated they might contain Cr in excess of the EP toxicity test levels. Sampling and testing by the Desert Research Institute of the liquid and sludge in those ponds determined that all eight metals were well below the EP toxicity test limits (copy, summary attached).

Please contact me if you have any questions on this subject.

Sincerely,

C. B. Armstrong
Plant Manager

CBA:jc
Attachments

xc: H. LaVerne Rosse, PE Director
Waste Management Program
Nevada Dept. of Conservation
and Natural Resources
Carson City, NV 89710

bcc: EAAnglada-OKC
JRKelley-OKC
SHPia
JHStallings-OKC
RFWohletz

GENERAL

Consolidated Permits Program

(Read the "General Instructions" before starting.)

N V D 0 0 8 2 9 0 3 3 0

LABEL ITEMS

I. EPA I.D. NUMBER

II. FACILITY NAME

III. FACILITY MAILING ADDRESS

IV. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete Items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK YES	NO
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X			D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X

III. NAME OF FACILITY

1 SKIP: K E R R - M C G E E C H E M I C A L C O R P O R A T I O N

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 A R M S T R O N G , C . B . , P L A N T M A N A G E R	7 0 2 - 5 6 5 - 8 9 0 1

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 P . O . B O X 5 5

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 H E N D E R S O N	N V	8 9 0 1 5

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 L A K E M E A D D R I V E

B. COUNTY NAME

C L A R K

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 H E N D E R S O N	N V	8 9 0 1 5	

A. FIRST (specify) 19 SEE ITEM XII BELOW

B. SECOND (specify) 7

C. THIRD (specify)

D. FOURTH (specify) 7

OPERATOR INFORMATION

A. NAME: KERR-MCGEE CHEMICAL CORPORATION

B. Is the name listed in Item VIII-A also the owner? YES NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify)
P

D. PHONE (area code & no.): A 702 565 8901

E. STREET OR P.O. BOX: P.O. BOX 55

F. CITY OR TOWN: HENDERSON

G. STATE: NV

H. ZIP CODE: 89015

IX. INDIAN LAND
Is the facility located on Indian lands? YES NO

EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N NV0000078

B. UIC (Underground Injection of Fluids): U

C. RCRA (Hazardous Wastes): R

D. PSD (Air Emissions from Proposed Sources): 9 P

E. OTHER (specify): 9 AIR LOCAL

(specify) 22 Permits Issued by APCD, Clark County Health Dis

E. OTHER (specify):

(specify)

MAP

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

XI. NATURE OF BUSINESS (provide a brief description)

Manufacutre of industrial chemicals, including sodium chlorate, ammonium perchlorate, potassium perchlorate, manganese dioxide, boron trichloride, boron tribromide, elemental iron.

XII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

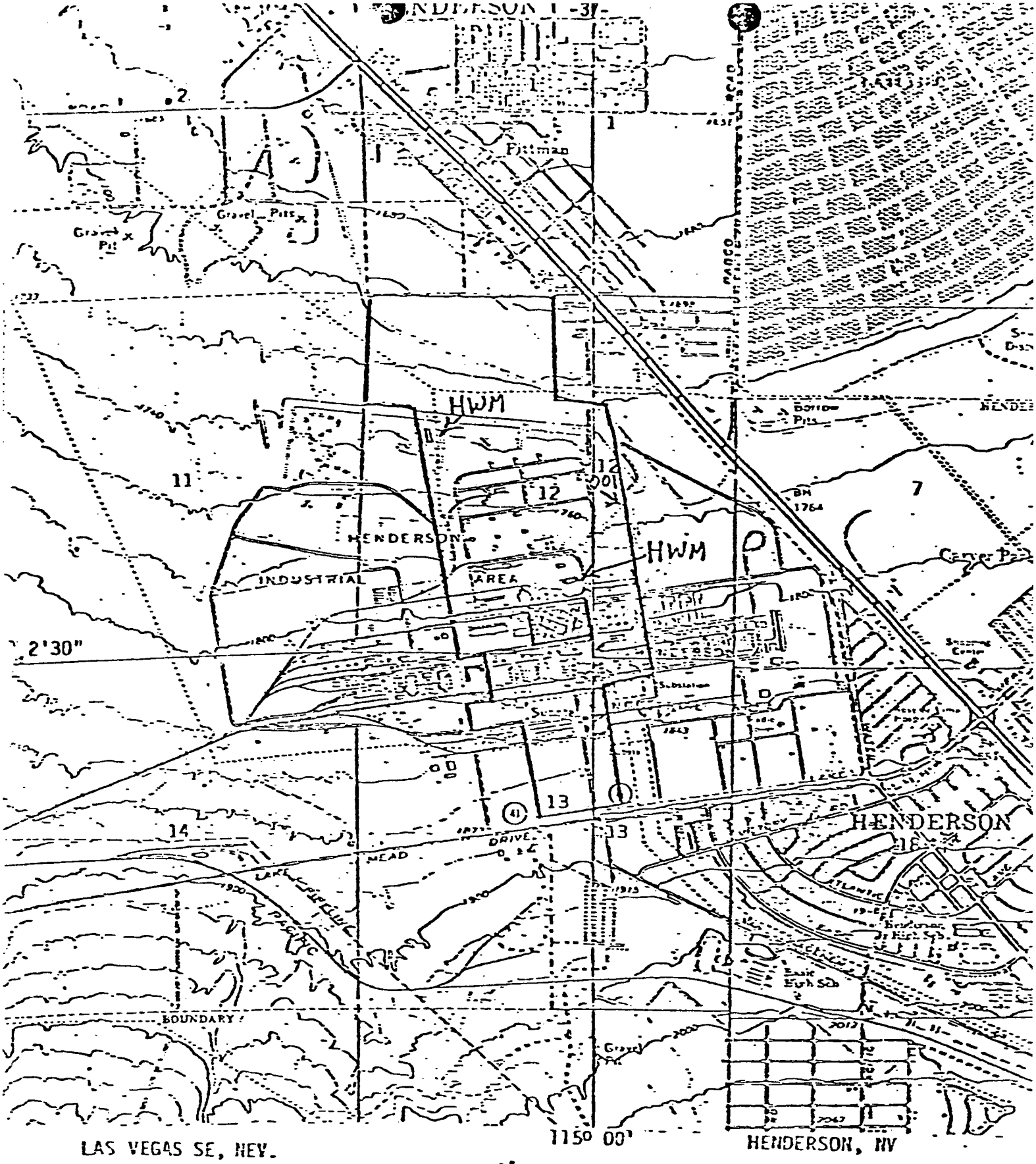
A. NAME & OFFICIAL TITLE (type or print): J. R. Kelley, Vice President/ Gen. Mgr. Electrolytic Products

B. SIGNATURE: J R Kelley

C. DATE SIGNED: 7-13-84

COMMENTS FOR OFFICIAL USE ONLY

EPA Form 3510-1 (6-80) REVERSE


HWM
HENDERSON
INDUSTRIAL
AREA
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Pittman
Gravel Pit
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BOUNDARY
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LAKE MEAD
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HENDERSON, NV
N
SCALE 1:24,000
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1 Mile

EPA | HAZARDOUS WASTE PERMIT APPLICATION

Hazardous Waste Permit Program

(This information is required under Section 3005 of RCRA.) – 3

I.D. NUMBER: N V 0 0 0 8 2 9 0 3 3 0

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

I. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR. | MO. | DAY

☐ 2. NEW FACILITY *(Complete Item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR. | MO. | DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☒ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

II. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

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

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	G

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP C 1

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	S02	600	G	
X-2	T03	20	E	
1	S01	275	G	
2	D80	44	A	
3	D83	2,660,000	G	
4				
5				
6				
7				
8				
9				
10				

DESCRIPTION OF HAZARDOUS WASTES

PA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you ndle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number*(s)* from 40 CFR, Subpart C that describes the characteris-s and/or the toxic contaminants of those hazardous wastes.

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

NIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate odes are:

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

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

ROCESSES

PROCESS CODES:

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

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

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

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

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

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

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

	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

EPA I.D. NUMBER (from page 1)

1	S	V	D	0	0	8	2	9	0	3	3	0	1

FOR OFFICIAL USE ONLY

W	DUP	2	DUP

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F 0 0 1	25	P	S 0 1	
2	F 0 0 3	25	P	S 0 1	
3	F 0 0 5	25	P	S 0 1	
4	D 0 0 7	900	T	D 8 0	
5	D 0 0 7	3,000	T	D 8 3	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA I.D. NO. *(enter from page 1)*

N	V	D	0	0	8	2	9	0	3	3	0	T/A	6

FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

PHOTOGRAPHS

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

FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
36 02 30	115 00 00

FACILITY OWNER

A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
	C G		

OWNER CERTIFICATION

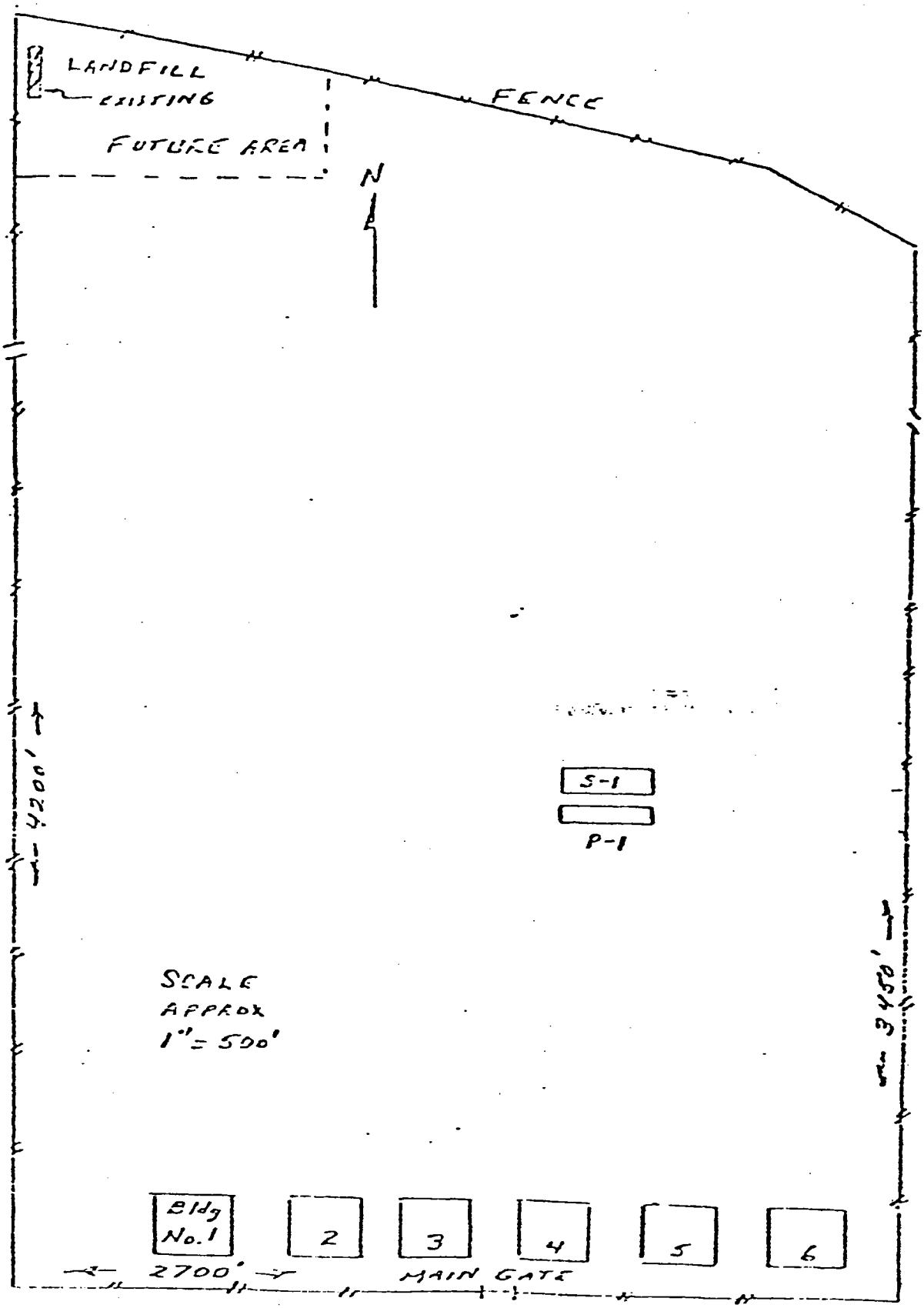
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
J. R. Kelley, Vice President Electrolytic Division	J R Kelley	7-12-82

OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED


LANDFILL
EXISTING
FUTURE AREA
FENCE
N
S-1
P-1
4200'
3450'
SCALE
APPROX
1" = 500'
Bldg No. 1
2
3
4
5
6
2700'
MAIN GATE

Kerr-McGee Pond Sampling Program

By

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

May, 1982

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<

DESERT RESEARCH ITUTE FILE NAME: 5608KG.TBL

LAB # / DATE	SAMPLE POINT	CR MG/L	AS MG/L	BA MG/L	CD MG/L	PB MG/L	HG MG/
5608 8-MAR-83	POND SOLID SAMP. A	2.5	<.04	<.5	.74	<.5	<.0
5608 8-MAR-83	POND SOLID SAMP. B	2.4	<.04	<.5	<.05	<.5	<.0

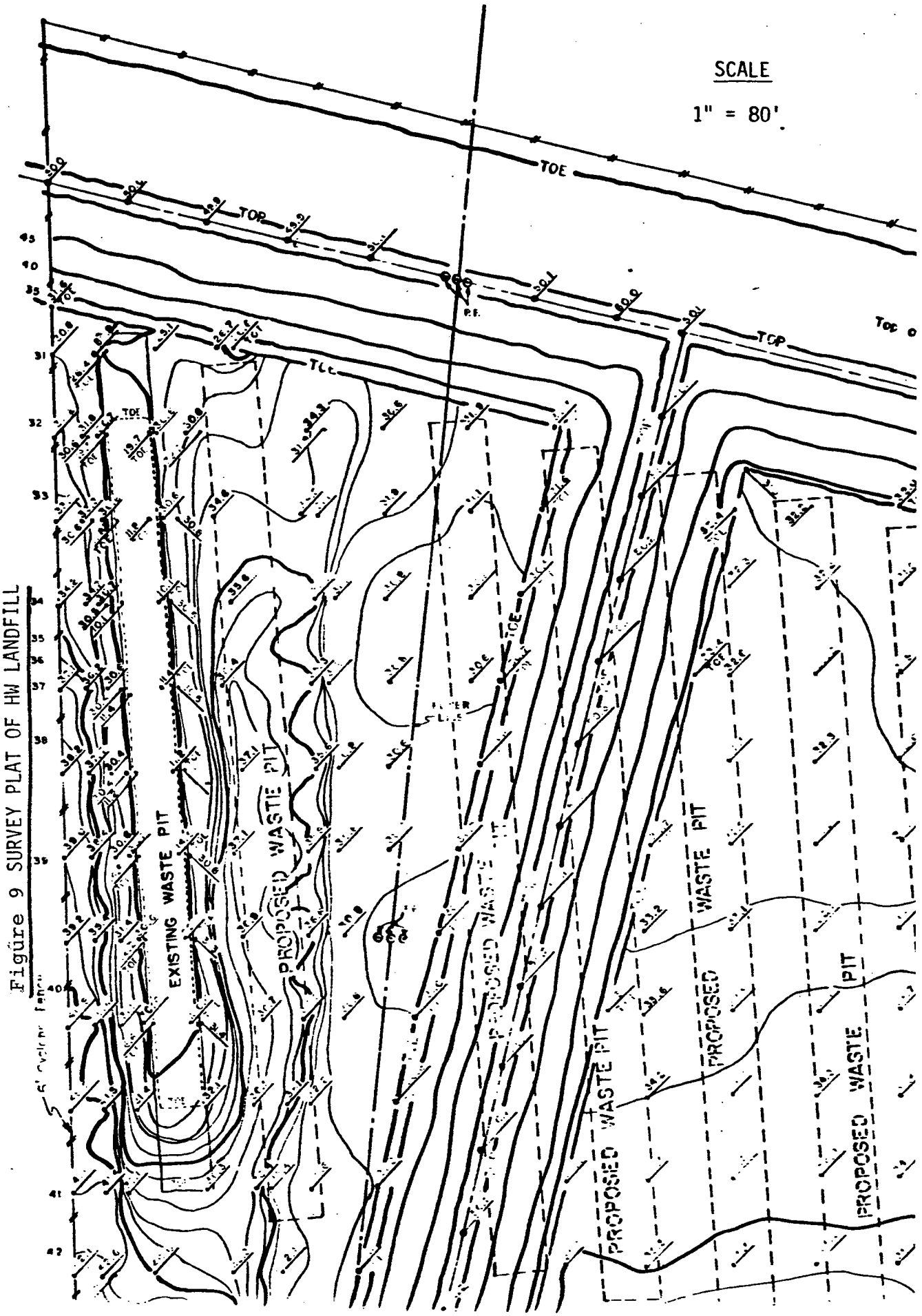


Figure 9 SURVEY PLAT OF HW LANDFILL

APPENDIX III

1	Analytical Data of S-1 Soil	48
2	Analytical Data on Surface Samples	53

APPENDIX III

ANALYTICAL DATA ON S-1 BOTTOM SOIL

The following information was reported in the closure plan for pond S-1 and is germane to the landfill closure because soil from below S-1 was disposed of in the landfill and constitutes the upper several feet of the cell.

To demonstrate that all hazardous constituents were removed from S-1 pond area, the following sampling and analyses were conducted:

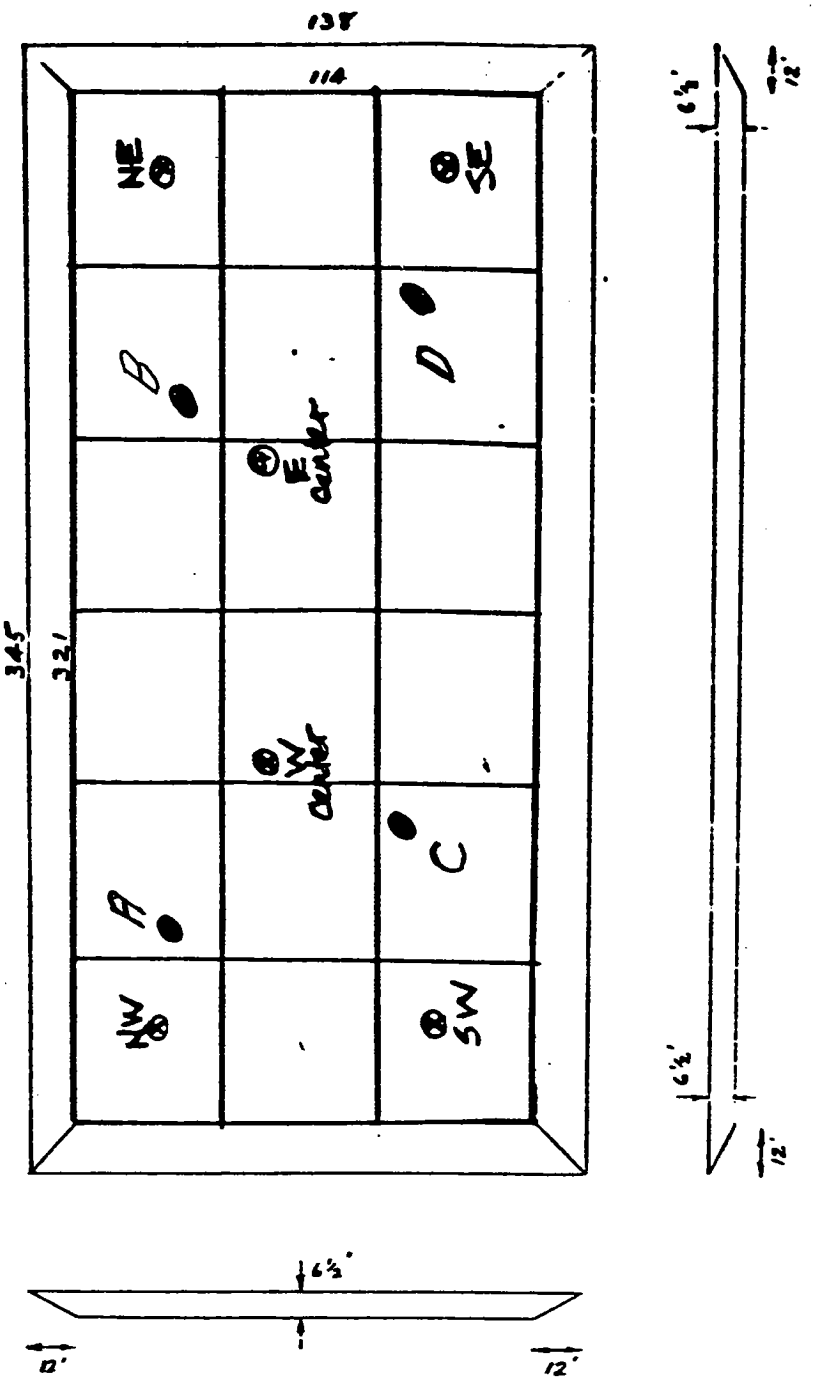
i) Six soil corings (to a depth of 4') were taken from the pondsite area at locations shown in attachments (NW, SW, W center, E center, NE, SE).

ii) To establish background, three soil corings (to a depth of 3') were taken from unaffected areas.

iii) A composite sample of each coring, made up of equal portions from each foot, was subjected to an EP toxicity test. The leachate was analyzed for total chromium.

iv) Additional samples at locations A, B, C, and D (to a depth of 6') were taken with separate analyses of each one-foot increment.

As the analyses indicate, the soil is nonhazardous, as the chromium value is below 5 ppm for every sample taken.



Analyses Attached

EVAPORATION POND S-1

Pond S-1

WATER ANALYSIS LABORATORY — REPORT DATE: 20-SEP-84
DESERT RESEARCH INSTITUTE — FILE NAME: 7714KM.TBL

LAB # / DATE	SAMPLE POINT	CR MG/L
7714	EP-TOX S1	
2-MAR-84	NW CORNER	0.05
7715	EP-TOX S2	
2-MAR-84	SW CORNER	<.02
7716	EP-TOX S3	
2-MAR-84	W CENTER	<.02
7717	EP-TOX S4	
2-MAR-84	E CENTER	0.11
7718	EP-TOX S5	
2-MAR-84	NE CORNER	0.02
7719	EP-TOX S6	
2-MAR-84	SE CORNER	<.02
7720	EP-TOX M1	
2-MAR-84	BACKGROUND	<.02
7721	EP-TOX M2	
2-MAR-84	BACKGROUND	<.02
7722	EP-TOX M4	
2-MAR-84	BACKGROUND	<.02

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

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

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

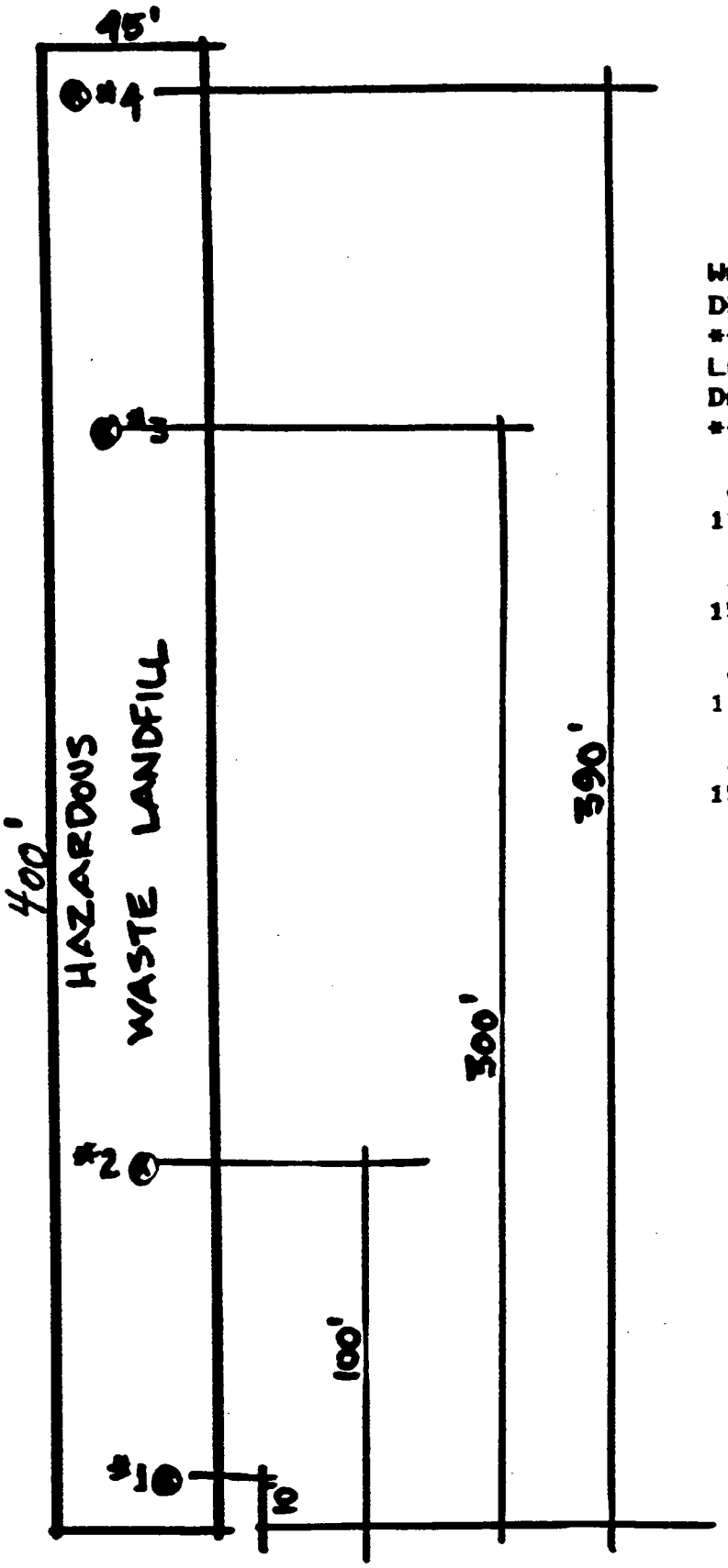
WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

LAB # / DATE	SAMPLE POINT	CR EPTOX
8716 24-AUG-84	C-4	<.02
8717 24-AUG-84	C-5	<.02
8718 24-AUG-84	C-6	<.02
8719 24-AUG-84	D-1	.02
8720 24-AUG-84	D-2	<.02
8721 24-AUG-84	D-3	<.02
8722 24-AUG-84	D-4	<.02
8723 24-AUG-84	D-5	<.02
8724 24-AUG-84	D-6	<.02

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

KMCC HAZARDOUS WASTE LANDFILL SURFACE ANALYSIS



"EP TOXICITY"
ANALYTICAL RESULTS

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

LAB # / DATE	SAMPLE POINT	CR MG/L
8187	EP-TOX #1	
15-MAY-84	SUR. 10' N	1.2
8188	EP-TOX #2	
15-MAY-84	SUR. 100' N	0.23
8189	EP-TOX #3	
15-MAY-84	SUR. 300' N	1.8
8190	EP-TOX #4	
15-MAY-84	SUR. 390' N	0.06

APPENDIX IV

1. Engineering design and specifications for the final grade, length and slope of the cover 55

2. Calculation of "Erodibility" and Supporting Soils Information 56

2. CALCULATION OF "ERODIBILITY" AND SUPPORT SOILS INFORMATION

The Universal Soil Loss Equation (USLE) was used to calculate the erodibility of the top layer (See Plate A-1). Native onsite soils were used with two cases being studied.

Average Case - Slope and length across the waste cell cap - 4 % slope for 55 feet.

$$A = RK(LS)CP = \text{Soil Loss}$$

where:

R = 22 for Henderson (obtained from the U.S. Soil Conservation Service)

K = 0.02 Ton/Acre (obtained by using the soil erodibility nomograph (See Plate A-3)).

The grain size distribution was determined using ASTM D-136, and the permeability was determined to be 3.6×10^{-3} cm/sec by use of the constant head method for determining saturated hydraulic conductivity. ✓

LS = 0.32 for 4% slope for 55' (See Plate A-4)

C = 1 for unvegetated fround (obtained from the U.S. Soil Conservation Service)

P = 1 (obtained from the U.S. Soil Conservation Service)

A = 22 x .02 Tons/Acre x 0.32 x 1 x 1 = 0.14 Tons/Acre. ✓

This soil loss falls well within RCRA's guidelines of not exceeding 2 Tons/Acre.

The Universal Soil Loss Prediction Equation

The Universal Soil Loss Prediction Equation can be used to:

1. Predict soil loss from sheet and rill erosion.
2. Determine resource management systems.
3. Evaluate the effectiveness of various conservation practices.
4. Determine horizontal spacing for terraces and diversions.

The soil loss equation is A = RKLSCP.

A - Soil Loss Per Acre Per Year

The soil loss is usually expressed as average annual soil loss in tons per acre. Determinations can be made also for only a certain portion of a year. Soil loss for a certain portion of the year is signified by Ax.

R - Rainfall Factor

The rainfall factor is the number of erosion-index units in a normal year's rain or a portion of a normal year's rain. The erosion-index is a measure of the eroisive force of specific rainfall. It is a product value of two rainstorm characteristics: total kinetic energy of the storm times its maximum 30-minute intensity (EI). The erosion potential of rainfall is highest where the rainfall energy and intensity are greatest. In Alabama, the values are highest in the southern part of the state and lowest in the northeastern part.

K - Soil-Erodibility Factor

The soil-erodibility factor is the erosion rate per unit of erosion index for a specific soil in cultivated continuous fallow, on a 9 percent slope, 72.6 feet long. Soil-erodibility values are experimentally determined for different soils.

L - Slope Length

Slope length is defined as the distance from the point of origin of overland flow to either of the following: 1) the point where the slope decreases to the extend that deposition occurs, 2) the point where runoff enters a well-defined natural channel or waterway, or 3) the point where runoff enters a terrace or diversion channel. It is usually not the total length of the field.

S - Percent Slope

Upward or downward slant or inclination. The degree or extent of deviation from the horizontal or perpendicular.

C - Cropping Management Factor

This factor takes into consideration the combined effects of different crops, management of crop residues, fertility level, and methods and time of tillage. It is influenced by the distribution of erosive rainstorms and periods of plant growth during the year. The cropping-management factor is the expected ratio of soil loss from land cropped under specified conditions in comparison to soil loss from fallow conditions on which the "K" factor is evaluated. The computation of this factor is rather complex.

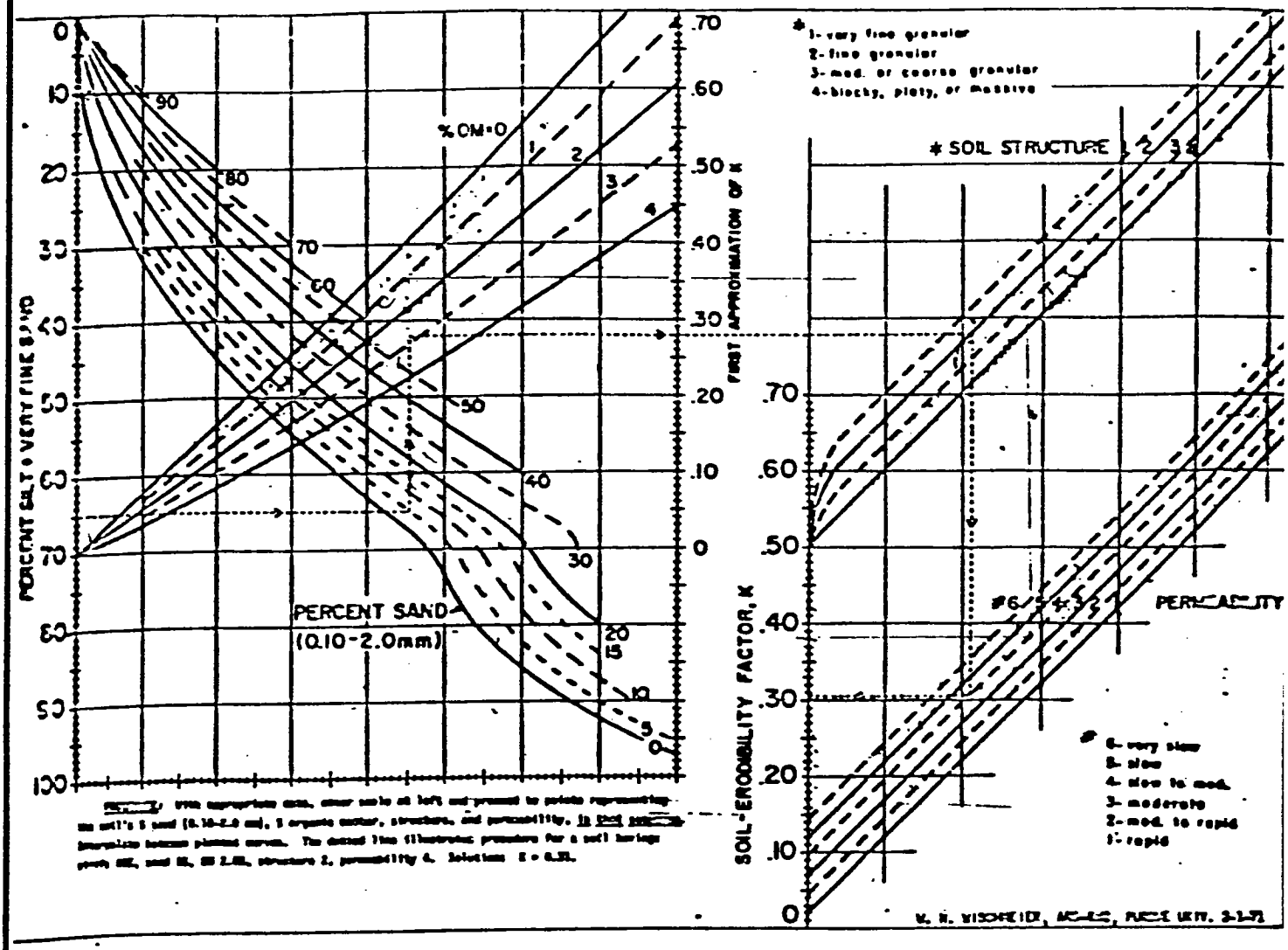
P - Erosion Control Practic Factor

This factor is the ratio of soil loss with contouring or stripcropping to that with up-and-down hill operation. The effects of terraces and diversions are taken into consideration in (L) slope length. The value of other conservation practices are built into the "C" cropping-management factor.

T - Soil Loss Tolerance

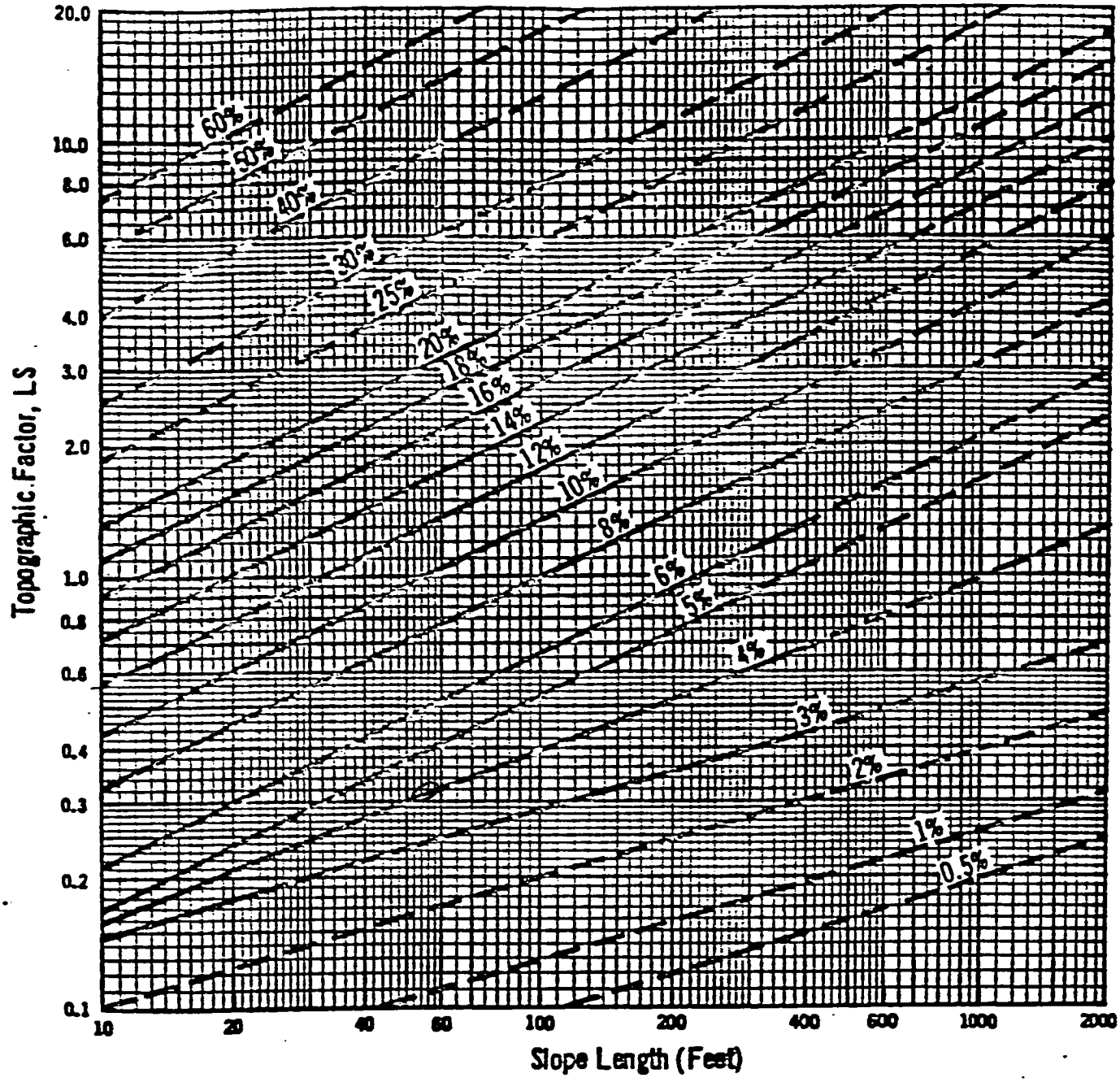
Soil loss tolerance is the estimated maximum average annual soil loss that can be tolerated and still permit a high level of crop productivity to be sustained economically and indefinitely. The establishment of tolerances for specific soils is largely a matter of collective judgement.

SOIL ERODIBILITY NOMOGRAPH



Reprinted from the Journal of Soil and Water Conservation
September-October 1971, Volume 26, Number 5

SLOPE EFFECT CHART (Topographic Factor, S)*



*The dashed lines represent estimates for slope dimensions beyond the range of lengths and steepnesses for which data are available. The curves were derived by the formula:

$$LS = \left(\frac{\lambda}{72.6}\right)^{m} \left(\frac{430x^2 + 30x + 0.43}{6.57415}\right)$$

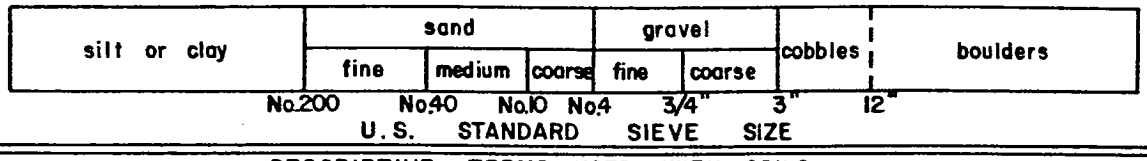
where λ = field slope length in feet and m = 0.5 if s = 5% or greater, 0.4 if s = 4%, and 0.3 if s = 3% or less; and $x = \sin\theta$. θ is the angle of slope in degrees.

J.H. KLEINFELDER & ASSOCIATES GEOTECHNICAL CONSULTANTS • MATERIALS TESTING	Kerr McGee Waste Cell Cap	PLATE A-4
PROJECT NO. L-1359-2		

MAJOR DIVISIONS			Group Symbols	TYPICAL NAMES
COARSE GRAINED SOILS — More than 50% of material is Larger than the No. 200 sieve.	GRAVELS — More than 50% of coarse part is larger than the No.4 sieve	CLEAN GRAVELS — Little or no fines	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES — Appreciable amt of fines	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS — More than 50% of coarse part is smaller than the No.4 sieve	CLEAN SANDS — Little or no fines	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES — Appreciable amt of fines	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS — More than 50% of material is smaller than No. 200 sieve.	SILTS AND CLAYS — Liquid limit LESS than 50		ML	Inorganic silts & very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to med. plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — Liquid limit GREATER than 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS



DESCRIPTIVE TERMS USED WITH SOILS			
CONSISTENCY			MOISTURE CONTENT
	Silts and Clays	Sands and Gravels	
Strongest ↑	very stiff	very dense	Wettest ↑ wet
	stiff	dense	very moist
	firm	medium dense	moist
Weakest	soft	loose	slightly moist
			Driest dry

DESCRIPTIVE TERMS USED WITH CALICHE AND CEMENTED SOILS			
	CALICHE	CEMENTED SAND AND GRAVEL	IDENTIFICATION TEST USING KNIFE AND STANDARD GEOLOGIST'S HAMMER
Strongest ↑	very hard	very hard	Difficult to scratch or break.
	hard	hard	Scratches leave only dust, requires many hammer blows to break.
	moderately hard	moderately hard	Can be readily cut with knife and crumbles with several hammer blows.
Weakest	partially cemented	partially cemented	Gouges easily with knife and crumbles readily with a few blows of a hammer.

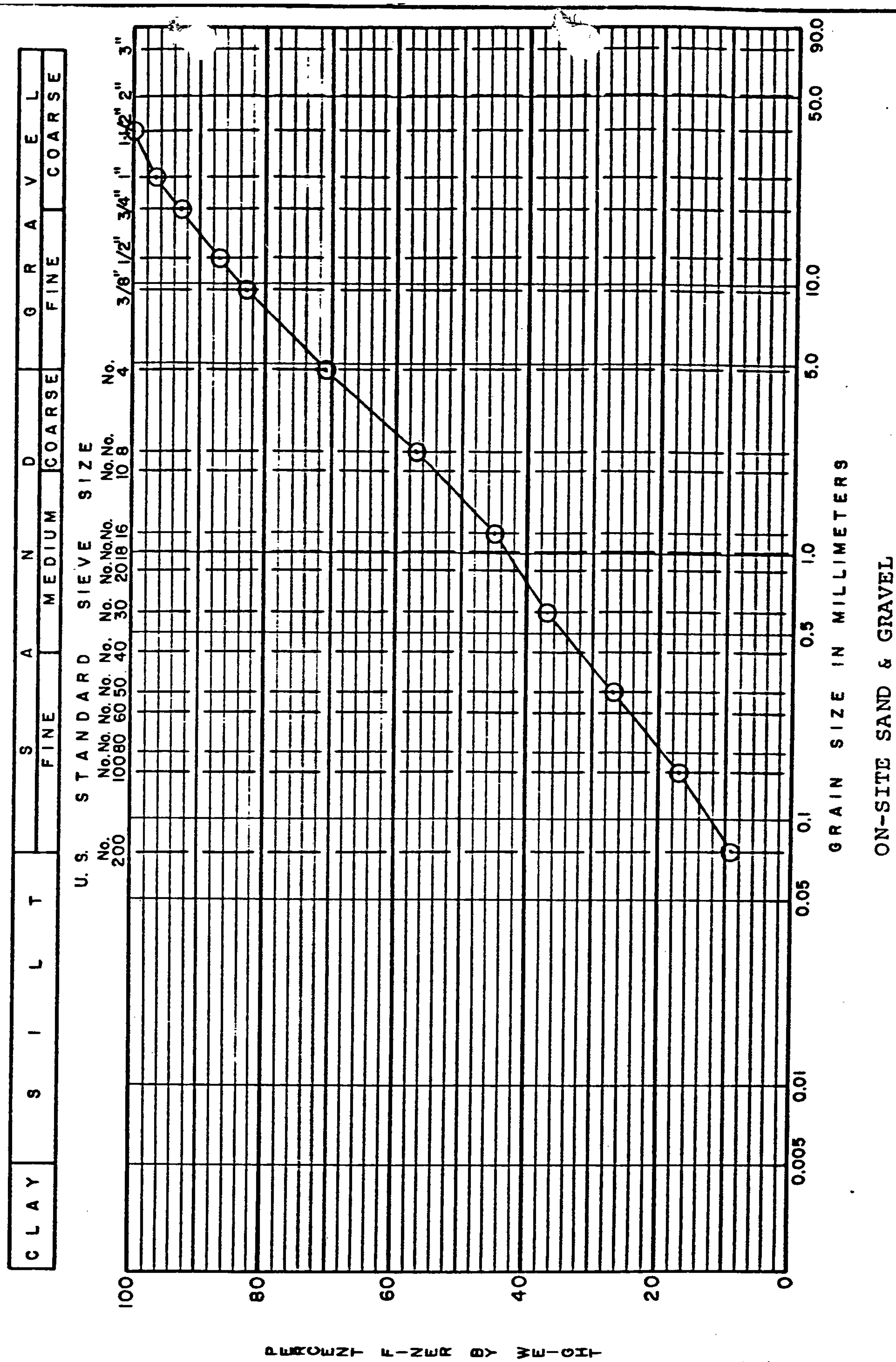
J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO.

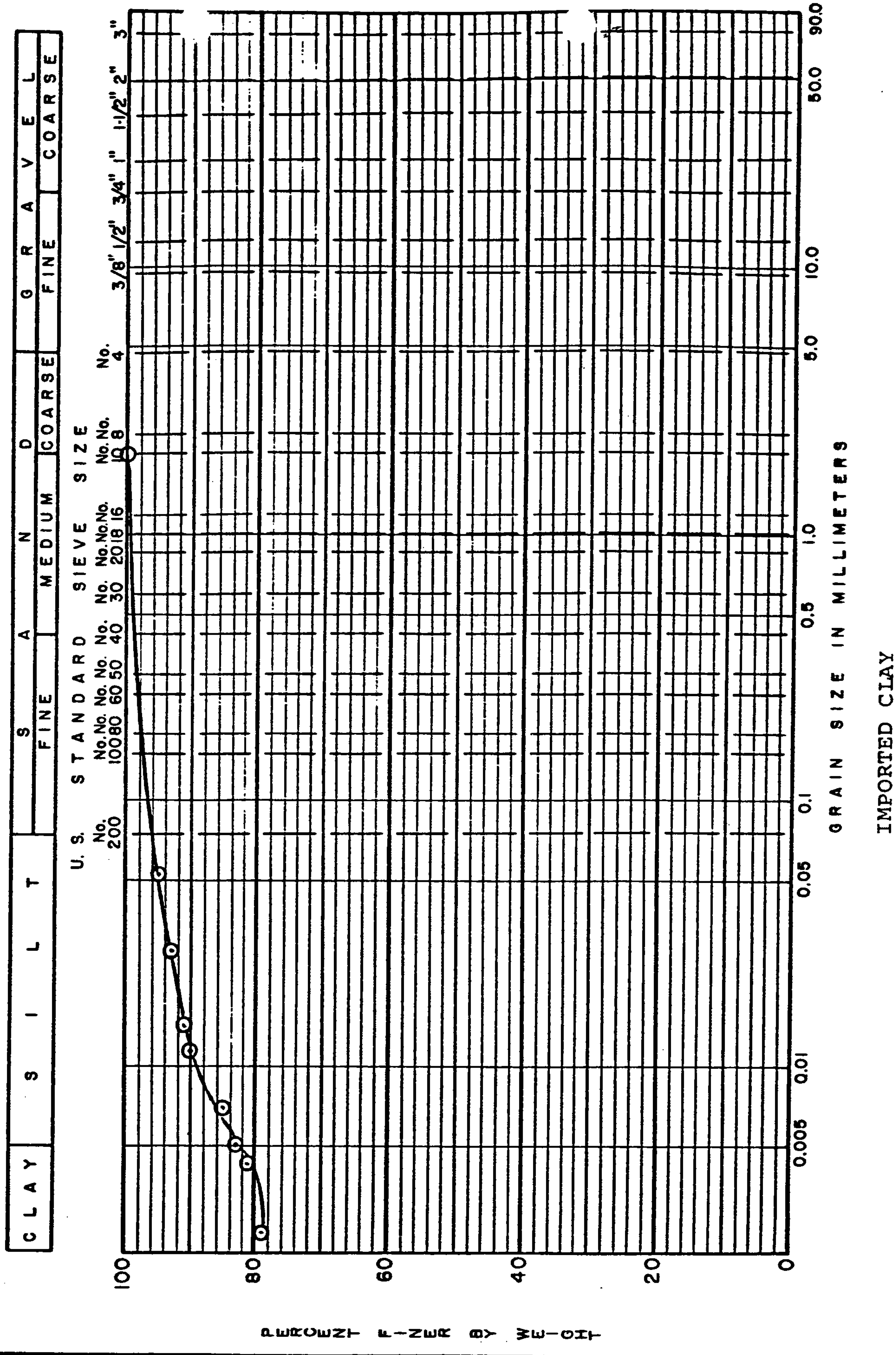
EXPLANATION OF MATERIAL CLASSIFICATIONS

PLATE B

JHK20



J.H. KLEINFELDER & ASSOCIATES GEOTECHNICAL CONSULTANTS • MATERIALS TESTING	GRAIN-SIZE DISTRIBUTION	PLATE 1
PROJECT NO. L-1359-2		



J.H. KLEINFELDER & ASSOCIATES

GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. L-1359-2

GRAIN-SIZE DISTRIBUTION

PLATE

2

CODE NUMBER	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (% of dry wt.)
1	GRAVELLY SAND - brown	121	10.5
2	CLAY - green	92	28.8

NOTES:

(1) Tests were performed in accordance with ASTM D1557-78 test method.

*(2) Tests with an asterisk are check point results utilizing zero-air-void curves.

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

COMPACTION TEST RESULTS

PLATE 3

PROJECT NO. L-1359-2

HK1

APPENDIX V

1. FINANCIAL ASSURANCE DOCUMENTS 66

2. LIABILITY INSURANCE CERTIFICATES 74

June 1, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

UPDATED FILING

Director
State of Nevada
Department of Conservation and Natural Resources
Capitol Complex
201 South Fall Street
Carson City, Nevada 89710

Dear Director:

I am the chief financial officer of Kerr-McGee Corporation of Kerr-McGee Center, Oklahoma City, OK 73125. This letter is in support of this firm's use of the financial test to demonstrate financial assurance as specified in the Nevada Administrative Code (NAC) No. 444.9055.

1. This firm is the owner or operator of the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in NAC No. 444-9070. The current closure and/or post-closure cost estimates covered by the test are shown for each facility: NONE.

2. This firm guarantees, through the corporate guarantee specified in NAC No. 444-9070, the closure or post-closure care of the following facilities owned or operated by subsidiaries of this firm. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility:

EPA Identification No., Name & Address	Cost Estimates	
	Closure	Post-Closure
NVD 008290330 Kerr-McGee Chemical Corporation P.O. Box 53 Henderson, NV 89015 Region IX	$128,000	$300,000

3. In states where the State of Nevada Department of Conservation and Natural Resources (Department) is not administering the financial requirements of NAC No. 444-9055, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in NAC No. 444-9070. The current closure and/or post-closure cost estimates covered by such a test or guarantee are shown for each facility:

EPA Identification No., Name & Address	Cost Estimates Closure	Post-Closure
MSD 990866329 Kerr-McGee Chemical Corporation 607 14th Street, North Columbus, MS 39701	$ 428,000	N/A
MSD 081387730 Kerr-McGee Chemical Corporation Highway 11 South P.O. Box 789 Meridian, MS 39301	$ 91,000	$113,000
OKD 000396549 Kerr-McGee Refining Corportion P.O. Box 305 Wynnewood, OK 73098	$ 211,000	$ 95,000
ALD 071937890 Kerr-McGee Chemical Corporation Mobile Facility P.O. Box 629 Theodore, AL 36590	$1,150,000	$253,000
MOD 007128978 Kerr-McGee Chemical Corporation Forest Products Division P.O. Box 6208 2300 Oakland Kansas City, MO 64126	$ 103,000	N/A
TXD 057111403 Kerr-McGee Chemical Corporation 155 Buchanan Rd. Texarkana, TX 75501	$ 708,000	N/A
TXD 000807859 Southwestern Refining Company, Inc. (Landfarm) P.O. Box 9217 Corpus Christi, TX 78408	$ 34,000	$408,000
ILD 020367561 Kerr-McGee Chemical Corporation P.O. Box 166 Madison, IL 62060	$1,665,000	N/A

4. This firm is the owner or operator of the following hazardous waste management facilities for which financial assurance for closure or, if disposal facility, post-closure care, is not demonstrated either to Department or a State through the financial test or any other financial assurance mechanism specified in NAC No. 444-9055 or equivalent or

substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE.

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

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

(SEE PAGE 4)

ALTERNATIVE I
(THOUSANDS OF DOLLARS)

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates shown in the four paragraphs above)	$ 5,6
*2.	Total liabilities (if any portion of the closure or post-closure is included in total liabilities, you may deduct the amount of that portion from this line and add that amount to lines 3 and 4.)	$2,074,1
*3.	Tangible net worth	$1,700,1
*4.	Net Worth	$1,732,8
*5.	Current assets	$ 929,1
*6	Current liabilities	$ 713,1
7.	Net working capital (line 5 - line 6)	$ 216,0
*8.	The sum of net income plus depreciation, depletion and amortization	$ 401,0
9.	Total assets in U.S. (required only if less than 90% of firm's assets are located in the U.S.)	$3,001,3

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

I hereby certify that the wording of this letter is identical to the wording specified in NAC 444.9070, as such regulations were constituted on the date shown immediately below.

Marvin K. Hambrick
Title: Executive Vice President Finance

Date: June 1, 1984

UPDATED

CORPORATE GUARANTEE FOR CLOSURE OR POST-CLOSURE CARE

Guarantee made this 1st day of June, 1984 by Kerr-McGee Corporation, a business corporation organized under the laws of the State of Delaware, herein referred to as guarantor, to the State of Nevada Department of Conservation and Natural Resources (Department), obligee, on behalf of our subsidiary Kerr-McGee Chemical Corporation, of Kerr-McGee Center, Oklahoma City, Oklahoma 73125.

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in NAC 444.9055.

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

EPA Identification No., Name & Address	Cost Estimates	
	Closure	Post-Closure
NVD 008290330 Kerr-McGee Chemical Corporation P.O. Box 53 Henderson, NV 89015	$128,000	$300,000

3. "Closure plans" and "post-closure plans" as used below refer to the plans maintained as required by NAC 444.9030 and 444.9035 for the closure and post-closure care of facilities as identified above.

4. For value received from Kerr-McGee Chemical Corporation, guarantor guarantees to Department that in the event that Kerr-McGee Chemical Corporation fails to perform closure and post-closure care of the above facility in accordance with the closure or post-closure plans and other permit or interium status requirements whenever required to do so, the guarantor shall do so or establish a trust fund specified in NAC 444.9055 in the name of Kerr-McGee Chemical Corporation in the amount of the current closure or post-closure cost estimates as specified in NAC No. 444-9050.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the Director of the State of Nevada's Department of Conservation and Natural Resources (Director) and to Kerr-McGee Chemical Corporation that he intends to provide alternate financial assurance as specified in NAC No. 444-9055, in the name of Kerr-McGee Chemical Corporation. Within 120 days after the end of such fiscal year, the guarantor shall establish such financial assurance unless Kerr-McGee Chemical Corporation has done so.

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

7. Guarantor agrees that within 30 days after being notified by the Department Director of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor of closure, or post-closure care, he shall establish alternate financial assurance as specified in NAC 444.9055, in the name of Kerr-McGee Chemical Corporation unless Kerr-McGee Chemical Corporation has done so.

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

> amendment or modification of the closure or post-closure plan, amendment or modification of the permit, the extension or reduction of the time of performance of closure or post-closure or any other modification or alteration of an obligation of the owner or operator pursuant to NAC 444.9055.

9. Guarantor agrees to remain bound under this guarantee for so long as Kerr-McGee Chemical Corporation must comply with the applicable financial assurance requirements of NAC 444-9055 for the above-listed facility, except that guarantor may cancel this guarantee by sending notice by certified mail to the Department Director and to Kerr-McGee Chemical Corporation, such cancellation to become effective no earlier than 120 days after receipt of such notice by both Department and Kerr-McGee Chemical Corporation, as evidenced by the return receipts.

10. Guarantor agrees that if Kerr-McGee Chemical Corporation fails to provide alternate financial assurance as specified in NAC 444-9055, and obtain written approval of such assurance from the Department Director within 90 days after a notice of cancellation by the guarantor is received by the Department Director from guarantor, guarantor shall provide such alternate financial assurance in the name of Kerr-McGee Chemical Corporation.

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

I hereby certify that the wording of this guarantee is identical to the wording specified in the Nevada Administrative Code No. 444.9070 as such regulations were constituted on the date first above written.

Effective date: June 1, 1984

KERR-McGEE CORPORATION

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

_____
Signature of Witness

ARTHUR ANDERSEN & CO.

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

June 1, 1984

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

Dear Sirs:

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

At your request, we have read the letter dated June 1, 1984, from your chief financial officer to the State of Nevada Department of Conservation and Natural Resources to demonstrate assurance of closure and post-closure care required by EPA regulations. As further required by such regulations, we have compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited financial statements as of and for the year ended December 31, 1983, referred to above with the corresponding amounts in such financial statements. In connection with this procedure, no matters came to our attention which caused us to believe that the specified data should be adjusted.

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

Very truly yours,

Arthur Andersen & Co.

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

January 13, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Judith E. Ayers, Regional Administrator
U. S. Environmental Protection Agency
Region IX
315 Fremont Street
San Francisco, California 94105

Re: Kerr-McGee Chemical Corporation
EPA I.D. #NVD 008290330
Henderson, Nevada Location

Dear Ms. Ayers:

Attached is a Hazardous Waste Facility Certificate of Liability Insurance for Kerr-McGee Chemical Corporation. The certificate demonstrates evidence of the liability insurance specified in requirements 264.147 and 265.147 for non-sudden (gradual) occurrences.

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

Very truly yours,

Charlotte Hix
Insurance & Claims Department

CH/vrr

Attachment

cc: E.T. Still

HAZARDOUS WASTE FACILITY

CERTIFICATE OF LIABILITY INSURANCE

1. Harbor Insurance Company, the "Insurer", of Los Angeles, California, hereby certifies that it has issued liability insurance covering bodily injury and property damage to Kerr-McGee Chemical Corporation, (the "insured"), of Kerr-McGee Center, Oklahoma City, Oklahoma in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147.

The coverage applies at:

EPA I.D. #NVD 008290330
Kerr-McGee Chemical Corporation
Henderson Facility
Lake Mead Drive
(P. O. Box 55)
Henderson, Nevada 89015

for nonsudden accidental occurrences.

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

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

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

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

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the Insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.174(f).

(c) Whenever requested by a Regional Administrator of the U. S. Environmental Protection Agency (EPA)

the Insurer agrees to furnish to the Regional Administrator

a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator of the EPA Region in which the facility is located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator of the EPA Region in which the facility is located.

I hereby certify that the wording on this instrument is identical to the wording specified in 40 CFR 264.151(j),

as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Rodman A. Frates

Signature of Authorized Representative of Insurer

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

(This Certificate of Insurance neither affirmatively or negatively amends, extends or alters the coverage, limits, terms or conditions of the policies certificates.)

This certificate is executed by Northwestern National Insurance Company
731 North Jackson, Milwaukee, Wisconsin 53201

1. Name and address of party to whom this certificate is issued

Sonia Crow, Regional Administrator
U. S. Environmental Protection Agency
Region IX
315 Fremont Street
San Francisco, CA 94105

2. Name and address of Insured

Kerr-McGee Chemical Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

DESCRIPTION AND LOCATION OF OPERATIONS COVERED

See separate two page attachment for the:

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

Sudden

SPECIAL PROVISIONS:

POLICY NUMBER	KIND OF INSURANCE	EXPIRATION DATE	LIMITS OF LIABILITY
CLA 224377	Comprehensive General Liability	July 1, 1984	$1,000,000 Each Occurrence $2,000,000 Annual Aggregate

This is to certify that the above Insurance Policies are in force in this company as of the date of this certificate. In the event of any material change in or cancellation of the above insurance, we will give you 50 days prior written notice of such change or cancellation.

C. L. FRATES & CO., INC.
P.O. Box 13839 Okla. City, Okla. 73154

7-8-82
DATED

AUTHORIZED REPRESENTATIVE

HAZARDOUS WASTE FACILITY

CERTIFICATE OF LIABILITY INSURANCE

1. Northwestern National Insurance Company, the "Insurer", of Milwaukee, Wisconsin, hereby certifies that it has issued liability insurance covering bodily injury and property damage to Kerr-McGee Chemical Corporation , (the "insured"), of Kerr-McGee Center, Oklahoma City, Oklahoma in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at:

EPA I.D. # NVD 008290330
Kerr-McGee Chemical Corporation
Henderson Facility
Lake Mead Drive
(P. O. Box 55)
Henderson, Nevada 89015

for sudden accidental occurrences.

The limits of liability are

$1,000,000 each occurrence

$2,000,000 Annual Aggregate,

exclusive of legal defense costs. The coverage is provided under policy number CLA 224377 issued on July 1, 1981. The effective date of said policy is July 1, 1981.

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

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

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the Insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.174(f).

(c) Whenever requested by a Regional Administrator of the U.S. Environmental Agency (EPA) the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the Region in which the facility is located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator of the EPA in which the facility is located.

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j), as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Signature of Authorized Representative of Insurer

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

KERR-McGEE CHEMICAL CORPORATION

HENDERSON, NEVADA FACILITY

HAZARDOUS WASTE CLOSURE/POST-CLOSURE PLAN (SURFACE IMPOUNDMENT)

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 $ft.^2$ and an approximate total volume of 270,000 $ft.^3$. 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.

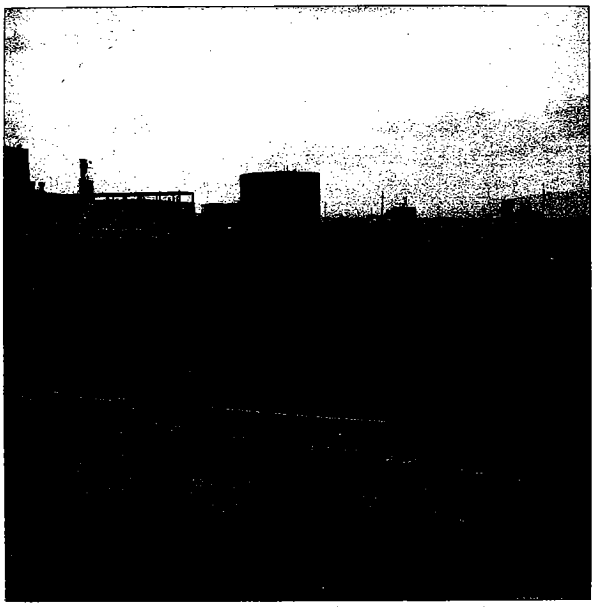
Therefore, KMCC concludes that cleanup has been completed to a level well below the criteria established by NDEP, and there is no contamination in the bottom of pond S-1 or affected areas.

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

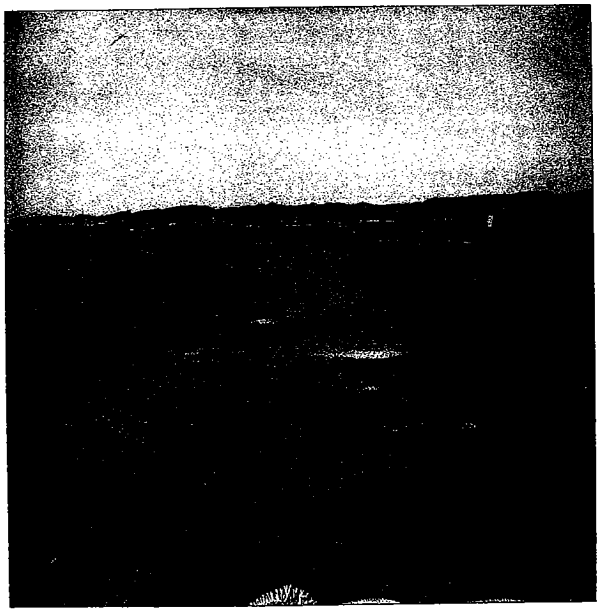
When production of potasssium perchlorate was terminated, all in-process product was finished and delivered to inventory for commercial sale. All process piping, pumps, and vessels were drained, and the liquors transferred to pond P-1. The entire operation (pipes, vessels, etc.) was flushed with copious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

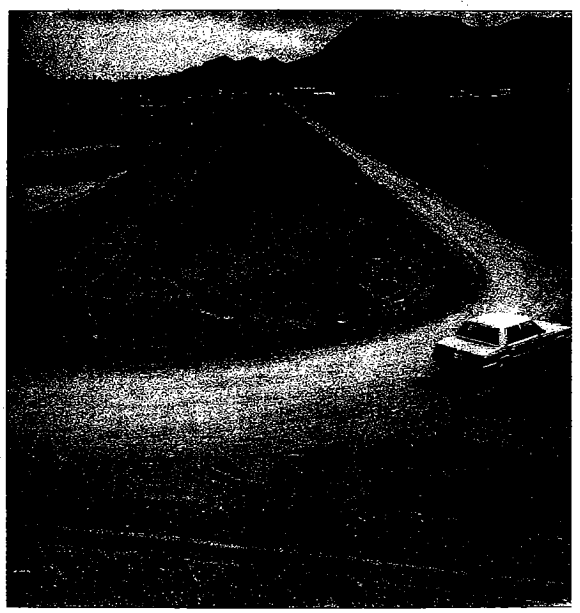
After decontamination, as described above, most of the equipment was put in service in other



KERR McGEE 9/89
CLOSED SURFACE IMPOUNDMENTS
looking west

KERR-McGEE 9/89
CLOSED SURFACE IMPOUND.
looking west





KERR McGEE 9/89

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 cleanup 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 $ft.^2$ and approximate volume of 125,000 $ft.^3$. 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	-	500*
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:

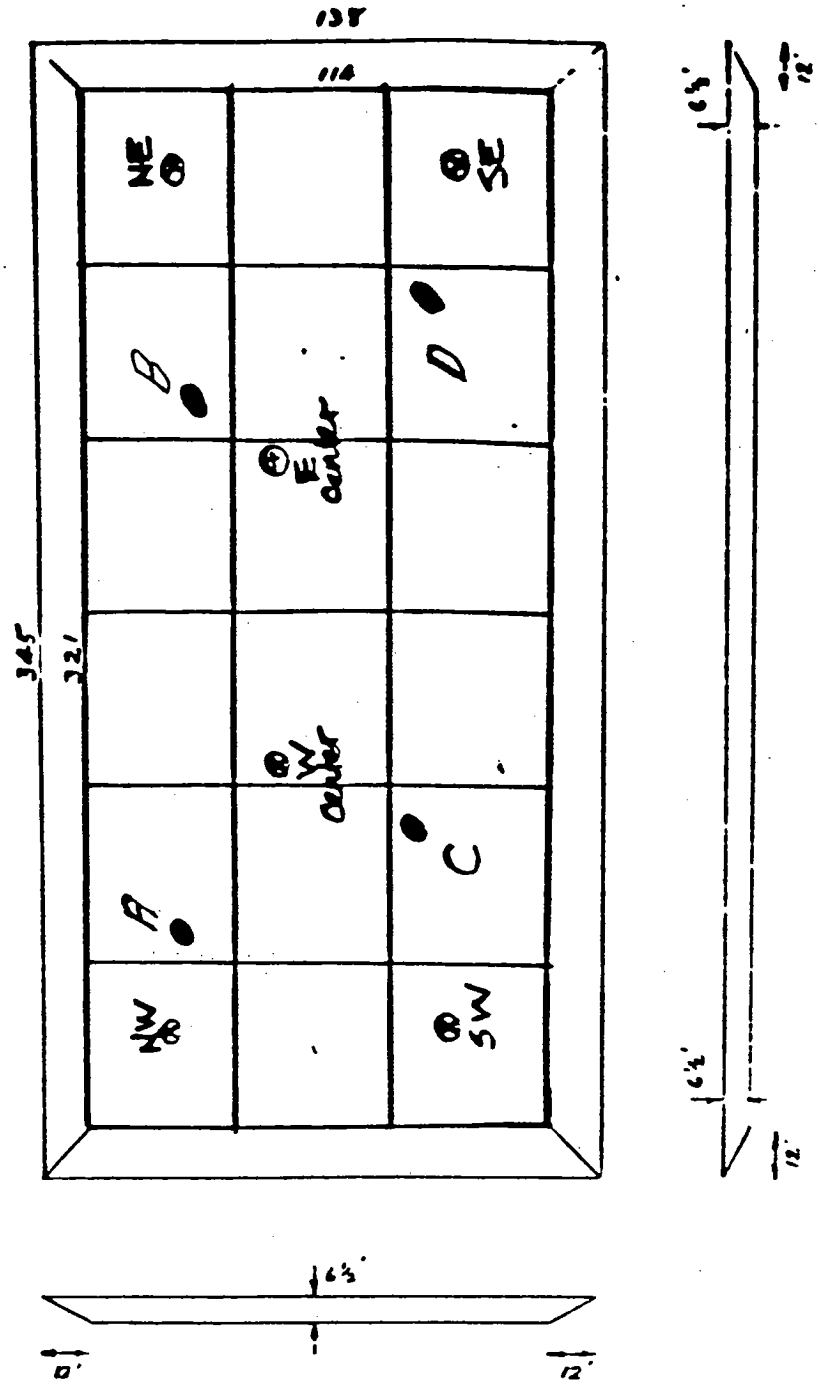
A. Installed two wells, M-11 and M-12, on the north side of Units 4 and 5, to pump contaminated water back to the process and recapture the chromium values.

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.



EVAPORATION POND S-1

Analyses Attached

Figure 1

Pond S-1

4CH "7
SEP

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

LAB # / DATE	SAMPLE POINT	CR MG/L
7714	EP-TOX S1	
8-SEP-84	NW CORNER	0.05
7715	EP-TOX S2	
8-SEP-84	SW CORNER	<.02
7716	EP-TOX S3	
8-SEP-84	W CENTER	<.02
7717	EP-TOX S4	
8-SEP-84	S CENTER	0.11
7718	EP-TOX S5	
8-SEP-84	NE CORNER	0.02
7719	EP-TOX S6	
8-SEP-84	SE CORNER	<.02
7720	EP-TOX M1	
8-SEP-84	BACKGROUND	<.02
7721	EP-TOX M2	
8-SEP-84	BACKGROUND	<.02
7722	EP TOX M4	
8-SEP-84	BACKGROUND	<.02

Table I

SLP 17 86

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

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

RESULTS ON EPA-TOX EXTRACTS REPORTED IN MG/L.

Table I (continued)

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

LAB # / DATE	SAMPLE POINT	CR EPTOX
8716 24-AUG-84	D-4	<.02
8717 24-AUG-84	D-5	<.02
8718 24-AUG-84	D-6	<.02
8719 24-AUG-84	D-1	.02
8720 24-AUG-84	D-2	<.02
8721 24-AUG-84	D-3	<.02
8722 24-AUG-84	D-4	<.02
8723 24-AUG-84	D-5	<.02
8724 24-AUG-84	D-6	<.02

RESULTS IN PPM(MG/L) EXCEPT AS REPORTED IN MG/L

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

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

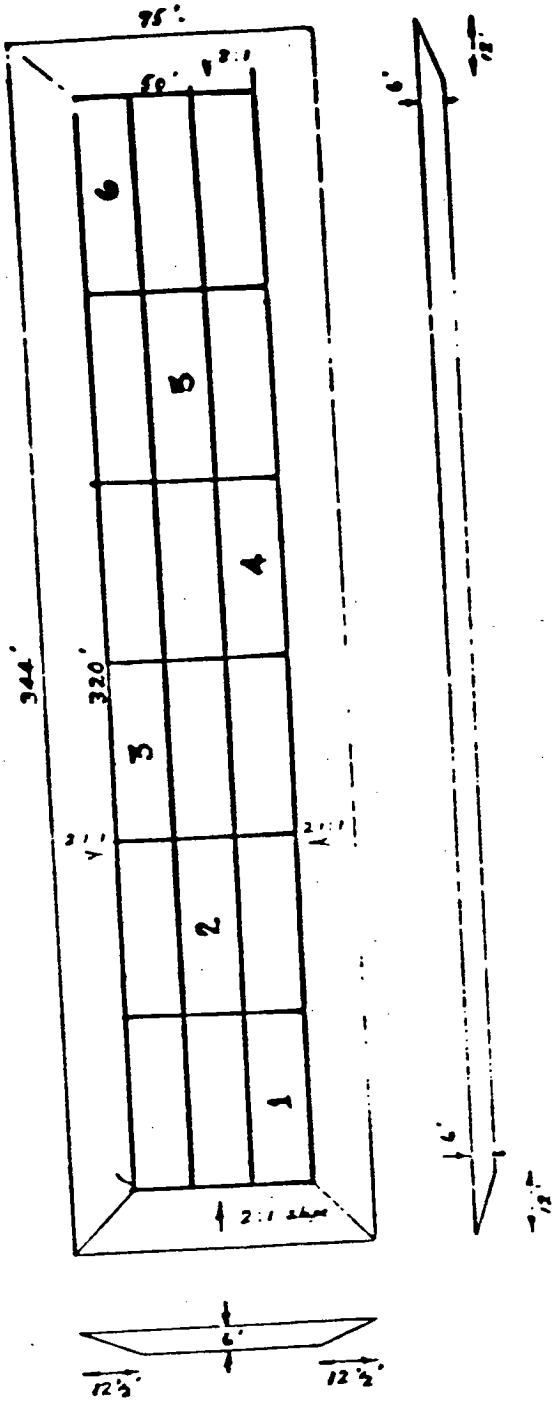
POND P-1 ANALYSIS

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

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

LAB #	PB MG/L	SE 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

Kerr-McGee Chemical Corporation
Henderson, NV
(EPA ID# NVD008290330)

Deficiencies and Required Improvements to Closure/Post-Closure Plans and Cost Estimates

This attachment identifies the deficiencies of the closure and post-closure plans and cost estimates for the hazardous waste management facility at Kerr-McGee's Henderson, Nevada plant. Attachment I indicates the revisions that Kerr-McGee must make to bring the facility into compliance with RCRA's Interim Status closure, post-closure and cost estimate standards (40 CFR 265 Subpart G and 265.142(a) and 265.144(a)).

CLOSURE PLAN

The June 9, 1983 closure plan referred only to pond P-1. No closure plan was submitted for the other pond(s) or the storage area. For the purposes of this review, EPA assumed that all ponds will contain hazardous wastes after closure.

I. MAXIMUM INVENTORY

Deficiency: The estimated inventory of hazardous waste in storage and treatment does not include all hazardous wastes at the facility at any time during the life of the facility (40 CFR 265.112(a)(2)).

Required Improvement: The closure plan must clearly indicate the maximum amount of hazardous waste that can reasonably expected to be on-site in storage and treatment at any time. In developing this estimate, consider all sources of hazardous waste at the site, including:

- Maximum amount of hazardous material ever stored or treated in the ponds;
- Hazardous wastes in containers;
- Any contaminated soil from areas surrounding the ponds; from near the container storage area; locations from near the landfill that will not be covered by a cap; from near hazardous raw material storage tanks; as well as from stormwater ditches;
- Decontamination residues from cleaning waste management system lines and pumps; the container storage area; hazardous raw material storage tanks and related containment systems and sumps; process vessels, recycling equipment and sumps that were exposed to hazardous materials; as well as equipment used in managing the waste (e.g. portable pumps; tank trucks; etc.); and
- Any hazardous raw material inventories that will be discarded at closure.

II. PARTIAL CLOSURE

Deficiency: The closure plan does not describe in sufficient detail the steps necessary to close the facility (40 CFR 265.112(a)(1), 265.228(c) and 265.310).

Required Improvement: The closure plan must address the following issues with regard to closing the landfill:

o Decontamination of Surrounding Area

State how potential contamination will be assessed in areas near the landfill that will not be covered with a final cap (e.g. by visual inspection and/or sampling and analysis). Identify the parameters to be used to assess contamination; the number and general location of samples to be collected; as well as the test methods and criteria that will be used to make this determination. Describe the procedures for cleaning up any spilled hazardous material and contaminated soil near the landfill. State how decontamination of the surrounding area will be verified.

o Containment of Wastes*

Demonstrate that the final cover will achieve the following objectives:

- Control of pollutant migration from the facility via ground water, surface water and air;

- Control of surface infiltration;

- Prevention of erosion.

The demonstration must address the following factors:

1. Type and amount of hazardous waste and constituents in the landfill.

2. Mobility and rate of migration of the waste.

Note:* In addressing this requirement you may wish to refer to Closure of Hazardous Waste Surface Impoundments (SW-873) (EPA: 1980) and Evaluating Cover Systems for Solid and Hazardous Waste (SW-873)(EPA:1980).

3. Site location and topography with respect to the potential impact caused by pollutant migration (for example, proximity to population centers, ground water, surface water, drinking water sources, soil permeability, depth of water table, and geological and geochemical characteristics of surrounding soils).

4. Climate, including amount, frequency and pH of precipitation.

5. Cover material characteristics including: porosity and permeability of each layer; degree of compaction; erodability of the top layer; soil composition (e.g. texture); sources of materials; plasticity and strength of the cap for supporting loads (e.g. consistent with weight of equipment used for spreading; and loads applied to cap during post-closure use of the site).

The closure plan also must indicate the design of the cover, including the final surface contours. As a result, the closure plan must describe: types of drainage and run-on diversion structures to be used (e.g. earthen or pipe channels, berms, etc.) and their capacities; as well as the cap's slope; length of run of slope; and methods to control erosion (e.g. layer of vegetation, gravel, etc.) of the cap.

6. Construction of the final cover, including: equipment and procedures used for installing the PVC synthetic liner and for spreading, compacting and grading the cover material; precautions to prevent failure of the containment layers; inspections to ensure proper cover; and steps in the vegetation program or application of other cover material (e.g. gravel) for preventing erosion of the cap.

o Post-Closure Ground Water Monitoring

Describe Kerr-McGee's ground water monitoring program for the post-closure period and show how it will meet all the requirements of 40 CFR Part 265 Subpart F. The plan must include the continuance of this monitoring activity for 30 years. This requirement may be satisfied by submittal of an existing post-closure ground

water monitoring plan that meets the regulatory requirements. The plan must contain a description of Kerr-McGee's planned sample collection procedures (e.g. sampling equipment, locations in aquifer, etc.); sample preservation techniques; analytical procedures and chain of custody control. The plan must also indicate that ground water surface elevations will be recorded when sampling the wells.

- o Post-Closure Maintenance of Landfill Cover

  Describe the types of problems inspectors will look for during inspections of the closed landfill. Describe the types of disturbances to the cap, and drainage and diversion structures which will trigger repairs. Indicate the types and frequency of repairs which will be made to correct the effects of settling, subsidence, erosion, pooling, etc. Describe the types of preventive maintenance that will be performed and their frequencies in order to maintain the integrity of the cap and containment structures (e.g. regrading, removing woody plants, replanting and fertilizing cover vegetation, maintaining diversion and drainage structures, etc.).

- o Post-Closure Maintenance of Ground Water Monitoring Equipment

  Describe the types of problems inspectors will look for during inspections of ground water monitoring equipment as well as the types of problems that will trigger repairs or replacement of the wells, seals, pumps, caps, etc. Indicate the types of preventive maintenance that will be performed (and its frequency) to ensure that the ground water monitoring system fully conforms to the post-closure monitoring plan.

III. REMOVAL AND TREATMENT OF HAZARDOUS WASTE

Deficiency: The closure plan does not describe in sufficient detail the steps necessary to treat onsite and/or remove the hazardous wastes from the facility's ponds and container storage area at closure (40 CFR 265.112(a)).

Required Improvement: The closure plan must address the following issues.

- o Container Storage Area

  State clearly that all containers containing hazardous waste will be shipped at closure to an off-site facility with Interim Status or a RCRA permit to receive these wastes. Specify the ultimate fate (i.e. treatment or disposal) of these wastes.

- o Surface Impoundments

  Describe any procedures and equipment that will be used to promote evaporation (solar drying) of the pond contents to ensure removal of free liquids. Present calculations to show the time needed to complete evaporation of the waste. Specify the maximum evaporation rate that can be expected under ideal conditions (evaporation potential) at the site. Describe any methods (if used) to stabilize the sediment that remains after evaporation, including: type of bulking agent, amount required, and the equipment needed to stabilize the sediment. State the target residual moisture content of the waste sediment as well as the expected thickness of the sediment that will remain after evapora- tion is completed.

IV. DECONTAMINATION OF STRUCTURES AND EQUIPMENT

Deficiency: The closure plan does not describe in sufficient detail the steps necessary to decontaminate the facility (40 CFR 265.112(a)(3)).

Required Improvement: The closure plan must address the following issues.

- o Container Storage Area

  State how potential contamination in this area will be assessed (i.e. visual inspection and/or sampling and analysis). Identify the parameters to be used to assess contamination; the number

and general location of samples to be collected; as well as the test methods (if any) and criteria that will be used to make this determination. Describe the procedures for cleaning the containment area as well as removing any nearby contaminated soil. Indicate how decontamination will be verified as well as how to assess whether the decontamination solution and residues must be managed as hazardous wastes.

o Surface Impoundments

Describe the procedures for assessing whether any soil contamination has occurred outside of the areas that will be covered with a final cap. State the number and general location of samples to be collected. Identify the test methods, parameters and criteria to be used to assess contamination. Describe plans for visual inspections for seepage, spillage, etc. In addition, describe the procedures for excavating any contaminated soil and for verifying that decontamination has been effective.

Specify steps to decontaminate all lines and pumps associated with the ponds. State how decontamination will be verified and the procedure to assess whether the decontamination solution and residues must be managed as hazardous wastes.

o Other Equipment and Structures

Describe the procedures for decontaminating the following equipment and structures: hazardous raw material tanks and associated containment structures and sumps; the ditch(es) for stormwater runoff; process vessels and sumps exposed to hazardous chemicals; and equipment used for managing the hazardous wastes (e.g. portable pumps, tank trucks, shovels, etc.). Specify the procedures and criteria that will be used to verify decontamination and state how you will determine whether the decontamination rinsate must be managed as a hazardous waste.

Finally, state whether the contaminated soil, waste residues and decontamination rinsate will be disposed of onsite in the disposal surface impoundments or containerized and removed from the facility at closure. Specify that all hazardous material that is shipped off-site will be sent to a treatment or disposal facility with Interim Status or a RCRA permit to receive it.

V. CONTAINMENT OF WASTE DISPOSED ONSITE IN SURFACE IMPOUNDMENTS

Deficiency: The closure plan neither completely describes the characteristics of the disposal surface impoundment covers nor the necessary steps for installing them (40 CFR 265.228(c), 265.310 and 265.112(a)).

Required Improvement: The closure plan must be amended to include a comprehensive demonstration that the surface impoundment final covers will achieve the following objectives:

- o Control of pollutant migration from the facility via ground water, surface water or air;
- o Control of surface infiltration; and
- o Prevention of erosion.

Your demonstration must address the following factors:

1. Type and amount of hazardous waste and constituents in the surface impoundments.

2. Mobility and rate of migration of the waste.

3. Site location and topography with respect to the potential impact caused by pollutant migration (for example, proximity to population centers, ground water, surface water, drinking water sources, soil permeability, depth of water table and geological and geochemical characteristics of surrounding soils).

4. Climate, including amount, frequency and pH of precipitation;

5. Cover material characteristics including; porosity of compaction; total area to be covered; erodability of the topsoil layer; soil and clay layer compositions (e.g. texture); needed volumes of soil; sources of materials; and strength of the cap for supporting loads (e.g. consistent with weight of equipment used for spreading; and loads applied to the cap during post-closure use of the site).

The closure plan also must indicate the design of the cover, including the final surface contours. As a result, the closure plan should describe: types of drainage and run-on diversion structures to be used (e.g. earthen or pipe channels, berms, etc.) and their capacities; length of run of slope; and methods to control erosion (e.g. layer of vegetation, gravel, etc.) of the cap as well as the impoundment dikes.

6. Construction of the cover, including: equipment and procedures for installing the landfill cap as well as folding the plastic membranes back over the above grade ponds without tearing or puncturing; method of containing wastes in ponds that are belowgrade; construction of run-off control structures; equipment and procedures for applying the topsoil layer including necessary compaction and grading; inspections to ensure proper cover; and steps that ensure the control of erosion of caps and dikes.

VI. CERTIFICATION OF CLOSURE

Deficiency: The closure plan should state the number and timing of the inspections by Kerr-McGee and an independent registered professional engineer to verify that facility closure has proceeded according to the closure plan (40 CFR 265.112(a)(1) and 265.115).

Required Improvement: The closure plan should indicate the timing and number of inspections by Kerr-McGee and an independent professional registered engineer to verify proper closure.

P-1 per NHR per EMC 2/25/83 telecon w/EP Wilson

VII. CLOSURE SCHEDULE

Deficiency: The date on which final closure of the S-1 impoundment and the storage areas of the facility is not indicated in the closure plan. The plan also does not provide a schedule that allows tracking of intervening closure activities (40 CFR 265.112(a)(4)).

Required Improvement: The closure schedule contained in the plan must show the time required for intervening closure activities which will allow tracking of the progress of closure. For example, Kerr-McGee's closure schedule should include: removal of any hazardous waste inventory off-site; decontamination of facility equipment and structures; conduct of any activities to facilitate evaporation; grading of impoundment fill; preparing the soil cap; etc.

POST-CLOSURE PLAN

I. DURATION OF POST-CLOSURE CARE

Deficiency: The plan does not state that post-closure care will be provided for 30 years (40 CFR 265.117(a) and 265.118(a)).

Required Improvement: The plan must state that post-closure care will be provided for 30 years.

II. GROUND WATER MONITORING

Deficiency: The post-closure plan does not show how the planned ground water monitoring and any corrective actions will comply with Subpart F requirements (40 CFR 265.118(a)(1)).

Required Improvement: The plan must present the details of Kerr-McGee's post-closure ground water monitoring and correction program. Page 2 of Kerr-McGee's Post-Closure Plan (dated 1/21/83) refers to post-closure ground water monitoring near the landfill. However, neither this version of the plan nor the version dated 8/23/82 describes the ground water monitoring that will take place near the ponds. Moreover, it must be assumed that post-closure groundwater monitoring will be performed for 30 years.

This requirement may be addressed by reference to an existing ground water monitoring and correction plans for the facility that meet the regulatory requirements. The following items must be covered in the post-closure plan: sample collection frequency and procedures (e.g. sampling equipment, locations in aquifer, etc.); sample preservation techniques; sample shipment; analytical procedures; and chain of custody control. The plan must identify the parameters that will be tested for and indicate that ground water surface elevations will be recorded when ground water samples are collected. Finally, a complete description of planned corrective actions must be included.

III. MAINTENANCE ACTIVITIES

Deficiency: The post-closure plan does not contain a complete description of the planned maintenance activities and the frequencies at which they will be performed to ensure the integrity of the impoundment covers and other containment structures as well as the functioning of facility ground water monitoring and security equipment (40 CFR 265.118(a)(2)).

Required Improvement: The post-closure plan must address the following issues:

- o Cap, Containment and Diversion Structures

  Describe the types of problems which inspectors will look for during inspections as well as the types of disturbances to the cap, dikes and drainage and diversion structures that will trigger repairs. Indicate the types of repairs which will be made to correct the effects of settling, subsidence, erosion, pooling, dike instability, etc. Describe the types of preventive maintenance that will be performed and their frequencies in order to maintain the integrity of the cap and containment structures (e.g. regrading the cap, replacement of topsoil, removing woody plants, maintaining diversion and drainage structures, etc.).

- o Ground Water Monitoring Equipment

  Describe the types of problems which inspectors will look for during inspections of ground water monitoring and corrective action systems as well as the types of problems that will trigger repairs or replacement of the wells, seals, pumps, caps, etc. Indicate the types of preventive maintenance that will be performed (and the frequency) to ensure that the ground water monitoring and corrective action systems fully conform to the post-closure monitoring plan.

- o Facility Security

  Describe what inspectors will look for during inspections of the security equipment as well as the types of problems that will trigger repair or replacement of fences, signs, etc.

  In addition, describe any provisions for the protection and maintenance of surveyed benchmarks and for restricting access to the facility during the post-closure period.

IV. POST-CLOSURE CONTACT

Deficiency: The plan does not identify a contact person or office for the facility during the post-closure period (40 CFR 265.118(a)(3)).

Required Improvement: The plan must state the name, address and phone number of the person or office to contact about the facility during the post-closure care period.

V. POST-CLOSURE GOALS

Deficiency: The plan does not describe the extent to which the post-closure activities will ensure achievement of the post-closure waste containment objectives (40 CFR 265.228(c), 265.310(b) and (c), 265.112(a)(1)).

Required Improvement: The description of the post-closure activities must show how they will achieve the following goals:

- o Control of pollution migration via ground water, surface water and air;
- o Control of surface water infiltration including prevention of pooling; and
- o Prevention of erosion.

This discussion should include at least a narrative statement that the following factors were considered in addressing the post-closure objectives:

- o Type and amount of waste;
- o Mobility and rate of migration of the waste;
- o Site location, topography and surrounding land use;
- o Climate, including precipitation;
- o Characteristics of the cover, including material, final surface contour, thickness, porosity, permeability, slope, and vegetation;
- o Geological and soil profiles as well as surface and subsurface hydrology;
- o Type, concentration and depth of hazardous constituent migration as compared to background concentrations; and
- o Planned future use of the site.

COST ESTIMATES

I. CLOSURE COST ESTIMATES

Deficiency: The closure cost estimate does not include all relevant closure costs. In addition, the estimate should be updated to reflect inflation (40 CFR 265.142(a) and (b)).

Required Improvement: The closure cost estimate must be revised to include costs associated with the following items:

- o Labor and equipment used in evaporating the wastes from the impoundments;
- o Labor, equipment and materials used in containment of wastes in all surface impoundments that contain wastes (the current cost estimate covers only one such pond);

- o Shipping any containers of hazardous wastes offsite;
- o Labor, equipment and materials used in decontaminating facility equipment and structures;
- o Removing from the site or disposing on site of decontamination rinsate and any contaminated soil;
- o Certification by a registered professional engineer of the closure of surface impoundments and other areas at the facility (except for the landfill);
- o Ground water monitoring and corrective actions performed during the closure period.

Moreover, the closure cost estimate must be adjusted for inflation every year by using an inflation factor derived from the annual Implicit Price Deflator for Gross National Product as published by the U.S. Department of Commerce in its Survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflator by the Deflator for the previous year.

In addition, the closure cost estimate should itemize the unit costs. In this way, it is ensured that all the identified cost elements are included.

II. POST-CLOSURE COST ESTIMATE

Deficiency: The post-closure cost estimate does not cover all of the costs of providing post-closure care. In addition, the estimate has not been updated for inflation (40 CFR 265.144(a) and (b)).

Required Improvement: The post-closure cost estimate should present itemized expenses. It should be reviewed to ensure that it includes the cost of labor, materials, equipment, overhead, etc. for the following items:

- Administering the post-closure plan;
- Sampling ground water wells monitoring the landfill as well as the ponds and analyzing samples for 30 years;
- Performing corrective actions and related monitoring;
- Inspecting and maintaining ground water wells for the landfill and surface impoundments (including replacement) for 30 years as well as inspecting and maintaining the corrective action system;
- Inspecting and maintaining site security (e.g. replacing fences) for 30 years; and
- Inspecting and maintaining landfill and surface impoundment caps and dikes as well as drainage and diversion structures for 30 years.

Finally, the post-closure cost estimate must be revised annually to reflect inflation using the same method as for updating the closure cost estiamte (per 40 CFR 265.144(b)).