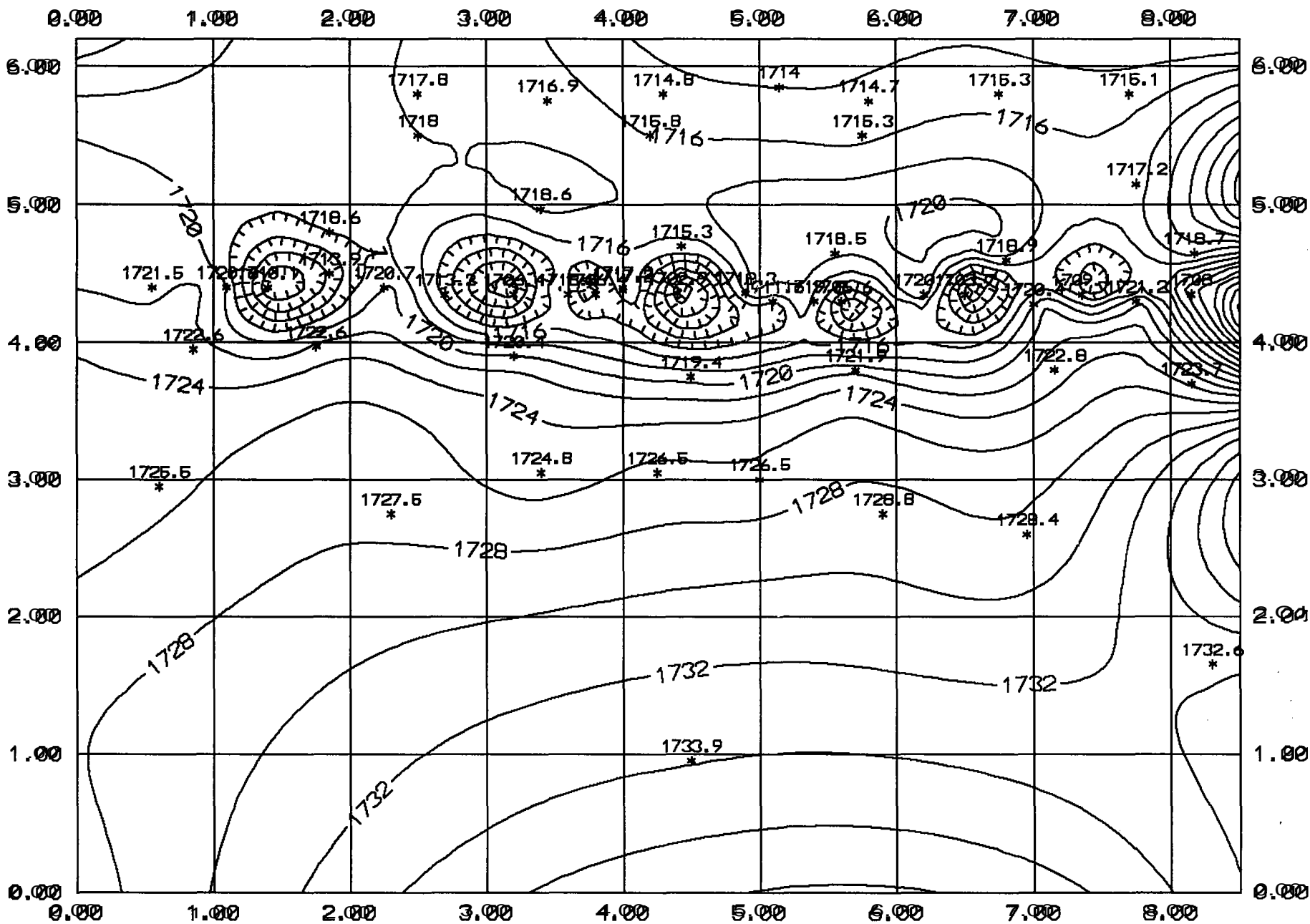
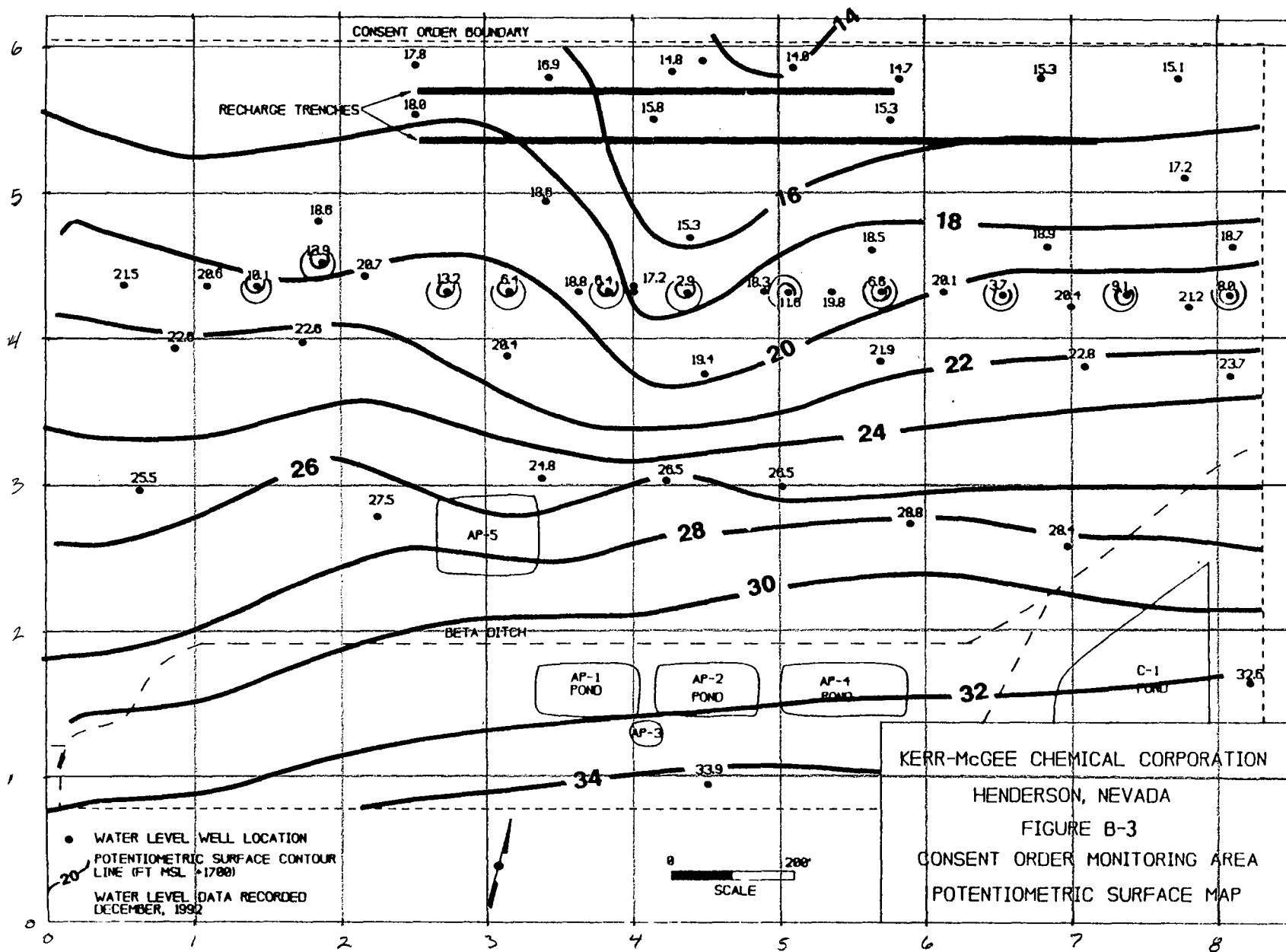


KMCC CONSENT ORDER MONITORING AREA POTENTIOMETRIC SURFACE MAP





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**KERR-McGEE CHEMICAL CORPORATION
HENDERSON, NEVADA FACILITY**

SUMMARY OF RECOMMENDATIONS

<u>Recommended Action</u>	<u>Section</u>	<u>SWMU Number</u>	<u>SWMU Name</u>
NFS	5.1	KMCC-001	"Process Hardware" Storage Area Between Units 1 and 2
NFS	5.2	KMCC-002	Trash Storage Area North of Units 1 and 2
NFS	5.3	KMCC-003	PCB Storage Area - Unit 2
C	5.4	KMCC-004	Hazardous Waste Storage Area North of Unit 2
NFS	5.5	KMCC-005	Sodium Chlorate Filter Cake Holding Area No. of Unit
NFS	5.6	KMCC-006	Hazardous Waste Storage Area Between Units 3 and 4
C	5.7	KMCC-007	Platinum Drying Unit North of Unit 4
NFS	5.8	KMCC-008	Solid Waste Dumpsters
S	5.9	KMCC-009	Manganese Tailings Area
S	5.10	KMCC-010	Old P-2 Surface Impoundment
NFS	5.11	KMCC-011	C-1 Surface Impoundment
NFS	5.12	KMCC-012	Mn-1 Surface Impoundment
NFS	5.13	KMCC-013	Hazardous Waste Landfill (Closed)
S	5.14	KMCC-014	Trade Effluent Settling Ponds (U.S. Gov. Operations)
NFS	5.15	KMCC-015	WC-1 (WC-West) Surface Impoundment
NFS	5.16	KMCC-016	WC-2 (WC-East) Surface Impoundment
NFS	5.17	KMCC-017	Ammonium Perchlorate (AP) Area - Pad 35
NFS	5.18	KMCC-018	Drum Crushing Area
NFS	5.19	KMCC-019	Groundwater Remediation Unit
S	5.20	KMCC-020	The Beta Ditch
NFS	5.21	KMCC-021	Sodium Perchlorate Platinum By-Product Filter-Unit 5
NFS	5.22	KMCC-022	Former Manganese Tailings Area
NFS	5.23	KMCC-023	Closed Surface Impoundment S-1
NFS	5.24	KMCC-024	Closed Surface Impoundment P-1
NFS	5.25	KMCC-025	Truck Emptying/Dump Site
NFS	5.26	KMCC-026	Former Satellite Accumulation Point - Unit 3, Maint. Shop
NFS	5.27	KMCC-027	Former Satellite Accumulation Point - Unit 6, Maint. Shop
NFS	5.28	KMCC-028	Satellite Accumulation Point - AP Laboratory
NFS	5.29	KMCC-029	Satellite Accumulation Point - AP Maintenance Shop

C = Clean Area/Improve Housekeeping

S = Study

NFS = No Further Study under the terms of this current agreement

SUMMARY OF RECOMMENDATIONS (Cont.)

<u>Recommended Action</u>	<u>Section</u>	<u>Spill/Release Designation</u>
NFS	6.1	PCB Transformers
C	6.2	Unit 1 Tenants - Stains
NFS	6.3	Unit 2 Salt Redler
NFS	6.4	Unit 4 and Unit 5 Basements - Consent Agreement
NFS	6.5	Unit 6 Basements - Remediation Project
C	6.6	Diesel Storage Tank Area - Stains
NFS	6.7	Former Old Mair. Cooling Tower and Recirculation Lines
NFS	6.8	Leach Plant Area Manganese Ore Piles
S	6.9	Leach Plant Area Anolyte Tanks
S	6.10	Leach Plant Area Sulfuric Acid Storage Tank
S	6.11	Leach Plant Area Leach Tanks
NFS	6.12	Leach Plant Area Transfer Lines To/From Unit 6
C	6.13	AP Plant Area Screening Building, Dryer Building, and Associated Sum.
S	6.14	AP Plant Area Tank Farm
NFS	6.15	AP Plant Area Change House/Laboratory Septic Tank
NFS	6.16	AP Plant Area Storage Pads - Fire
NFS	6.17	AP Plant Area Old Building D-1 - Wash Down
NFS	6.18	AP Plant Area New Building D-1 - Wash Down
NFS	6.19	AP Plant SIs and Transfer Lines to/From AP SIs
NFS	6.20	AP Plant Transfer Lines to Sodium Chlorate Process
-	7.1	BMI Common Area Disposal (Upper and Lower BMI Ponds)
-	7.2	BMI Common Area Disposal (BMI Landfill)
NFS	7.3	Storm Sewer System
NFS	7.4	Acid Drain System
NFS	7.5	Old Sodium Chlorate Plant Decommissioning
S	7.6	State Industries, Inc. (KMCC Tenant)
C	7.7	J. B. Kelley, Inc. Trucking (KMCC Tenant)
C	7.8	Koch Materials Company (KMCC Tenant)
NFS	7.9	Nevada Precast Concrete Products (KMCC Tenant)
NFS	7.10	Green Ventures International (KMCC Tenant)
C	7.11	Buckles construction Company (KMCC Tenant)
NFS	7.12	Eboney Construction Company (KMCC Tenant)
NFS	7.13	Flintkote Company (KMCC Tenant)
C	7.14	Delbert Madsen & Estate of Delbert Madsen (KMCC Tenant)
C	7.15	Southern Nevada Auto Parts (SNAP) Area (KMCC Tenant)
C	7.16	Dillon Potter (KMCC Tenant)

C = Clean Area/Improve Housekeeping

S = Study

NFS = No Further Study under the terms of this current agreement

KERR-McGEE CHEMICAL CORPORATION
HENDERSON, NEVADA FACILITY

RECOMMENDATIONS

5.0 WASTE MANAGEMENT UNITS AND AREAS

- 5.1 "Process Hardware" Storage Area Between Units 1 and 2 N
This SWMU is being operated in conformance with good operating practices in the industry. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.
- 5.2 Trash Storage Area North of Units 1 and 2 NF
This SWMU is being operated in conformance with good operating practices in the industry. This SWMU does not require further assessment because it does not appear to pose a threat to human health or the environment.
- 5.3 PCB Storage Area - Unit 2 NFS
This SWMU is being operated in accordance with good operating practices and applicable requirements of 40 CFR, part 761 (Reference Doc. #UEO16; SR, August 19, 1981). This SWMU does not require further assessment because it does not appear to pose a threat to human health or the environment.
- 5.4 Hazardous Waste Storage Area North of Unit 2 C
This unit requires no further study. The small amount of oil stained soils observed near the south edge of this SWMU will be removed and properly disposed.
- 5.5 Sodium Chlorate Filter Cake Holding Area North of Unit 3 NFS
This unit requires no further study. This SWMU does not appear to pose a threat to human health or the environment and is operated under RCRA guidelines. Operating practices or housekeeping is being improved to address small markings on the asphalt.
- 5.6 Hazardous Waste Storage Area Between Units 3 and 4 NFS
The present good housekeeping practices reduces the potential for accumulation of the waste on the asphalt. This SWMU does not require further assessment.
- 5.7 Platinum Drying Unit North of Unit 4 C
Operating practices could be revised to reduce releases to the adjacent soil. Area will be cleaned and/or housekeeping is being improved to control volume of material within this unit. This SWMU does not appear to pose a threat to human health or the environment. KMCC will be implementing a filtering process for this recyclable material that should eliminate this unit.
- 5.8 Solid Waste Dumpsters NFS
This SWMU is being operated in conformance with good operating practices in the industry. This SWMU does not require further assessment because it does not appear to pose a threat to human health or the environment.

WASTE MANAGEMENT UNITS AND AREAS (Cont.)

- 5.9 Manganese Tailings Area Study
Additional assessment would be necessary to evaluate whether historic (pre-February 1975) or current manganese tailings management practices have adversely impacted the soil and/or groundwater in the vicinity of the manganese tailings pile.
- 5.10 Old P-2 Surface Impoundment Study
Additional data would be necessary to evaluate the current status of the soil beneath the former pond site.
- 5.11 C-1 Surface Impoundment NFS
This SWMU is being operated in conformance with good operating practices in the industry. Small pressure relief holes in the pipeline have been plugged and the pond has been scheduled to be removed from service as a part of KMCC's goal to eliminate non-essential facility ponds. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.
- 5.12 MN-1 Surface Impoundment NFS
This SWMU is being operated in conformance with good operating practices in the industry. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.
- 5.13 Hazardous Waste Landfill (Closed) NFS
This SWMU is currently under RCRA post-closure care and monitoring. An application for a permit for this unit has been on file with NDEP.
- 5.14 Trade Effluent Settling Ponds (U.S. Government Operations) Study
Additional data would be required to evaluate the current status of the surface soil at the former pond site.
- 5.15 WC-1 (WC-West) Surface Impoundment NFS
This SWMU is being operated in conformance with good operating practices in the industry. The construction plans for this newly built, double-lined pond were approved by NDEP. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.
- 5.16 WC-2 (WC-East) Surface Impoundment NFS
This SWMU is being operated in conformance with good operating practices in the industry. The construction plans for this newly built, double-lined pond were approved by NDEP. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.
- 5.17 Ammonium Perchlorate (AP) Area - Pad 35 NFS
This SWMU is being operated in conformance with good operating practices in the industry. Housekeeping is being improved in this area. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

5.0 WASTE MANAGEMENT UNITS AND AREAS (Cont.)

5.18 Drum Crushing Area NFS
This SWMU is being operated in conformance with good operating practices in the industry. Housekeeping is being improved in this area to address small spills. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

5.19 Groundwater Remediation Unit NFS
This unit is part of an ongoing Consent Agreement with NDEP for remediation of chromium contaminated groundwater.

5.20 The Beta Ditch Study
Additional data would be required to evaluate the current status of the beta ditch.

5.21 Sodium Perchlorate Platinum By-Product Filter - Unit 5 NFS
This SWMU is being operated in conformance with good operating practices in the industry. The containment area has been sealed to prevent minor leaks and housekeeping is being improved for this area. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

5.22 Former Manganese Tailings Area NFS
This unit requires no further study. This SWMU does not appear to pose a threat to human health or the environment.

5.23 Closed Surface Impoundment S-1 NFS
This SWMU has been certified Clean Closed by NDEP.

5.24 Closed Surface Impoundment P-1 NFS
This SWMU has been certified Clean Closed by NDEP.

5.25 Truck Emptying/Dump Site NFS
This area has already been cleaned and access has been prohibited. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

5.26 Former Satellite Accumulation Point - Unit 3, Maintenance Shop NFS
This unit requires no further study. This SWMU, no longer in existence, does not pose a threat to human health or the environment.

5.27 Former Satellite Accumulation Point - Unit 6, Maintenance Shop NFS
This unit requires no further study. This SWMU, no longer in existence, does not pose a threat to human health or the environment.

5.28 Satellite Accumulation Point, AP - Laboratory NFS
This SWMU is being operated in conformance with good operating practices and applicable requirements of 40 CFR 262.34. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

5.0 WASTE MANAGEMENT UNITS AND AREAS (Cont.)

5.29 Satellite Accumulation Point, AP Maintenance Shop NFS
This SWMU is being operated in conformance with good operating practices and applicable requirements of 40 CFR 262.34. This SWMU does not require further assessment because it does not appear to pose threat to human health or the environment.

6.0 KNOWN OR SUSPECTED RELEASES OR SPILLS

6.1 PCB Transformers NFS
Further assessment of this spill is not necessary. The response and clean-up actions were prompt, comprehensive and responsible by complete removal of all contaminated concrete.

6.2 Unit 1 Tenants - Stains C
Remediation will consist of excavating these soils.

6.3 Unit 2 Salt Redler NFS
Further assessment of the Unit 2 Salt Redler is not necessary. Small sodium chloride spills are cleaned up promptly and housekeeping has been improved.

6.4 Unit 4 and Unit 5 Basements - Consent Agreement NFS
The ongoing Consent Order elements are effective in assuring remediation. No further study is recommended. Remediation is underway through implementation of the 1986 Consent Order requirements.

6.5 Unit 6 Basements - Remediation Project NFS
The ongoing Consent Order elements are effective in assuring remediation. No further study is recommended. Remediation is underway through implementation of the 1986 Consent Order requirements.

6.6 Diesel Storage Tanks Area - Stains C
Areas of stained soil will be removed for disposal and underlying soil will be tested and remediated as needed.

6.7 Former Old Main Cooling Tower and Recirculation Lines NFS
Assessment of impacts is not needed since primarily only naturally occurring dissolved salts are involved and constant discharge of high salt concentrations did not occur. Any impact to groundwater by the small concentrations of hexavalent chromium in the cooling tower would be captured and treated by the KMCC groundwater remediation unit.

6.8 Leach Plant Area Manganese Ore Piles NFS
Manganese ore is non-hazardous in nature, i.e. the manganese compounds are not soluble. This area requires no further study.

6.9 Leach Plant Area Anolyte Tanks Study
This area needs further assessment to evaluate the magnitude and extent of potential environmental impacts from historic releases.

6.0 KNOWN OR SUSPECTED RELEASES OR SPILLS (Cont.)

- 6.10 Leach Plant Area Sulfuric Acid Storage Tank Study
This area should be assessed to evaluate the magnitude and extent of potential environmental impacts from historic spills.
- 6.11 Leach Plant Area Leach Tanks Study
This area warrants further assessment to evaluate the potential environmental impacts from historic spills.
- 6.12 Leach Plant Area Transfer Lines To/From Unit 6 Study
The area along the anolyte transfer lines may require further assessment to evaluate the potential environmental impacts from historic releases.
- 6.13 AP Plant Area Screening Building, Dryer Building, and Associated Sump NFS
Area has been cleaned and both housekeeping and drainage have been improved within this unit. This SWMU does not appear to pose a threat to human health or the environment.
- 6.14 AP Plant Area Tank Farm C
Area has been cleaned and housekeeping will be improved to address minor spills at this unit. This SWMU does not appear to pose a threat to human health or the environment.
- 6.15 AP Plant Area Change House/Lab Septic Tank Study
Further assessment of this area would be necessary to evaluate impacts from the septic system.
- 6.16 AP Plant Area Storage Pads - Fire NFS
This area was already cleaned in response to the fire in July 1990 and poses no threat to human health or the environment.
- 6.17 AP Plant Area Old Building D-1 - Wash Down NFS
This area is no longer used but in the past appeared to be operated in conformance with good operating practices in the industry. This area does not require further assessment because it does not appear to pose a threat to human health or the environment.
- 6.18 AP Plant Area New Building D-1 - Wash Down NFS
Further assessment of potential impacts from new D-1 building activities are not necessary due to the short period of operation and implementation of good operating practices.
- 6.19 AP Plant SIs and Transfer Lines To/From AP SIs NFS
Further assessment of potential impacts from the former releases from these transfer lines should not be necessary based on the small size of the releases. Assessment of potential impacts from the pre-1976 discharges would be determined in conjunction with assessment of SWMU KMCC-032 (The Beta Ditch) and assessment of the upper and lower BMI ponds.
- 6.20 AP Plant Transfer Lines to Sodium Chlorate Process NFS
Further assessment of potential impacts from the former releases of sodium hypochlorite from these transfer lines should not be necessary based on the small size of the releases. Assessment of potential impacts from the pre-1976 discharges would be determined in conjunction with assessment of SWMU KMCC-032 (The Beta Ditch) and assessment of the upper and lower BMI ponds.

7.0 MISCELLANEOUS ACTIVITIES

- 7.1 BMI Common Area Disposal (Upper and Lower BMI Ponds)
This area will refer to actions addressed in the Common Area Report.
- 7.2 BMI Common Area Disposal (BMI)
This area will refer to actions addressed in the Common Area Report.
- 7.3 Storm Sewer System NFS
The storm sewers on KMCC property are monitored as a part of the KMCC NPDES permit and do not pose a threat to human health or the environment.
- 7.4 Acid Drain System N F S
The acid drains on KMCC property are monitored as a part of the KMCC NPDES permit and do not pose a threat to human health or the environment.
- 7.5 Old Sodium Chlorate Plant Decommissioning NFS
The old sodium chlorate plant decommissioning was completed by May 1992 and was done under guidelines for RCRA waste where applicable. This area does not appear to pose a threat to human health or the environment.
- 7.6 State Industries, Inc. (KMCC Tenant) S
The area of the ponds will require further assessment to determine the status of the soil in the former pond locations.
- 7.7 J. B. Kelley, Inc. Trucking (KMCC Tenant) C
KMCC will work with the tenant to improve housekeeping of the area.
- 7.8 Koch Materials Company (KMCC Tenant) C
KMCC will work with the tenant to improve housekeeping of the area.
- 7.9 Nevada Precast Concrete Products (KMCC Tenant) NFS
This unit requires no further study. This area, no longer in existence, does not appear to pose a threat to human health or the environment.
- 7.10 Green Ventures International (KMCC Tenant) NFS
This unit requires no further study. This area, no longer in existence, does not appear to pose a threat to human health or the environment.
- 7.11 Buckles Construction Company (KMCC Tenant) C
Operating practices could be revised to reduce releases to the adjacent soil. Area will be cleaned and/or housekeeping will be improved within this unit. This area does not appear to pose a threat to human health or the environment.
- 7.12 Eboney Construction Company (KMCC Tenant) NFS
This unit requires no further study. This area, no longer in existence, does not appear to pose a threat to human health or the environment.



7.0 MISCELLANEOUS ACTIVITIES

- 7.13 Flintkote Company (KMCC Tenant) NFS
This unit requires no further study. This area, no longer in existence, does not appear to pose a threat to human health or the environment.
- 7.14 Delbert Madsen & Estate of Delbert Madsen (KMCC Tenant) C
KMCC will work with the tenant to improve housekeeping of the area.
- 7.15 Southern Nevada Auto Parts (SNAP) Area (KMCC Tenant) C
KMCC will work with the tenant to improve housekeeping of the area.
- 7.16 Dillon Potter (KMCC Tenant) C
KMCC will work with the tenant to improve housekeeping of the area.

SUMMARY.ECA
8-26-92
ejg#2

Notes on Draft Recommendations/Company Responses
Kerr-McGee Chemical Company

- √ 1) On-Site Portions of "Trade Effluent" Settling Ponds and Associated Vitriified Clay Piping, SWMU KMCC-014:

Priority: High, Score 30.0

The size of these ponds and the potential volume of waste material disposed here is the main reason for this unit's High Priority ranking. This area received facility solid wastes from 1945 to 1979. The nature of these wastes is unknown. Liquid wastes disposed in these ponds during government operations consisted of acid effluent and waste caustic liquor.

This appears to be predominantly a pH issue at least for the government period. The nature of solid wastes disposed here requires clarification. In the absence of further documentary evidence, a limited sampling plan should be developed to establish the presence or absence of potential contaminants in this area. This may be possible in conjunction with characterization of adjacent and/or physically and temporally superimposed units.

- √ 2) Open Area Due South of "Trade Effluent" Disposal Ponds:

Priority: High, Score 31.0

The High Priority is due to "unknown" contaminants. KMCC claims this area would be characterized during studies of adjacent and superimposed units such as the Trade Effluent Ponds and the Beta Ditch. We should see that any work plan for these areas includes an investigation of this area.

- 3) Air Pollutant Emissions Associated with Industrial Processes:

Priority: High, Score 35.0

High priority due to unknown nature and potential for widespread contamination.

All of the companies claim that none of their air emissions were depositional in nature and in any case have long since dissipated. I would think that it would be very difficult to chase after historical air emissions at this site. Short of modeling the dispersion patterns and sampling potential fallout areas, I think on site sampling in association with other unit characterizations

will probably address this issue. I think some more definitive documentation to back up the "non-depositional" claim is necessary. (Any investigation of depositional air emissions may better be addressed as a "Common Area" issue.

✓ 4) Hardesty Chemical Company Site:

Priority: High, Score 29.0

High priority due to "unknown" contaminant type. There is no surficial evidence of contamination. Use of potentially hazardous materials does not necessarily mean that a release has occurred. I would recommend limited sampling to put this issue to bed. This may be a Stauffer/Kerr McGee issue.

✓ 5) On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1:

Priority: High, (Score 38.0)

Because of the multi-use character of the Beta Ditch, segments down flow of the Stauffer/Montrose facilities should be studied on a complex wide basis. Segments originating on the various company properties which received discharges from that property only, should be identified and characterized by the property owner. An example would be the portions of the Beta Ditch (or tributaries) which lie wholly on the former Montrose property should be characterized by Montrose. Those portions of the Beta Ditch on KMCC property which received "common" discharges should be characterized by the BMI companies jointly.

OK 6) Unnamed Drainage Ditch Segment:

Priority: Medium, Score 28.0

KMCC states that this is the Northwest Drainage Ditch. This is a BMI Common Areas issue.

✓ 7) Old P-2 Pond and Associated Conveyance Facilities:

Priority: High, Score 32.0

High Priority due to possible Cr+6 contamination due to liner failures. Liner, sludge, and adjacent and underlying soils have been removed to U.S. Ecology. Confirmatory sampling of subsurface soils is required to characterize past impacts to soil/GW. Work Plan to this end should be developed.

- ✓ 8) P-3 Pond and Associated Conveyance Facilities:
Priority: High, Score 32.0
Comments in Recommendations are appropriate.
- ✓ 9) New P-2 Pond and Associated Piping:
Priority: Medium, Score 26.0
Comments in Recommendations are appropriate. Score reflects possible presence of Cr+6.
- ✓ 10) On-Site Hazardous Waste Landfill, SWMU KMCC-013:
Priority: Medium, Score 27.0
Closure approved by NDEP in 1986. Post Closure monitoring ongoing. Post Closure permit pending. Documentation of status should be reviewed. **Does Jeff have these documents?**
- ✓ 11) SWMU KMCC-005:
Priority: Medium, Score 23.0
Old drying pad demolition material sent to U.S. Ecology. No analytical data presented in Phase I report. Since it went to Beatty, U.S. Ecology should have required characterization. No confirmatory sampling of soil after removal of old pad. What regulatory agency (if any) oversaw remediation of the old pad area?
- ✓ 12) Hazardous Waste Storage Area, SWMU KMCC-006:
Priority: None, Score 0.0
No Further Action required.
- ✓ 13) Pond S-1:
Priority: High, Score 29.0
NDEP acknowledged proper closure of this impoundment on 12/5/85. No further action should be required.
- ✓ 14) Pond P-1, and Associated Conveyance Piping:
Priority: Medium, Score 28.0
NDEP acknowledged proper closure of this impoundment on 12/5/85. No further action should be required.
- 15) Platinum Drying Unit, SWMU KMCC-007:

✓ Priority: Medium, Score 27.0

This unit's score reflects the possible presence of Cr+6. Due to documented spillage of platinum and possibly chromium bearing filter cake material, a limited amount of sampling should be undertaken to establish the impact to the environment of such spillage.

✓ 16) Ponds AP-1 and AP-2, and Associated Transfer Lines:

Priority: High, Score 31.0

The score reflects the possible presence of Cr+6. The location of these ponds is not adequately indicated on facility diagrams. The Ponds area and transfer line areas should be sampled for TCLP chromium and possibly for perchlorates and chlorates (reactivity?).

✓ 17) Pond AP-3 and Associated Transfer Lines:

Priority: High, Score 29.0

Score reflects possible chromium contamination. See #16.

✓ 18) Pond AP-4:

Priority: High, Score 30.0

Score reflects possible hazardous nature due to reactivity. Barring this, probably only a TDS issue. Discussion of reactivity issue required. Better location identification required.

✓ 19) Pond AP-5:

Priority: High, Score 31.0

Score reflects possible hazardous nature due to reactivity. Barring this, probably only a TDS issue. Discussion of reactivity issue required. Better location identification required.

✓ 20) Pond C-1 and Associated Piping, SWMU KMCC-011:

Priority: Medium, Score 24.0

TDS issue.

✓ 21) Pond Mn-1 and Associated Piping:

Priority: Medium, Score 20

Based upon the list of materials disposed to this impoundment, this is a TDS issue and falls within the

realm of Water Pollution Control.

- √ 22) Pond WC-1 and Associated Piping, SWMU KMCC-015:

Priority: NFA, Score 0.0

- √ 23) Pond WC-2 and Associated Piping:

Priority: Low, Score 18.0

KMCC states that it will remediate the small stains caused by treatment chemicals used in the WC impoundments. Recommend No Further Action. Water Pollution Control should continue to regulate.

- 24) Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area, SWMU KMCC-009:

Priority: Medium, Score 27.0

TCLP and EP TOX testing demonstrates this area does not contain leachable metals. Other issues concern TDS and possibly pH. KMCC agrees that this area should be sampled to determine whether pre-1975 disposal of slurried Mn waste to the leach beds has impacted soil or ground water. A soil sampling plan for TCLP metals and pH should be developed.

- 25) Process Hardware Storage Area, SWMU KMCC-001:

No Further Action.

- 26) Trash Storage Area:

No Further Action.

- 27) PCB Storage Area, SWMU KMCC-003:

No Further Action.

- 28) Hazardous Waste Storage Area, SWMU KMCC-004:

Priority: Low, Score 18.0

Recommendations appropriate. KMCC says "oil stained" cleanup has been carried out. Cleanup documentation? Otherwise, No Further Action.

- 29) Solid Waste Dumpsters, SWMU KMCC-008:

No Further Action.

- 30) Ammonium Perchlorate Area - Pad 35, SWMU KMCC-017:

No Further Action.

- 31) Drum Crushing and Recycling Area, SWMU KMCC-018:

Priority: Medium, Score 28.0

KMCC states that it will remove minor soil staining in area and revise its practices to residual material in drums prior to crushing. This appears satisfactory. Provide documentation of both.

- 32) Ground Water Remediation Unit, SWMU KMCC-019:

Priority: Low, Score 16.0

KMCC states in their response that the small spills will be cleaned up. No Further Action appears warranted.

- 33) Sodium Perchlorate Platinum By-Product Filter, SWMU KMCC-021:

Priority: Medium, Score 27.0

Material is discharged directly to containers for shipment. No free liquids. Floor seams have been repaired according to KMCC. No Further Action appears warranted.

- 34) Former Manganese Tailings Area, SWMU KMCC-022:

Priority: Medium, Score 24.0

See comment #24 above.

- 35) Truck Emptying/Dump Site, SWMU KMCC-025:

Priority: High, Score 32.0

Disposal of "unknown" wastes during period 1969-1991. Area unlined. Further Characterization of materials disposed here is required. In the absence of this, sampling to determine character should be required. Sampling may be required in any event.

- 36, 37, 38) Former Satellite Accumulation Points:

No Further Action per recommendations.

- 39) Satellite Accumulation Point - AP Maintenance Shop, SWMU KMCC-029:

Priority: Medium, Score 22.0

KMCC states in their response that they will cleanup

small stained area referenced in Recommendations. They should also revise their practices regarding drum storage of 1,1,1 TCA (and other hazardous materials) on bare ground so as to avoid further/future spillage.

40) PCB Transformer Spill:

No Further Action based upon information presented in Final Phase I Report.

41) Unit 1 Tenant Stains:

Priority: Low, Score 16.0

TPH stains. KMCC states in their response that stained soil has been removed. Documentation?

42) Unit 2 Salt Redler:

No Further Action.

43) Unit 4 and 5 Basements:

Priority: Medium, Score 28.0

Residual contaminants in unsaturated soils beneath these units. What can reasonably be done? KMCC falls back on their ground water (chromium) intercept and remediation system. Perhaps we could make KMCC stipulate that upon closure of these units, they will be demolished and the soil beneath them assessed for residual contamination and if necessary, excavated and disposed of.

44) Unit 6 Basement:

Priority: Medium, Score 20.0

Is the GW remediation system capturing and addressing contamination from this unit? See note 43 above. KMCC states that a liner has been installed in the basement of Unit 6 and that during this operation "a significant quantity of soil was removed". Does this "indoor" impoundment or sump have a leak detection system?

45) Diesel Storage Tank:

Priority: Medium, Score 19.0

KMCC states that it plans to remove this tank in the near future and that they will remediate impacted soil. Tank closure/soil remediation documentation including a schedule should be provided to NDEP.

46) Former Old Main Cooling Tower and Recirculation Lines:

No Further Action.

47) Leach Plant Area Manganese Ore Piles:

Priority: Medium, Score 26.0

KMCC states this material is insoluble and therefore poses not environmental threat. Manganese has a secondary MCL of 50 ppb. A soil action level would therefore be 5 ppm. Is this material really an issue?. The material is ore and therefore is not a solid waste (and by inference not a hazardous waste). Is residue or leachate from "ore" storage a solid waste? I would guess that it is exempt.

48) Leach Plant Anolyte Tanks:

Priority: Medium, Score 23.0

General concurrence on further study. KMCC states that Leach plant process tanks have been replaced and that new tanks have secondary containment. Soil surrounding tank area should be characterized for pH and Mn. Sulfuric acid may have mobilized Mn.

49) Leach Plant Area Sulfuric Acid Storage Tank:

Priority: Medium, Score 23.0

KMCC references their response to item 48. Testing of adjacent soils for pH is indicated.

50) Leach Plant Area Leach Tanks:

Priority: Medium, Score 21.0

See 48 and 49 above. pH issue.

51) Leach Plant Area Transfer Lines:

Priority: Medium, Score 22.0

KMCC states that investigations related to item 48 will cover the transfer line area. This appears adequate. A work plan incorporating all the leach plant units/areas of concern is required.

52) AP Plant Area Screening Building, Dryer Building and Associated Sump:

Priority: Medium, Score 24.0

KMCC states in their response that the minor white staining resulting from ammonium perchlorate wash downs

will be cleaned up and they will evaluate their housekeeping practices and modify them as needed. I think they should go into a little more detail regarding this. Otherwise, No Further Action appears necessary.

53) AP Plant Area Tank Farm:

Priority: High, Score 30.0

Score reflects presence of strong oxidizing compounds. KMCC states in their response that they will remove small visual stains and repair or replace the concrete pad. Characterization of area contamination for "reactivity" may be appropriate? In any event, documentation of stained area clean up and pad repair is necessary.

54) AP Plant Area Change House/Laboratory Septic Tank:

Priority: Medium, Score 22.0

General Concurrence that the Lab septic system should be investigated to determine whether disposal of lab chemicals has impacted soil or GW.

55) Area Affected by July 1990 Fire:

Priority: High, Score 30.0

KMCC states in their response that the area impacted by the fire has been remediated and that soils were removed and disposed of at U.S. Ecology. Was a remediation report prepared? Was sampling of the soil (characterization and confirmatory) conducted or was visibly impacted soil just arbitrarily excavated and shipped to Beatty? A little more detailed documentation is required.

56) AP Plant Area Old Building D-1 -- Washdown:

Priority: Medium, Score 23.0

KMCC in their response claims that releases are minor and do not pose a threat to the environment. This claim requires substantiation (technically based argument or limited sampling).

57 and 58) AP Plant Area New Building D-1 -- Washdown and AP Plant Transfer Lines to Sodium Chlorate Process:

No Further Action per Recommendations.

59) Storm Sewer System:

Priority: Medium, Score 22.0

Response to Cutler & Stanfield Comments
on KMCC LOU

✓ 1)

On-Site Portions of "Trade Effluent" Settling Ponds and Associated Vitriified Clay Piping, SWMU KMCC-014:

OK

C & S state that according to the Phase I Report, "the nature of solid materials/wastes placed within this area at various times between 1945 and 1979 is unknown". Thus a broad sampling and analytical scan appears necessary. Cutler & Stanfield also point out that due to the possibility of fill material being present, testing at depth may be necessary. They also point out several subareas of the Trade Effluent ponds which should be addressed in particular (i.e. area of "darker gray colored material", conveyance piping route, and French drain area).

Both our request for the Datachem sampling results and a work plan for characterization of the western portion of the area are preliminary steps. If the Datachem results and/or the work plan do not adequately address potential contaminants in the areas of concern, then work plan modification and/or further sampling in the existing pond area will be required.

2) Open Area Due South of "Trade Effluent" Disposal Ponds:

C & S state that the precise location of this area needs to be identified.

DID WE ADDRESS THIS IN THE C.A.? I DON'T RECALL IT.

Based upon our discussions with KMCC they believe the area has been identified adequately. Also, examination of historical aerial photographs (EPA, 1980..1943, 1950 photo analyses) clearly show this waste disposal area. Apparently the disposal area overlaps onto Stauffer/BMI property. Perhaps this is more appropriately a Common Areas issue?

3) Air Pollutant Emissions Associated with Industrial Processes:

C & S ask what "other sources of information" has KMCC indicated that they will Provide.

OK

They have not indicated any as of yet. Also, just because they were requested to reference passages in the Phase I report which may address these issues, it does not imply that NDEP will necessarily consider these references to be adequate.

4) Hardesty Chemical Company Site:

C & S point out that the Phase I report includes specific references to a "5-year lease" by Hardesty beginning in September of 1946, that they occupied 8 buildings including Unit 2 and produced various compounds of potential concern.

My recollection is that KMCC claimed that they had provided us with all available information regarding Hardesty. C & S may have a point. There appears to be evidence of considerable activity by Hardesty at BMI. Perhaps KMCC does need to do some additional leg work on this one.

5) On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1:

C & S ask whether the identification of conveyance segments would be included in a workplan or as a supplement to the Phase I report. I would say as part of the workplan. Phase I is closed.

7) Old P-2 Pond and Associated Conveyance Facilities:

Cutler & Stanfield question the regulatory status (i.e. closure) of this impoundment and whether Cr is the only contaminant of concern. They also question whether this SI may have impacted GW and whether the Cr Mitigation system satisfactorily addresses this issue.

Since the LOU requires development of a work plan for sampling of subsurface soils in the impoundment area and also requires a full re-evaluation of the mitigation system and the hydrogeologic context in which it operates, I believe C & S's concerns will be addressed. Closure of the SI has been delayed (according to Jeff Denison) to allow resolution of Phase II/III issues.

8) P-3 Pond and Associated Conveyance Facilities:

Cutler & Stanfield note that very little information regarding this SI is included in the Phase I Report. They assert that the regulatory status, location, release history, and contaminated material disposition of this SI need to be explained. I think they have a point. Wouldn't this information be expected in the work plan which the LOU requires or should we modify the LOU after the Public meeting(s)?

DON'T THEY STATE
MORE INFO? OR
WAS THAT
HEALTHY?

I AGREE
RENEGOTIATE

OK

RENEGOTIATE
PRIOR TO PUBLIC
MTGS.

10) On-Site Hazardous Waste Landfill, SWMU KMCC-013:

C & S make the point that the information that the LOU requests will have to be evaluated before determining whether Phase II work is necessary. I think this is an obvious point. Especially important would be the post closure plan. Ground water monitoring would be an imperative in my mind. If the closure and post closure plans for the landfill are inadequate (and I think that is likely), modification or removal may be in order. The idea of allowing a haz waste landfill to remain in a densely populated area would appear to me to be politically very "incorrect".

OK
Answer reveal why
WE NEED HELP IN
THE EVAL. OR PH II!

11) SWMU KMCC-005:

C & S assert that the concrete pad is 36 by 18 feet and that therefore it should be feasible to take confirmatory samples on the "slant". KMCC indicates that approximately 42 tons of demolition debris (mainly concrete with minor amounts of sub-base and soil) were removed and shipped to Beatty and that no visible contamination remained. Let's see what their feasibility study comes up with before resorting to "slant" drilling.

OK

13) Pond S-1:

Cutler & Stanfield question the regulatory status (i.e. closure requirements) of this SI. I think Jeff Denison should address these questions.

I ADDRESS
↑
↓

14) Pond P-1, and Associated Conveyance Piping:

Cutler & Stanfield have the same comment as for item 13 above. We recommended NFA required.

15) Platinum Drying Unit, SWMU KMCC-007:

C & S suggest that the statement in the report that the "area may not be of adequate design for the current use" needs to be addressed. Staining around this unit was indicated to be relatively minor ("some") and the statement by Kleinfelder is nonspecific. However, the requirement in the LOU that KMCC provide analytical data, and/or a technical discussion of the potential environmental impact of ammonium perchlorate and sodium salts along with a discussion of revised housekeeping practices is more than adequate to address this issue. Should this information prove inadequate, NDEP may require modifications of practices or the containment features of the drying unit.

OK

16) Ponds AP-1 and AP-2, and Associated Transfer Lines:

Cutler & Stanfield are concerned that KMCC has identified all historical impoundments at the site. Short of doing the Phase I ourselves, we must be reliant upon the thoroughness of Kleinfelder's work.

IF ANY PI IS THROUGH ITS KMCC!



17) Pond AP-3 and Associated Transfer Lines:

See comment to item 16 above.

20) Pond C-1 and Associated Piping, SWMU KMCC-011:

Cutler & Stanfield are worried about closure of this SI and wonder whether BWPC will address sludge analysis during said closure (said to be planned for this year). Theoretically, BWPC (i.e. Jim Williams) should consult with us regarding the detailed requirements of this (and other BMI) pond closure. This brings up an important point, should we periodically have a short meeting with BWPC so that the right hand will know what the left hand is doing?

I THINK MEETS WOULD BE A GOOD IDEA. THEY SHOULD INCLUDE LEO OR WANT IT ADDITIONAL TO JIM W.

24) Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area, SWMU KMCC-009:

Cutler & Stanfield point out that a site specific ground water monitoring system is not in place for this area and that the current program does not address the appropriate analytes. Our request in the LOU for evaluation of the placement and appropriateness of monitor wells, etc. should make this apparent and additional well may be necessary.

OK

Cutler & Stanfield also point out that during closure of old pond P-1 the liner, sludge contents, and underlying soil was deposited in an onsite nonhazardous waste landfill (which is believed to be SWMU KMCC-009: Leach Beds) and material from remediation of the Unit 6 basement was deposited in the Mn tailings area. As a result, C & S believe a comprehensive Phase II sampling plan is necessary. According to the Phase I report, the solid contents of old pond P-1 were tested after the liquids were solar evaporated. They were determined to be non-hazardous by EP TOX. Underlying soils (disposed) were apparently not sampled (confirmatory sampling was carried out). Material from the basement of Unit 6 contained Manganese sulfate. Is this information justification for a comprehensive sampling program in this area?

??

PROBABLY DOES NOT WARRANT COMPREHENSIVE INVASIVE SAMPLING.

33) Sodium Perchlorate Platinum By-Product Filter, SWMU KMCC-021:

I BELIEVE WE NEED FOR STATEMENTS IN PII TO VERIFY THIS.

Cutler & Stanfield ask whether the cracks in the floor have been repaired. According to statements made by KMCC at our Phase II meeting, the floor seams have been repaired.

34) Former Manganese Tailings Area, SWMU KMCC-022:

OK

Cutler & Stanfield indicate that the Phase I report does not indicate whether there are any monitor wells in place to monitor this area. Since we asked for an evaluation of this in the LOU, I believe this has been adequately taken care of.

OK

They also point out that the history of the Eastern and Western areas is obscure and that reference to TCLP and EP TOX data apply only to the tailings material currently disposed to the area and that therefore, Phase II sampling is required. Our request in the LOU asks KMCC to provide a discussion which demonstrates that pre-1975 waste disposal does not have the potential to impact human health or the environment. If their submittal is judged to be inadequate, then sampling may be required.

43) Unit 4 and 5 Basements:

MAYBE WE NEED TO RESTATE / CLARIFY NEGOTIATE OUR POSITION HERE.

Cutler & Stanfield question whether if KMMC show that it would be expensive to remove or stabilize Cr contaminated soils beneath these units, we would just say that such work would not be required. I think all we asked for in the LOU was an evaluation of the practicality or feasibility of remediating soil in the vadose zone. They make the point that characterization should be the first step. I agree, followed by an evaluation of options for source removal if practicable. Perhaps we should have been a little more clear on this issue in the LOU. I think it is important to know what we may be leaving in place if KMCC convinces us that remediation would require extraordinary effort and expenditure. It is not a forgone conclusion, as C & S seem to think, that KMCC will be able to talk us out of source removal. However, I think that as a result of our first meeting with KMCC, they think we are looking for a good excuse not to pursue remediation beneath these units.

56) AP Plant Area Old Building D-1 -- Washdown:

OK

C & S asks whether the reference to Item 52 in the LOU indicates that cleanup documentation will be required for item 56 as well. Answer: YES

59) Storm Sewer System:

Priority: Medium, Score 22.0

Express

Cutler & Stanfield think that the LOU requirement is unclear and ask whether the flow/integrity testing has been done or will be done. It is my impression that we were expecting the results of completed work. C & S ask whether sampling would be a part of the "technical evaluation". I think sampling would be indicated if the evaluation is inadequate or shows that contamination of soil and/or GW is likely to have occurred.

The requirement for an evaluation of the GW monitoring system should adequately address C & S concern that KMCC may not have in place an array of monitoring wells specific to the sewer system. If their evaluation proves that the existing wells are not appropriate, additional wells may be called for.

60) Acid Drain System:

OK

Cutler & Stanfield's concerns and my response are the same as in item 59.

62) State Industries, Inc. Site, Including Impoundments and Catch Basin:

WE HAVE A STATE WORK PLAN IN THE PO TO LABEL THE BUILDING INCL. (FILL LOOK.)

Cutler & Stanfield are concerned that the westernmost impoundment (which was covered by a warehouse in 1983) be characterized. It was my understanding that characterization of this SI is covered in the LOU. C & S are also concerned that the SI may not be the only source of contaminants. The Phase I report does not indicate any other areas of concern (other than the former SIs) on the former leasehold of State Industries.

64) Koch Materials Company Site:

OK

Cutler & Stanfield ask whether remediation has been undertaken. Documentation of remediation and modification of practices is implicate in the LOU requirement.

66) Above-Ground Diesel Storage Tank Leased by Flintkote Co.

OK

Cutler & Stanfield feel that work is necessary to verify that soil in the vicinity of the former tank is not contaminated. During our meeting, KMCC told us that the location of the former tank is not known with any great degree of certainty and no soil staining is evident in any case. If you don't know where to sample, it is difficult to do so without setting up a grid and

collecting an unreasonable number of samples. In the absence of any positive evidence, it would be presumptive to have KMCC "shotgun" the area.

67) Delbert Madsen and Estate of Delbert Madsen Site:

Assess
↑
Cutler & Stanfield state that this area needs to be addressed in Phase II. I think what the LOU requires, as a start, is that KMCC tell us what has been done to address/assess potential contamination on this site.

68) Southern Nevada Auto Parts Site:

Cutler & Stanfield state that this area needs to be addressed in Phase II. I think what the LOU requires, as a start, is that KMCC tell us what has been done to address/assess potential contamination on this site.

67, 68 ARE EXACTLY THE TYPES OF ISSUES
P II WAS DESIGNED TO ADDRESS.

Notes on Draft Recommendations/Company Responses
Kerr-McGee Chemical Company

- 1) On-Site Portions of "Trade Effluent" Settling Ponds and Associated Vitrified Clay Piping, SWMU KMCC-014:

Priority: High, Score 30.0

The size of these ponds and the potential volume of waste material disposed here is the main reason for this unit's High Priority ranking. This area received facility solid wastes from 1945 to 1979. The nature of these wastes is unknown. Liquid wastes disposed in these ponds during government operations consisted of acid effluent and waste caustic liquor.

This appears to be predominantly a pH issue at least for the government period. The nature of solid wastes disposed here requires clarification. In the absence of further documentary evidence, a limited sampling plan should be developed to establish the presence or absence of potential contaminants in this area. This may be possible in conjunction with characterization of adjacent and/or physically and temporally superimposed units.

K-353 document on sampling
Propose sampling plan for western
part of ponds, east of berm
Analytes will be identified through
historical use

- 2) Open Area Due South of "Trade Effluent" Disposal Ponds:

Priority: High, Score 31.0

The High Priority is due to "unknown" contaminants. KMCC claims this area would be characterized during studies of adjacent and superimposed units such as the Trade Effluent Ponds and the Beta Ditch. We should see that any work plan for these areas includes an investigation of this area.

Will be included in investigation of
item #1.

3) Air Pollutant Emissions Associated with Industrial Processes:

Priority: High, Score 35.0

High priority due to unknown nature and potential for widespread contamination.

All of the companies claim that none of their air emissions were depositional in nature and in any case have long since dissipated. I would think that it would be very difficult to chase after historical air emissions at this site. Short of modeling the dispersion patterns and sampling potential fallout areas, I think on site sampling in association with other unit characterizations will probably address this issue. I think some more definitive documentation to back up the "non-depositional" claim is necessary. (Any investigation of depositional air emissions may better be addressed as a "Common Area" issue.

Site the specifics in Phase I to the depositional qualities of the air emissions.

4) Hardesty Chemical Company Site:

Priority: High, Score 29.0

High priority due to "unknown" contaminant type. There is no surficial evidence of contamination. Use of potentially hazardous materials does not necessary mean that a release has occurred. I would recommend limited sampling to put this issue to bed. This may be a Stauffer/Kerr McGee issue.

Reference JB Kelly well data.

Reference that there is no additional info. (location, etc.)

-
-
-
-
-
-
- 5) On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1:

Priority: High, Score 38.0

Because of the multi-use character of the Beta Ditch, segments down flow of the Stauffer/Montrose facilities should be studied on a complex wide basis. Segments originating on the various company properties which received discharges from that property only, should be identified and characterized by the property owner. An example would be the portions of the Beta Ditch (or tributaries) which lie wholly on the former Montrose property should be characterized by Montrose. Those portions of the Beta Ditch on KMCC property which received "common" discharges should be characterized by the BMI companies jointly.

Refer to common areas.

- 6) Unnamed Drainage Ditch Segment:

Priority: Medium, Score 28.0

KMCC states that this is the Northwest Drainage Ditch. This is a BMI Common Areas issue.

Refer to common areas.

- 7) Old P-2 Pond and Associated Conveyance Facilities:

Priority: High, Score 32.0

High Priority due to possible Cr+6 contamination due to liner failures. Liner, sludge, and adjacent and underlying soils have been removed to U.S. Ecology. Confirmatory sampling of subsurface soils is required to characterize past impacts to soil/GW. Work Plan to this end should be developed.

Conduct additional sampling.

8) P-3 Pond and Associated Conveyance Facilities:

Priority: High, Score 32.0

Comments in Recommendations are appropriate.

Refer to item #7.

9) New P-2 Pond and Associated Piping:

Priority: Medium, Score 26.0

Comments in Recommendations are appropriate. Score reflects possible presence of

Cr+6.

Provide layout on pond design,
operational status, regulatory
status and any release history
that is available.

10) On-Site Hazardous Waste Landfill, SWMU KMCC-013:

Priority: Medium, Score 27.0

Closure approved by NDEP in 1986. Post Closure monitoring ongoing. Post Closure permit pending. Documentation of status should be reviewed. **Does Jeff have these documents?**

Copies of letters dated April 16, 1985
and January 17, 1986.

Need documentation of post-closure
plan.

Jeff will check on progress with
permit.

11) SWMU KMCC-005:

Priority: Medium, Score 23.0

Old drying pad demolition material sent to U.S. Ecology. No analytical data presented in Phase I report. Since it went to Beatty, U.S. Ecology should have required characterization. No confirmatory sampling of soil after removal of old pad. What regulatory agency (if any) oversaw remediation of the old pad area?

Statement on what Alan Gaddy did
and reasons why kmcc can't do
any further sampling.

12) Hazardous Waste Storage Area, SWMU KMCC-006:

Priority: None, Score 0.0

No Further Action required.

13) Pond S-1:

Priority: High, Score 29.0

NDEP acknowledged proper closure of this impoundment on 12/5/85. No further action should be required.

14) Pond P-1, and Associated Conveyance Piping:

Priority: Medium, Score 28.0

NDEP acknowledged proper closure of this impoundment on 12/5/85. No further action should be required.

Pending review of files in the
absence of any further problems.

15) Platinum Drying Unit, SWMU KMCC-007:

Priority: Medium, Score 27.0

This unit's score reflects the possible presence of Cr+6. Due to documented spillage of platinum and possibly chromium bearing filter cake material, a limited amount of sampling should be undertaken to establish the impact to the environment of such spillage.

Kmcc to submit an argumentative response as to why this area is not a problem. Also revised housekeeping procedures and how they have been modified. Provide documentation of sampling done.

16) Ponds AP-1 and AP-2, and Associated Transfer Lines:

Priority: High, Score 31.0

The score reflects the possible presence of Cr+6. The location of these ponds is not adequately indicated on facility diagrams. The Ponds area and transfer line areas should be sampled for TCLP chromium and possibly for perchlorates and chlorates (reactivity?).

Need documentation on soil sampling concerning chromium.

Need a better facility diagram and flow diagram.

AP ponds - adequate monitoring, well locations, design, analytical data.

Statement as to if reactivity exists.

Tell us why no blow up @.

17)

Pond AP-3 and Associated Transfer Lines:

Division will meet with NPDS people to discuss TDS problem.

Priority: High, Score 29.0

Score reflects possible chromium contamination. See #16.

Refer to Item # 16

18) Pond AP-4:

Priority: High, Score 30.0

Score reflects possible hazardous nature due to reactivity. Barring this, probably only a TDS issue. Discussion of reactivity issue required. Better location identification required.

Refer to item # 16

Chromium not an issue here.

19) Pond AP-5:

Priority: High, Score 31.0

Score reflects possible hazardous nature due to reactivity. Barring this, probably only a TDS issue. Discussion of reactivity issue required. Better location identification required.

Refer to Item # 16

Chromium is not an issue here.

20) Pond C-1 and Associated Piping, SWMU KMCC-011:

Priority: Medium, Score 24.0

TDS issue.

NDEP will discuss TDS issue with
NPS people.

21) Pond Mn-1 and Associated Piping:

Priority: Medium, Score 20

Based upon the list of materials disposed to this impoundment, this is a TDS issue and falls within the realm of Water Pollution Control.

Refer to Item #20

22) Pond WC-1 and Associated Piping, SWMU KMCC-015:

Priority: NFA, Score 0.0

No further action.

23) Pond WC-2 and Associated Piping:

Priority: Low, Score 18.0

KMCC states that it will remediate the small stains caused by treatment chemicals used in the WC impoundments. Recommend No Further Action. Water Pollution Control should continue to regulate.

Statement about housekeeping and engineering process.

24) Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area, SWMU KMCC-009:

Priority: Medium, Score 27.0

TCLP and EP TOX testing demonstrates this area does not contain leachable metals.

Other issues concern TDS and possibly pH. KMCC agrees that this area should be sampled to determine whether pre-1975 disposal of slurry in waste to the leach beds has impacted soil or ground water. A soil sampling plan for TCLP metals and pH should be developed.

Reference TCLP data for leach beds.

Argument as to why this relates to pre-1975.

Are monitoring wells adequate? Location, design

Reference wells intended for use, specifics of them, placement of monitoring wells.

25) Process Hardware Storage Area, SWMU KMCC-001:

No Further Action.

26) Trash Storage Area:

No Further Action.

27) PCB Storage Area, SWMU KMCC-003:

No Further Action.

28) Hazardous Waste Storage Area, SWMU KMCC-004:

Priority: Low, Score 18.0

Recommendations appropriate. KMCC says "oil stained" cleanup has been carried out. Cleanup documentation? Otherwise, No Further Action.

Documentation of clean up,
80-15 tests.

29) Solid Waste Dumpsters, SWMU KMCC-008:

No Further Action.

30) Ammonium Perchlorate Area - Pad 35, SWMU KMCC-017:

No Further Action.

31) Drum Crushing and Recycling Area, SWMU KMCC-018:

Priority: Medium, Score 28.0

KMCC states that it will remove minor soil staining in area and revise its practices to residual material in drums prior to crushing. This appears satisfactory. Provide documentation of both.

Provide documentation of both areas.
Explain how these areas were documented.

32) Ground Water Remediation Unit, SWMU KMCC-019:

Priority: Low, Score 16.0

KMCC states in their response that the small spills will be cleaned up. No Further Action appears warranted.

Housekeeping issues and documentation of clean up and modifications of unit.

33) Sodium Perchlorate Platinum By-Product Filter, SWMU KMCC-021:

Priority: Medium, Score 27.0

Material is discharged directly to containers for shipment. No free liquids. Floor seams have been repaired according to KMCC. No Further Action appears warranted.

34) Former Manganese Tailings Area, SWMU KMCC-022:

Priority: Medium, Score 24.0

See comment #24 above.

Refer to item #24

35) Truck Emptying/Dump Site, SWMU KMCC-025:

Priority: High, Score 32.0

Disposal of "unknown" wastes during period 1969-1991. Area unlined. Further Characterization of materials disposed here is required. In the absence of this, sampling to determine character should be required. Sampling may be required in any event.

Propose a sampling plan.
Characterizations of wastes in this area. SOW.

36, 37, 38) Former Satellite Accumulation Points:

No Further Action per recommendations.

39) Satellite Accumulation Point - AP Maintenance Shop, SWMU KMCC-029:

Priority: Medium, Score 22.0

KMCC states in their response that they will cleanup small stained area referenced in Recommendations. They should also revise their practices regarding drum storage of 1,1,1 TCA (and other hazardous materials) on bare ground so as to avoid further/future spillage.

Documentation on clean up.
Define that there is no association
between TCA and soil stain.
Reference modifications to house -
keeping.

40) PCB Transformer Spill:

No Further Action based upon information presented in Final Phase I Report.

41) Unit 1 Tenant Stains:

Priority: Low, Score 16.0

TPH stains. KMCC states in their response that stained soil has been removed. Documentation?

All documentation on clean up.

42) Unit 2 Salt Redler:

No Further Action.

43) Unit 4 and 5 Basements:

Priority: Medium, Score 28.0

Residual contaminants in unsaturated soils beneath these units. What can reasonably be done? KMCC falls back on their ground water (chromium) intercept and remediation system. Perhaps we could make KMCC stipulate that upon closure of these units, they will be demolished and the soil beneath them assessed for residual contamination and if necessary, excavated and disposed of.

A full re-evaluation of chromium recovery system. Will be a stand alone document.

Models and parameters used.

44) Unit 6 Basement:

Priority: Medium, Score 20.0

Is the GW remediation system capturing and addressing contamination from this unit? See note 43 above. KMCC states that a liner has been installed in the basement of Unit 6 and that during this operation "a significant quantity of soil was removed". Does this

"indoor" impoundment or sump have a leak detection system?

Reference to wells (GW) and that there is no association with basement.

Statement on liner, that it is checked semi-annually.

45) Diesel Storage Tank:

Priority: Medium, Score 19.0

KMCC states that it plans to remove this tank in the near future and that they will remediate impacted soil. Tank closure/soil remediation documentation including a schedule should be provided to NDEP.

Address soil contamination pending on removal of tank, not to exceed 180 days.

46) Former Old Main Cooling Tower and Recirculation Lines:

No Further Action.

47) Leach Plant Area Manganese Ore Piles:

Priority: Medium, Score 26.0

KMCC states this material is insoluble and therefore poses not environmental threat. Manganese has a secondary MCL of 50 ppb. A soil action level would therefore be 5 ppm. Is this material really an issue?. The material is ore and therefore is not a solid

waste (and by inference not a hazardous waste). Is residue or leachate from "ore" storage a solid wa ? I would guess that it is exempt.

Reference hygiene studies on
Mn exposure to on site workers.

48) Leach Plant Analyte Tanks:

Priority: Medium, Score 23.0

General concurrence on further study. KMCC states that Leach plant process tanks have been replaced and that new tanks have secondary containment. Soil surrounding tank area should be characterized for pH and Mn. Sulfuric acid may have mobilized Mn.

Propose sampling plan.
Get representative samples of the
area.

GW monitoring.
pH Issue

49) Leach Plant Area Sulfuric Acid Storage Tank:

Priority: Medium, Score 23.0

KMCC references their response to item 48. Testing of adjacent soils for pH is indicated.

Refer to item # 48

50) Leach Plant Area Leach Tanks:

Priority: Medium, Score 21.0

See 48 and 49 above. pH issue.

Refer to item #48

51) Leach Plant Area Transfer Lines:

Priority: Medium, Score 22.0

KMCC states that investigations related to item 48 will cover the transfer line area. This appears adequate. A work plan incorporating all the leach plant units/areas of concern is required.

Refer to item #48

52) AP Plant Area Screening Building, Dryer Building and Associated Sump:

Priority: Medium, Score 24.0

KMCC states in their response that the minor white staining resulting from ammonium perchlorate wash downs will be cleaned up and they will evaluate their housekeeping practices and modify them as needed. I think they should go into a little more detail regarding this. Otherwise, No Further Action appears necessary.

Technically based argument on why AP area is not a problem or sampling of total N = 1 sample from m-38 downgradient well, 1 sample in upgradient well, from potential areas. Division will find out what kind of testing to be done for N and GW. Documentation on clean up and house-keeping practices. Any modifications.

53)

AP Plant Area Tank Farm:

Priority: High, Score 30.0

Score reflects presence of strong oxidizing compounds. KMCC states in their response that they will remove small visual stains and repair or replace the concrete pad. Characterization of area contamination for "reactivity" may be appropriate? In any event, documentation of stained area clean up and pad repair is necessary.

Documentation of stained area clean up and pad repair.

54) AP Plant Area Change House/Laboratory Septic Tank:

Priority: Medium, score 22.0

General Concurrence that the Lab septic system should be investigated to determine whether disposal of lab chemicals has impacted soil or GW.

SOW for investigation,

55) Area Affected by July 1990 Fire:

Priority: High, Score 30.0

KMCC states in their response that the area impacted by the fire has been remediated and that soils were removed and disposed of at U.S. Ecology. Was a remediation report prepared? Was sampling of the soil (characterization and confirmatory) conducted or was visibly impacted soil just arbitrarily excavated and shipped to Beatty? A little more detailed documentation is required.

State that material was taken to Beatty as non-hazardous material. How much?

56) AP Plant Area Old Building D-1 -- Washdown:

Priority: Medium, Score 23.0

KMCC in their response claims that releases are minor and do not pose a threat to the

environment. This claim requires substantiation (technically based argument or limited sampling).

Technically based argument on why area is not a problem.

57 and 58) AP Plant Area New Building D-1 -- Washdown and AP Plant Transfer Lines to Sodium Chlorate Process:

No Further Action per Recommendations.

59) Storm Sewer System:

Priority: Medium, Score 22.0

KMCC states that no further study is recommended. Historic leaks from this system may have impacted soil and/or GW. Segments of the system which are or have been used by other BMI companies should be addressed as a BMI Common Areas issue. Discrete (KMCC use only) segments should be evaluated for potential contaminant type and release potential. Some segments may require adjacent soil boring and sampling.

Flow information
Documentation on GW assessment.
Overall GW assessment will evaluate hot spots.

60) Acid Drain System:

Priority: Medium, Score 23.0

The issue is not current discharges but potential impacts from historic use. KMCC says NFA. See note #7 above. pH issue. Possibly other contaminants as well.

GW monitoring

61) Old Sodium Chlorate Plant Decommissioning:

No Further Action per Recommendations.

62) State Industries, Inc. Site, Including Impoundments and Catch Basin:

Priority: High, Score 32.0

Characterization of impoundments and Catch Basin is required. Additional information on potential contaminants should be gathered if possible in order to limit analyses. Otherwise, a full screen may be necessary. KMCC agrees that the ponds need additional assessment.

SOW for additional assessment.

63) J.B. Kelley, Inc. Trucking Site:

Priority: Low, Score 17.0

The underground vault water/sludge and soil potentially impacted by rinsate should be

sampled and analyzed. A schedule and documentation of UST closure and associated soil and/or GW remediation should be provided to NDEP.

Letter from Clark Co.

Documentation from Kmcc.

64) Koch Materials Company Site:

Priority: Low, Score 18.0

Characterization and remediation of hydrocarbon contamination is required. Storage tanks should be provided with concrete secondary containment structures.

Documentation on how Kmcc is working with tenant to clean this up. Division will step in if necessary.

65) Nevada Precast Concrete, etc....

Priority: Low, Score 11.0

Hydrocarbon staining north of Unit 1 should be remediated.

Refer to item #41, if not coincident, then refer to item #64.

66) Above-Ground Diesel Storage Tank Leased by Flintkote Co.

Priority: Low, Score 17.0

Exact former location unknown, but no visible staining present. No Further Action appears warranted.

67) Delbert Madsen and Estate of Delbert Madsen Site:

Priority: Medium, Score 22.0

Assessment of tenant site is required. Possible asbestos, lead, hydrocarbons.

Documentation on how kmcc is working with tenant and a better assessment on what contaminants are there.

68) Southern Nevada Auto Parts Site:

Priority: Medium, Score 23.0

This is a wrecking yard. Operation of such a business is inherently dirty. Should characterization and remediation be pursued prior to change of parcel use. To let it go is inconsistent with our requirements for other sites.

Refer to item #67.

69) Dillon Potter Site:

No Further Action per Recommendations.

Ponds west of bldg., under ware-
house.

Will take 1 sample each for each
pond. TCLP sampling along with
pH.



KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

December 29, 1999

RECEIVED

JAN 04 2000

ENVIRONMENTAL PROTECTION

Mr. Robert Kelso
Supervisor Remediation Branch
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0866

Dear Mr. Kelso:

Subject: Exclusion Request for Black Mountain Industrial Center - KERR-MCGEE Property

Kerr-McGee Chemical LLC (Kerr-McGee) requests a no further action determination and a written assurance regarding future liability for a portion of Kerr-McGee's property (the Property) within Clark County, Nevada, also within the limits of the City of Henderson. The Property is more fully described in the legal description, which is attached as Exhibit A and incorporated by this reference. Kerr-McGee also requests release of the Property from the terms, requirements and obligations of the Consent Agreement entered into by the NDEP respecting the Kerr-McGee Henderson facility, dated August 12, 1996.

Kerr-McGee's request is based on an assessment of the Property, the Environmental Conditions Assessment (ECA), Kerr-McGee Chemical Corporation, Henderson, NV (Kleinfelder, Inc., April 15, 1993) and a subsequent Phase I Environmental Site Assessment - Verne Vohs Lease Area (ENSR), November 1999. The Phase I Site Assessment of the Vohs Area is attached. In addition, NDEP has previously issued a no further action determination (to the City of Henderson (COH) on a parcel adjacent to the Property. The adjacent parcel is included in the Warm Springs right-of-way. Kerr-McGee believes the ECA report, the Vohs area assessment, and the COH characterization of the adjacent parcel, with its subsequent NDEP release, provide an adequate characterization of the environmental conditions relating to the Property, which this exclusion request covers, and fulfills the environmental assessment requirements of the NDEP's letter to Basic Management, Inc. dated March 8, 1994. The letter states, "If the environmental assessment for a particular parcel indicates no public health or environmental problems are present, the Division will issue a letter indicating development may proceed on the property." Kerr-McGee desires to allow Property development and requests a letter stating that no further actions are necessary with respect to the Property, certifying that development may proceed without environmental restriction and assuring third parties that the NDEP will not seek to hold them liable for any environmental conditions on the Property.

If you have any questions please call me at (702) 651-2234. Thank you for your consideration and assistance.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Attachment

cc: PSCorbett
WOGreen
RHJones
P Odom
TWRreed
FRStater
Robin Bain, BMI
Gregory W. Schlink, BMI
Thomas Whalen, NDEP
Rick Simon, ENSR

EXHIBIT A

**Property
Description**

LEGAL DESCRIPTION

**VVLC
NORTH AREA, (NORTH OF WARM SPRINGS ROAD)**

BEING A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 1 AND A PORTION OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 12, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA.

BEGINNING AT THE SOUTHWEST CORNER OF SAID SECTION 1, COMMON TO SECTIONS 2, 11, AND 12; THENCE NORTH 01°39'10" WEST, ALONG THE WEST LINE OF THE SOUTHWEST QUARTER (SW ¼) OF SAID SECTION 1, A DISTANCE OF 1322.35 FEET; THENCE SOUTH 89°57'09" EAST, DEPARTING SAID WEST LINE, A DISTANCE OF 1254.54 FEET; THENCE NORTH 88°47'11" EAST, A DISTANCE OF 25.02 FEET; THENCE SOUTH 01°14'12" EAST, A DISTANCE OF 1315.49 FEET; THENCE SOUTH 89°52'45" EAST, A DISTANCE OF 645.06 FEET; THENCE SOUTH 01°27'57" WEST, A DISTANCE OF 2072.95 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 15050.00 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 23°24'17" EAST; THENCE ALONG SAID CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 1°16'29" AN ARC LENGTH OF 33486 FEET; THENCE NORTH 67°52'13" WEST, A DISTANCE OF 1062.50 FEET TO THE EAST LINE OF THE NORTHWEST QUARTER (NW ¼) OF SAID SECTION 12; THENCE NORTH 01°46'08" EAST, ALONG SAID EAST LINE, A DISTANCE OF 221.45 FEET TO THE POINT OF BEGINNING.

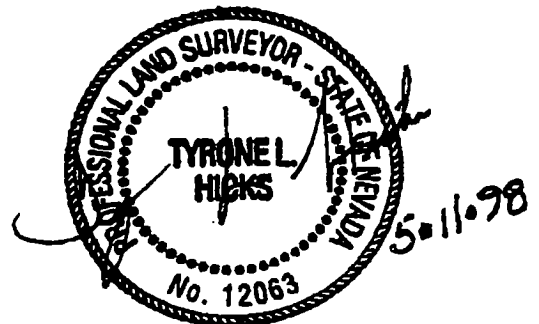
CONTAINING 52.89 ACRES, MORE OR LESS.

BASIS OF BEARINGS

THE BASIS OF BEARING FOR THIS LEGAL DESCRIPTION IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NC83) EAST ZONE (2701).

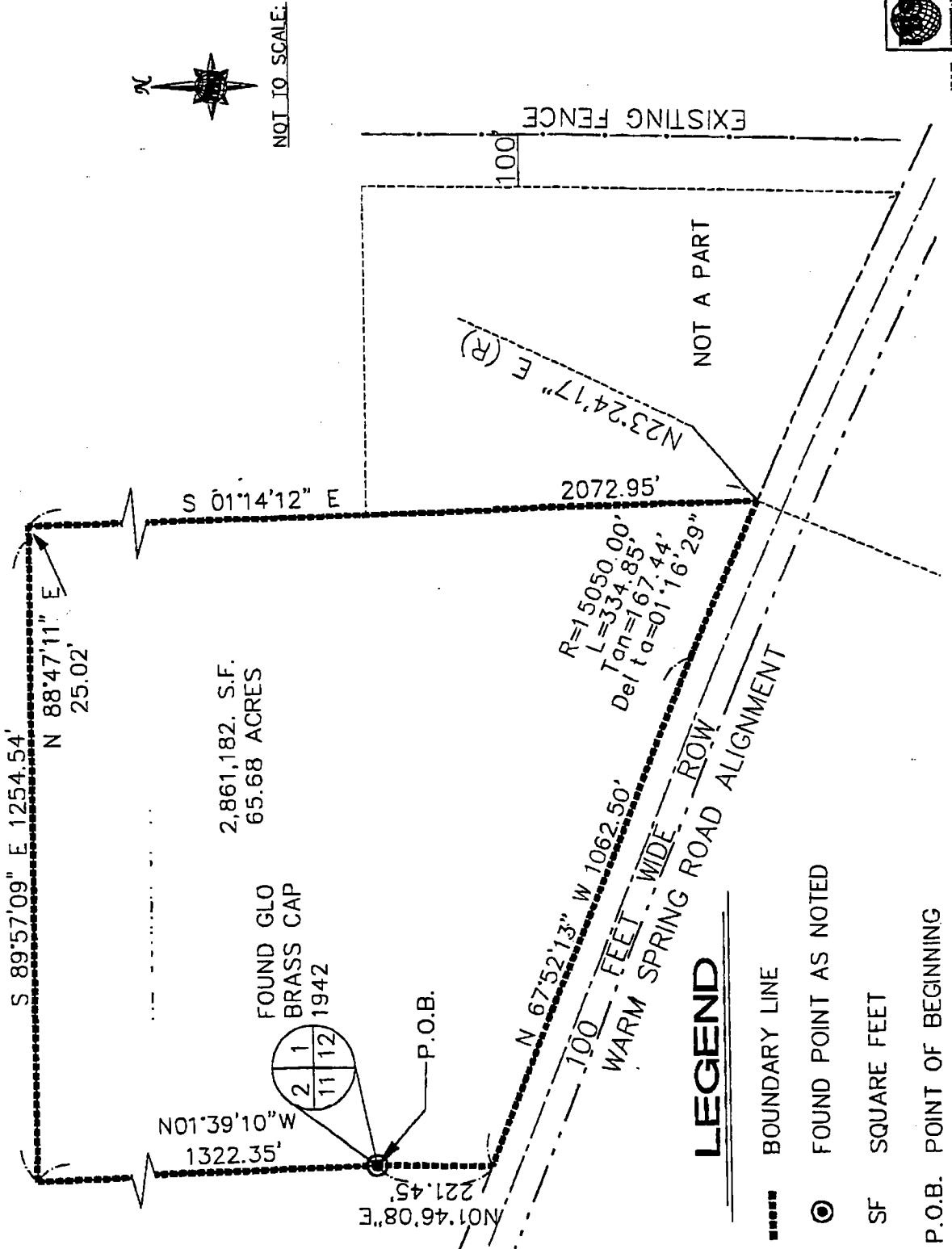
NOTE:

THE ABOVE BOUNDARY DESCRIPTION DOES NOT REPRESENT A LEGAL PARCEL OF LAND PER NEVADA REVISED STATUTES, CHAPTER 278, UNTIL SUCH A TIME A SUBDIVISION MAP IS RECORDED.



**BLACK MOUNTAIN INDUSTRIAL CENTER
EXHIBIT TO ACCOMPANY LEGAL DESCRIPTION**

A PORTION OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1 AND A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF SECTION 12, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA



LEGEND

- BOUNDARY LINE
- ⊗ FOUND POINT AS NOTED
- SF SQUARE FEET
- P.O.B. POINT OF BEGINNING

Ms. Susan M. Crowley
Staff Environmental Specialist
Kerr-McGee Chemical LLC
Post Office Box 55
Henderson, Nevada 89009

RE: Conditional No Further Action Determination (Vern Vohs Lease Area)

Dear Ms. Crowley:

The Nevada Division of Environmental Protection (NDEP) has completed its review of the request by Kerr-McGee Chemical LLC (KMC) of December 29, 1999, for a no further action determination for a portion of their property described as the Vern Vohs Lease Area within the Black Mountain Industrial Center in Clark County, Nevada. The Property is more fully described in the attached legal description and letter of request, which is incorporated by this reference.

Our review has included available information regarding environmental conditions on the Property such as the Environmental Conditions Assessment (ECA), Kerr-McGee Chemical Corporation, Henderson, NV (Kleinfelder, Inc., April 15, 1993) and a subsequent Phase I Environmental Site Assessment - Vern Vohs Lease Area (ENSR), November 1999. Based on our review of this information, we have concluded that no further actions are required or necessary with respect to the soils on the Property to protect human health or the environment. NDEP hereby excludes the soils on the Property from any further environmental assessment or other response action, and agrees that development may proceed on the Property subject to the following environmental restriction based on known present conditions:

The groundwater in the upper alluvium (shallow aquifer) below this property, as determined by groundwater samples from monitoring well PC-70, contains contaminants of concern from the manufacturing and waste disposal operations by Kerr-McGee at their plant facilities. A "No Further Action" decision cannot be made by NDEP regarding the groundwater at this time. Let it be noted by a deed restriction or other legal agreement that no subsurface disruption or penetration shall be made of the underlying Muddy Creek formation that may cause cross contamination of the subsurface aquifers without the prior approval of NDEP and that reasonable access to perform ground water remediation will be provided if necessary. The NDEP fully releases and discharges the soils on the Property from any and all terms, requirements and obligations of those certain Consent Agreement which was entered into by the NDEP respecting the Kerr-McGee Henderson facility, dated August 12, 1996.

In consideration of the fulfillment of NDEP's environmental assessment of the soils and no further action requirements, the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("Division") hereby releases, discharges and covenants not to seek to hold any purchaser, tenant, lender or other third party which acquires an interest in the Property, or any of their officers, directors, partners, employees, agents, successors, affiliates or assigns, (collectively "Parties") liable as owners, operators or in any

other manner, in law or in equity, under any statute, regulation or any federal, state or common law, for soil contamination known to exist at or on the Property and described in the ECA Report, Phase I Site Assessment, legal description and letter of request. The Division reserves, and the foregoing sentence is without prejudice to, all of its authorities with respect to the discovery of contaminated soil conditions at, on, in or below the Property that are not described in the ECA Report and Phase I Site Assessment and the receipt by the Division of information, previously unknown to the Division, in the event that either such condition or information indicate an actual or potential threat to human health or the environment. The Division acknowledges that Kerr-McGee Chemical LLC and other Parties may rely on the covenants in this paragraph in connection with the purchase, sale, gift, and development of the Property, and consents to such reliance. The Division requests the recordation of these covenants or a recordable notation of them in the Clark County Recorder's Office.

Sincerely,

Allen Biaggi
Administrator

cc: Barry Conaty, Cutler & Stanfield, 700 14th St., NW, Washington, DC 20005
Philip Speight, City Manager, 240 Water St., Henderson, NV 89015

ATTACHMENT 1

**Lake Mead Water
Analytical Information**

NEL LABORATORIES

Reno • Las Vegas
Phoenix • So. California

Las Vegas Division
4208 Arcata Way, Suite A • Las Vegas, NV 89030
(702) 657-1010 • Fax: (702) 657-1577
1-888-368-3282

CLIENT: Kerr-McGee Chemical Corporation
8000 West Lake Mead Drive
Henderson, NV 89015
ATTN: Mark Porterfield

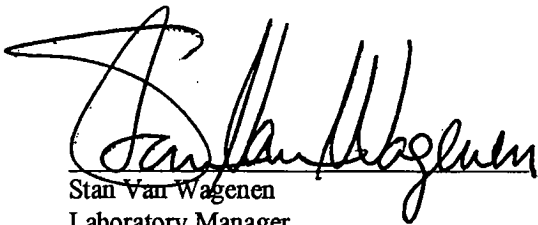
PROJECT NAME: GWTP-UIC-April/NA
PROJECT NUMBER: NA

NEL ORDER ID: L0004081

Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 4/10/00.

Should you have any questions or comments, please feel free to contact our Client Services department at (702) 657-1010.



Stan Van Wagenen
Laboratory Manager

4/19/00
Date

CERTIFICATIONS:

	Reno	Las Vegas	S. California
Arizona	AZ0520	AZ0518	AZ0605
California	1707	2002	2264
US Army Corps of Engineers	Certified	Certified	

	Reno	Las Vegas	S. California
Idaho	Certified	Certified	
Montana	Certified	Certified	
Nevada	NV033	NV052	CA084
L.A.C.S.D.			10228

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-April/NA
 PROJECT #: NA
 TEST: Volatile Organic Compounds by EPA 8260B, December 1996
 METHOD: EPA 8260
 MATRIX: Aqueous
 DILUTION: 1

CLIENT ID: GWTP-UIC-APRIL
 DATE SAMPLED: 4/10/00
 NEL SAMPLE ID: L0004081-01
 EXTRACTED: 4/14/00
 ANALYZED: 4/14/00
 ANALYST: BJV - Las Vegas Division

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25. µg/L	1,1-Dichloropropene	ND	5. µg/L
Benzene	ND	5. µg/L	cis-1,3-Dichloropropene	ND	5. µg/L
Bromobenzene	ND	5. µg/L	trans-1,3-Dichloropropene	ND	5. µg/L
Bromochloromethane	ND	5. µg/L	Ethylbenzene	ND	5. µg/L
Bromodichloromethane	ND	5. µg/L	Hexachlorobutadiene	ND	25. µg/L
Bromoform	ND	5. µg/L	2-Hexanone	ND	5. µg/L
Bromomethane	ND	5. µg/L	Iodomethane	ND	5. µg/L
2-Butanone	ND	25. µg/L	Isopropylbenzene	ND	5. µg/L
n-Butylbenzene	ND	5. µg/L	p-Isopropyltoluene	ND	5. µg/L
sec-Butylbenzene	ND	5. µg/L	Methylene chloride (Dichloromethane)	ND	5. µg/L
tert-Butylbenzene	ND	5. µg/L	4-Methyl-2-pentanone	ND	25. µg/L
Carbon disulfide	ND	5. µg/L	MTBE	ND	5. µg/L
Carbon tetrachloride	ND	5. µg/L	Naphthalene	ND	10. µg/L
Chlorobenzene	ND	5. µg/L	n-Propylbenzene	ND	5. µg/L
Chloroethane	ND	5. µg/L	Styrene	ND	5. µg/L
Chloroform	ND	5. µg/L	1,1,1,2-Tetrachloroethane	ND	5. µg/L
Chloromethane	ND	5. µg/L	1,1,2,2-Tetrachloroethane	ND	5. µg/L
2-Chlorotoluene	ND	5. µg/L	Tetrachloroethene (PCE)	ND	5. µg/L
4-Chlorotoluene	ND	5. µg/L	Toluene	ND	5. µg/L
Dibromochloromethane	ND	5. µg/L	1,2,3-Trichlorobenzene	ND	5. µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	5. µg/L	1,2,4-Trichlorobenzene	ND	5. µg/L
1,2-Dibromoethane (EDB)	ND	5. µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5. µg/L
Dibromomethane	ND	5. µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5. µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5. µg/L	Trichloroethene (TCE)	ND	5. µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5. µg/L	Trichlorofluoromethane (Freon 11)	ND	10. µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5. µg/L	1,2,3-Trichloropropane	ND	5. µg/L
Dichlorodifluoromethane (Freon 12)	ND	5. µg/L	1,2,4-Trimethylbenzene	ND	5. µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5. µg/L	1,3,5-Trimethylbenzene	ND	5. µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5. µg/L	Vinyl chloride	ND	5. µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5. µg/L	o-Xylene	ND	5. µg/L
cis-1,2-Dichloroethene	ND	5. µg/L	m,p-Xylene	ND	5. µg/L
trans-1,2-Dichloroethene	ND	5. µg/L			
1,2-Dichloropropane	ND	5. µg/L			
1,3-Dichloropropane	ND	5. µg/L			
2,2-Dichloropropane	ND	10. µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	100	86 - 115
Dibromofluoromethane	94	86 - 118
Toluene-d8	107	88 - 110

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-April/NA
 PROJECT #: NA
 TEST: Volatile Organic Compounds by EPA 8260B, December 1996
 METHOD: EPA 8260
 MATRIX: Aqueous

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000414AQ60_1B-BLK
 ANALYST: BJV - Las Vegas Division
 EXTRACTED: 4/14/00
 ANALYZED: 4/14/00

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25 µg/L	1,1-Dichloropropene	ND	5 µg/L
Benzene	ND	5 µg/L	cis-1,3-Dichloropropene	ND	5 µg/L
Bromobenzene	ND	5 µg/L	trans-1,3-Dichloropropene	ND	5 µg/L
Bromochloromethane	ND	5 µg/L	Ethylbenzene	ND	5 µg/L
Bromodichloromethane	ND	5 µg/L	Hexachlorobutadiene	ND	5 µg/L
Bromoform	ND	5 µg/L	2-Hexanone	ND	25 µg/L
Bromomethane	ND	5 µg/L	Iodomethane	ND	5 µg/L
2-Butanone	ND	25 µg/L	Isopropylbenzene	ND	5 µg/L
n-Butylbenzene	ND	5 µg/L	p-Isopropyltoluene	ND	5 µg/L
sec-Butylbenzene	ND	5 µg/L	Methylene chloride (Dichloromethane)	ND	5 µg/L
tert-Butylbenzene	ND	5 µg/L	4-Methyl-2-pentanone	ND	25 µg/L
Carbon disulfide	ND	5 µg/L	MTBE	ND	5 µg/L
Carbon tetrachloride	ND	5 µg/L	Naphthalene	ND	10 µg/L
Chlorobenzene	ND	5 µg/L	n-Propylbenzene	ND	5 µg/L
Chloroethane	ND	5 µg/L	Styrene	ND	5 µg/L
Chloroform	ND	5 µg/L	1,1,1,2-Tetrachloroethane	ND	5 µg/L
Chloromethane	ND	5 µg/L	1,1,2,2-Tetrachloroethane	ND	5 µg/L
2-Chlorotoluene	ND	5 µg/L	Tetrachloroethene (PCE)	ND	5 µg/L
4-Chlorotoluene	ND	5 µg/L	Toluene	ND	5 µg/L
Dibromochloromethane	ND	5 µg/L	1,2,3-Trichlorobenzene	ND	5 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	5 µg/L	1,2,4-Trichlorobenzene	ND	5 µg/L
1,2-Dibromoethane (EDB)	ND	5 µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5 µg/L
Dibromomethane	ND	5 µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5 µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5 µg/L	Trichloroethene (TCE)	ND	5 µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5 µg/L	Trichlorofluoromethane (Freon 11)	ND	10 µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5 µg/L	1,2,3-Trichloropropane	ND	5 µg/L
Dichlorodifluoromethane (Freon 12)	ND	5 µg/L	1,2,4-Trimethylbenzene	ND	5 µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5 µg/L	1,3,5-Trimethylbenzene	ND	5 µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5 µg/L	Vinyl chloride	ND	5 µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5 µg/L	o-Xylene	ND	5 µg/L
cis-1,2-Dichloroethene	ND	5 µg/L	m,p-Xylene	ND	5 µg/L
trans-1,2-Dichloroethene	ND	5 µg/L			
1,2-Dichloropropane	ND	5 µg/L			
1,3-Dichloropropane	ND	5 µg/L			
2,2-Dichloropropane	ND	10 µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	99	86 - 115
Dibromofluoromethane	92	86 - 118
Toluene-d8	106	88 - 110

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-April/NA
 PROJECT #: NA

CLIENT ID: GWTP-UIC-APRIL
 DATE SAMPLED: 4/10/00
 NEL SAMPLE ID: L0004081-01

TEST: Metals
 MATRIX: Aqueous

ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminum	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Antimony	ND	0.0025 mg/L	5	EPA 6020	4/13/00	4/17/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Barium	0.10	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Boron	0.13	0.1 mg/L	1	EPA 6010	4/12/00	4/12/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Calcium	72	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Chromium	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Copper	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Iron	ND	0.02 mg/L	1	EPA 6010	4/12/00	4/12/00
Lead	ND	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Magnesium	28	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Manganese	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Mercury	ND	0.0002 mg/L	1	EPA 7470A	4/12/00	4/12/00
Nickel	ND	0.04 mg/L	1	EPA 6010	4/12/00	4/12/00
Potassium	5.1	2. mg/L	1	EPA 6010	4/12/00	4/12/00
Selenium	0.0058	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Silver	ND	0.02 mg/L	1	EPA 6010	4/12/00	4/12/00
Sodium	90	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Thallium	ND	0.0025 mg/L	5	EPA 6020	4/13/00	4/17/00
Zinc	ND	0.1 mg/L	1	EPA 6010	4/12/00	4/12/00

D.F. - Dilution Factor

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L04022-Hg-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Mercury	ND	0.0002 mg/L	1	EPA 7470A	4/12/00	4/12/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L04081i-BLK

TEST: Metals

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminum	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Barium	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Boron	ND	0.1 mg/L	1	EPA 6010	4/12/00	4/12/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Calcium	ND	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Chromium	ND	0.01 mg/L	1	EPA 6010	4/12/00	4/12/00
Copper	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Iron	ND	0.02 mg/L	1	EPA 6010	4/12/00	4/12/00
Magnesium	ND	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Manganese	ND	0.005 mg/L	1	EPA 6010	4/12/00	4/12/00
Nickel	ND	0.04 mg/L	1	EPA 6010	4/12/00	4/12/00
Potassium	ND	2. mg/L	1	EPA 6010	4/12/00	4/12/00
Silver	ND	0.02 mg/L	1	EPA 6010	4/12/00	4/12/00
Sodium	ND	0.5 mg/L	1	EPA 6010	4/12/00	4/12/00
Zinc	ND	0.1 mg/L	1	EPA 6010	4/12/00	4/12/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L04081M-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> LIMIT	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Antimony	ND	0.0025 mg/L	5	EPA 6020	4/13/00	4/17/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Lead	ND	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Selenium	ND	0.005 mg/L	5	EPA 6020	4/13/00	4/17/00
Thallium	ND	0.0025 mg/L	5	EPA 6020	4/13/00	4/17/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-April/NA
 PROJECT #: NA

CLIENT ID: GWTP-UIC-APRIL
 DATE SAMPLED: 4/10/00
 NEL SAMPLE ID: L0004081-01

TEST: Inorganic Non-Metals
 MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	120		1	SM 2320 B	mg/L	4/14/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	4/14/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	4/14/00
Alkalinity, Total	120	25.	1	SM 2320 B	mg/L	4/14/00
Chloride	79	25.	250	EPA 300.0	mg/L	4/14/00
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	4/13/00
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	4/14/00
Nitrate, as N	ND	0.5	5	EPA 300.0	mg/L-N	4/10/00
pH	8.15	2.	1	EPA 150.1	pH Units	4/11/00
pH Temperature	23.0	1.	1	EPA 150.1	°C	4/11/00
Sulfate	200	25.	250	EPA 300.0	mg/L	4/14/00
Total Dissolved Solids	556	15.	1	SM 2540 C	mg/L	4/12/00
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	4/14/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000412TDS-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Dissolved Solids	ND	15	1	SM 2540 C	mg/L	4/12/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000413CNW-BLK

TEST: Non-Metals

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	4/13/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000414ALK-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	ND		1	SM 2320 B	mg/L	4/14/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	4/14/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	4/14/00
Alkalinity, Total	ND	25	1	SM 2320 B	mg/L	4/14/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000414F-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	4/14/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000414IC-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Chloride	ND	0.1	1	EPA 300.0	mg/L	4/14/00
Sulfate	ND	0.1	1	EPA 300.0	mg/L	4/14/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC-April/NA
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000414TP-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	4/14/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES
Reno • Las Vegas • Boise
Phoenix • So. California

Las Vegas Division • 4208 Arcata Way, Ste. A • Las Vegas, NV 89030
702-657-1010 • Fax: 702-657-1577 • 888-368-3282

Company: Kerr-McGee Attention: M. Porterfield
Address: P.O. Box 55 Henderson, NV 89009
Phone Number: 651-2200 Fax Number: 651-2310
Billing Address: Expected Due Date: 4/17

Requested Turnaround: 5-day 2-day 1-day Other

Time/Date Sampled: Customer Sample Identification: N.E.L. Identification

4/10/00 1355	GWTP-UIC-APRIL	01

Custody Seal intact? Y N None Temp. 14°C
Condition when received good

CHAIN OF CUSTODY

NEL Work Order: L0004081

Project Name: GWTP-UIC - APRIL Project Number: MARK
Purchase Order Number: Analysis

# of Containers	Matrix (Box #1)	Preservative (Box #2)	Received by (Print)	(Signature)	Date/Time
7	A	X	W Bobick	W Bobick	4-10-00 1415

Box #1	DW - Drinking Water WW - Waste Water OL - Oil/Organic Liquid	Box #2	A. HCl B. HNO ₃ C. H ₂ SO ₄ D. NaOH
	SD - Solid AQ - Aqueous A - Air		E. Ice Only F. Other G. Not Preserved

Relinquished by (Print): Mark Porterfield (Signature): Mark Porterfield Date/Time: 4/10/00 1415
W Bobick (Signature): W Bobick Date/Time: 4-10-00 1545
Brooke Christensen (Signature): Brooke Christensen Date/Time: 4-10-00 1545

The liability of NEL Laboratories Inc. is limited strictly to the price of sample analysis for those samples received in good condition by NEL. NEL is not responsible for loss, damage, resampling costs and/or qualified data related to samples not received in good condition, including adequate sample volume and number of containers. Customer signature of this CoC constitutes a purchase order for NEL to perform work and constitutes acceptance of all NEL Standard Terms and Conditions. Signature also constitutes acceptance of NEL Standard List Prices for all services ordered here on, except those specified otherwise via an NEL Quotation for Testing Services in effect at the time of sample receipt. NEL turnaround times are measured in regular working days. Samples received at the laboratory after 16:30 will be considered received on the next working day. Commitment of laboratory to the requested turnaround time will be confirmed via Sample Confirmation transmitted to the fax number provided above.



MONTGOMERY WATSON LABORATORIES

a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
Report
#64834

Kerr McGee Chemical Company -
Henderson
Mark Porterfield
PO Box 55
Henderson , NV 89009

Samples Received
12-apr-2000 17:02:50

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilut
GWTP-UIC-APRIL (2004120292)				Sampled on 04/10/00				
	04/18/00	114233	(CADHS/EPA314)	Perchlorate	11	ug/l	4.0	1
[REDACTED]				[REDACTED]				
	04/18/00	114233	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	20	5
[REDACTED]				[REDACTED]				
	04/18/00	114233	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	160	40

NEL LABORATORIES

Reno • Las Vegas
Phoenix • So. California

Las Vegas Division
4208 Arcata Way, Suite A • Las Vegas, NV 89030
(702) 657-1010 • Fax: (702) 657-1577
1-888-368-3282

CLIENT: Kerr-McGee Chemical Corporation
8000 West Lake Mead Drive
Henderson, NV 89015
ATTN: Mark Porterfield

PROJECT NAME: GWTP-UIC - MAY
PROJECT NUMBER: NA

NEL ORDER ID: L0005277

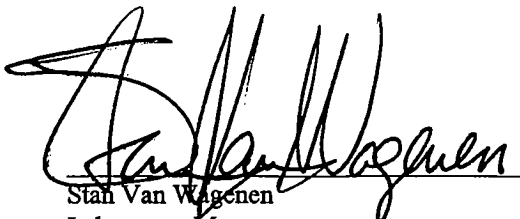
Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 5/26/00.

Should you have any questions or comments, please feel free to contact our Client Services department at (702) 657-1010.

Some QA results have been flagged as follows:

J - This concentration should be considered an estimate due laboratory control sample failure.



Stan Van Wageningen
Laboratory Manager

6/9/00
Date

CERTIFICATIONS:

	<u>Reno</u>	<u>Las Vegas</u>	<u>S. California</u>
Arizona	AZ0520	AZ0518	AZ0605
California	1707	2002	2264
US Army Corps of Engineers	Certified	Certified	

	<u>Reno</u>	<u>Las Vegas</u>	<u>S. California</u>
Idaho	Certified	Certified	
Montana	Certified	Certified	
Nevada	NV033	NV052	CA084
L.A.C.S.D.			10228

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC
 PROJECT #: NA

CLIENT ID: GWTP-UIC-MAY
 DATE SAMPLED: 5/26/00
 NEL SAMPLE ID: L0005277-01

TEST: Volatile Organic Compounds by EPA 8260B, December 1996
 METHOD: EPA 8260
 MATRIX: Aqueous
 DILUTION: 1

EXTRACTED: 6/5/00
 ANALYZED: 6/5/00
 ANALYST: BJV - Las Vegas Division

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25. µg/L	1,1-Dichloropropene	ND	5. µg/L
Benzene	ND	5. µg/L	cis-1,3-Dichloropropene	ND	5. µg/L
Bromobenzene	ND	5. µg/L	trans-1,3-Dichloropropene	ND	5. µg/L
Bromochloromethane	ND	5. µg/L	Ethylbenzene	ND	5. µg/L
Bromodichloromethane	ND	5. µg/L	Hexachlorobutadiene	ND	5. µg/L
Bromoform	ND	5. µg/L	2-Hexanone	ND	25. µg/L
Bromomethane	ND	5. µg/L	Iodomethane	ND	5. µg/L
2-Butanone	ND	25. µg/L	Isopropylbenzene	ND	5. µg/L
n-Butylbenzene	ND	5. µg/L	p-Isopropyltoluene	ND	5. µg/L
sec-Butylbenzene	ND	5. µg/L	Methylene chloride (Dichloromethane)	ND	5. µg/L
tert-Butylbenzene	ND	5. µg/L	4-Methyl-2-pentanone	ND	25. µg/L
Carbon disulfide	ND	5. µg/L	MTBE	ND	5. µg/L
Carbon tetrachloride	ND	5. µg/L	Naphthalene	ND	10. µg/L
Chlorobenzene	ND	5. µg/L	n-Propylbenzene	ND	5. µg/L
Chloroethane	ND	5. µg/L	Styrene	ND	5. µg/L
Chloroform	ND	5. µg/L	1,1,1,2-Tetrachloroethane	ND	5. µg/L
Chloromethane	ND	5. µg/L	1,1,2,2-Tetrachloroethane	ND	5. µg/L
2-Chlorotoluene	ND	5. µg/L	Tetrachloroethene (PCE)	ND	5. µg/L
4-Chlorotoluene	ND	5. µg/L	Toluene	ND	5. µg/L
Dibromochloromethane	ND	5. µg/L	1,2,3-Trichlorobenzene	ND	5. µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	10. µg/L	1,2,4-Trichlorobenzene	ND	5. µg/L
1,2-Dibromoethane (EDB)	ND	5. µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5. µg/L
Dibromomethane	ND	5. µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5. µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5. µg/L	Trichloroethene (TCE)	ND	5. µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5. µg/L	Trichlorofluoromethane (Freon 11)	ND	10. µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5. µg/L	1,2,3-Trichloropropane	ND	5. µg/L
Dichlorodifluoromethane (Freon 12)	ND	5. µg/L	1,2,4-Trimethylbenzene	ND	5. µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5. µg/L	1,3,5-Trimethylbenzene	ND	5. µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5. µg/L	Vinyl chloride	ND	5. µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5. µg/L	o-Xylene	ND	5. µg/L
cis-1,2-Dichloroethene	ND	5. µg/L	m,p-Xylene	ND	10. µg/L
trans-1,2-Dichloroethene	ND	5. µg/L			
1,2-Dichloropropane	ND	5. µg/L			
1,3-Dichloropropane	ND	5. µg/L			
2,2-Dichloropropane	ND	10. µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	99	83 - 112
Dibromofluoromethane	96	84 - 109
Toluene-d8	101	88 - 113

ND: Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC
 PROJECT #: NA
 TEST: Volatile Organic Compounds by EPA 8260B, December 1996
 METHOD: EPA 8260
 MATRIX: Aqueous

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000605AQ60_1A2-BLK
 ANALYST: BJV - Las Vegas Division
 EXTRACTED: 6/5/00
 ANALYZED: 6/5/00

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25 µg/L	1,1-Dichloropropene	ND	5 µg/L
Benzene	ND	5 µg/L	cis-1,3-Dichloropropene	ND	5 µg/L
Bromobenzene	ND	5 µg/L	trans-1,3-Dichloropropene	ND	5 µg/L
Bromochloromethane	ND	5 µg/L	Ethylbenzene	ND	5 µg/L
Bromodichloromethane	ND	5 µg/L	Hexachlorobutadiene	ND	5 µg/L
Bromoform	ND	5 µg/L	2-Hexanone	ND	25 µg/L
Bromomethane	ND	5 µg/L	Iodomethane	ND	5 µg/L
2-Butanone	ND	25 µg/L	Isopropylbenzene	ND	5 µg/L
n-Butylbenzene	ND	5 µg/L	p-Isopropyltoluene	ND	5 µg/L
sec-Butylbenzene	ND	5 µg/L	Methylene chloride (Dichloromethane)	ND	5 µg/L
tert-Butylbenzene	ND	5 µg/L	4-Methyl-2-pentanone	ND	25 µg/L
Carbon disulfide	ND	5 µg/L	MTBE	ND	5 µg/L
Carbon tetrachloride	ND	5 µg/L	Naphthalene	ND	10 µg/L
Chlorobenzene	ND	5 µg/L	n-Propylbenzene	ND	5 µg/L
Chloroethane	ND	5 µg/L	Styrene	ND	5 µg/L
Chloroform	ND	5 µg/L	1,1,1,2-Tetrachloroethane	ND	5 µg/L
Chloromethane	ND	5 µg/L	1,1,2,2-Tetrachloroethane	ND	5 µg/L
2-Chlorotoluene	ND	5 µg/L	Tetrachloroethene (PCE)	ND	5 µg/L
4-Chlorotoluene	ND	5 µg/L	Toluene	ND	5 µg/L
Dibromochloromethane	ND	5 µg/L	1,2,3-Trichlorobenzene	ND	5 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	10 µg/L	1,2,4-Trichlorobenzene	ND	5 µg/L
1,2-Dibromoethane (EDB)	ND	5 µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5 µg/L
Dibromomethane	ND	5 µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5 µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5 µg/L	Trichloroethene (TCE)	ND	5 µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5 µg/L	Trichlorofluoromethane (Freon 11)	ND	10 µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5 µg/L	1,2,3-Trichloropropane	ND	5 µg/L
Dichlorodifluoromethane (Freon 12)	ND	5 µg/L	1,2,4-Trimethylbenzene	ND	5 µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5 µg/L	1,3,5-Trimethylbenzene	ND	5 µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5 µg/L	Vinyl chloride	ND	5 µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5 µg/L	o-Xylene	ND	5 µg/L
cis-1,2-Dichloroethene	ND	5 µg/L	m,p-Xylene	ND	10 µg/L
trans-1,2-Dichloroethene	ND	5 µg/L			
1,2-Dichloropropane	ND	5 µg/L			
1,3-Dichloropropane	ND	5 µg/L			
2,2-Dichloropropane	ND	10 µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	101	83 - 112
Dibromofluoromethane	98	84 - 109
Toluene-d8	102	88 - 113

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC
 PROJECT #: NA

CLIENT ID: GWTP-UIC-MAY
 DATE SAMPLED: 5/26/00
 NEL SAMPLE ID: L0005277-01

TEST: Metals
 MATRIX: Aqueous

ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminium	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Antimony	ND	0.0025 mg/L	5	EPA 6020	6/1/00	6/3/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Barium	0.10	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Boron	0.12	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Calcium	72	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Chromium	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Copper	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Iron	0.18	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00
Lead	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Magnesium	26	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Manganese	0.021	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Mercury	ND	0.0002 mg/L	1	EPA 7470A	6/1/00	6/1/00
Nickel	ND	0.04 mg/L	1	EPA 6010	6/1/00	6/2/00
Potassium	4.6	2. mg/L	1	EPA 6010	6/1/00	6/2/00
Selenium	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Silver	ND	0.02 mg/L	1	EPA 6010	6/1/00	6/2/00
Sodium	81	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Thallium	ND	0.0025 mg/L	5	EPA 6020	6/1/00	6/3/00
Zinc	ND	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00

D.F. - Dilution Factor

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L05256-Hg-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Mercury	ND	0.0002 mg/L	1	EPA 7470A	6/1/00	6/1/00

D.F. - Dilution Factor

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L05277i-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminum	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Barium	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Boron	ND	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Calcium	ND	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Chromium	ND	0.01 mg/L	1	EPA 6010	6/1/00	6/2/00
Copper	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Iron	ND	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00
Magnesium	ND	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Manganese	ND	0.005 mg/L	1	EPA 6010	6/1/00	6/2/00
Nickel	ND	0.04 mg/L	1	EPA 6010	6/1/00	6/2/00
Potassium	ND	2. mg/L	1	EPA 6010	6/1/00	6/2/00
Silver	ND	0.02 mg/L	1	EPA 6010	6/1/00	6/2/00
Sodium	ND	0.5 mg/L	1	EPA 6010	6/1/00	6/2/00
Zinc	ND	0.1 mg/L	1	EPA 6010	6/1/00	6/2/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: L05277M-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Antimony	ND	0.0025 mg/L	5	EPA 6020	6/1/00	6/3/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Lead	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Selenium	ND	0.005 mg/L	5	EPA 6020	6/1/00	6/3/00
Thallium	ND	0.0025 mg/L	5	EPA 6020	6/1/00	6/3/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC
 PROJECT #: NA

CLIENT ID: GWTP-UIC-MAY
 DATE SAMPLED: 5/26/00
 NEL SAMPLE ID: L0005277-01

TEST: Inorganic Non-Metals
 MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	130		1	SM 2320 B	mg/L	5/27/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	5/27/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	5/27/00
Alkalinity, Total	130	25.	1	SM 2320 B	mg/L	5/27/00
Chloride	600	25.	250	EPA 300.0	mg/L	6/3/00
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	6/2/00
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	5/31/00
Nitrate, as N	0.55	0.5	5	EPA 300.0	mg/L-N	5/27/00
pH	8.09	2.	1	EPA 150.1	pH Units	5/27/00
pH Temperature	25.6	1.	1	EPA 150.1	°C	5/27/00
Sulfate	1800	25.	250	EPA 300.0	mg/L	6/3/00
Total Dissolved Solids	581	15.	1	SM 2540 C	mg/L	5/30/00
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	6/2/00

D.F. = Dilution Factor

ND = Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000527ALK-BLK

TEST: Non-Metals

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	ND		1	SM 2320 B	mg/L	5/27/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	5/27/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	5/27/00
Alkalinity, Total	ND	25	1	SM 2320 B	mg/L	5/27/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000527IC-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Nitrate, as N	ND	0.1	1	EPA 300.0	mg/L-N	5/27/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000530TDS2-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Dissolved Solids	ND	15	1	SM 2540 C	mg/L	5/30/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000531F-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	5/31/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000602CNW-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	6/2/00

D.F. - Dilution Factor

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000602TP-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	6/2/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: GWTP-UIC
PROJECT #: NA
TEST: Non-Metals

CLIENT ID: Method Blank
DATE SAMPLED: NA
NEL SAMPLE ID: 000603IC-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Chloride	ND	0.1	1	EPA 300.0	mg/L	6/3/00
Sulfate	ND	0.1	1	EPA 300.0	mg/L	6/3/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES
 Reno • Las Vegas • Boise
 Phoenix • So. California

Las Vegas Division • 4208 Arcata Way, Ste. A • Las Vegas, NV 89030
 702-657-1010 • Fax: 702-657-1577 • 888-368-3282

Company: Kew-McGee Attention: M. Porterfield
 Address: P.O. Box 55 Henderson, NV 89009
 Phone Number: _____ Fax Number: _____

Billing Address: _____
 Expected Due Date: 6/5

Requested Turnaround: X 5-day ___ 2-day ___ 1-day ___ Other ___

Time/Date Sampled: _____ Customer Sample Identification: GWTP-VIC-MAY N.E.L. Identification: 01

Custody Seal intact? Y N None Temp. 90
 Condition when received good

CHAIN OF CUSTODY

NEL Work Order: LO005277

Project Name: GWTP-VIC Project Number: _____
 Purchase Order Number: _____ Sampled By: Mark

# of Containers	Matrix (Box #1)	Preservative (Box #2)	Analysis	Remarks
7	X	X	Profile I 8260	

Box #1: DW - Drinking Water, WW - Waste Water, OL - Oil/Organic Liquid
 SD - Solid, AQ - Aqueous, A - Air
 Box #2: A. HCl, B. HNO₃, C. H₂SO₄, D. NaOH, E. Ice Only, F. Other, G. Not Preserved

Relinquished By (Print)	(Signature)	Date/Time	Received by (Print)	(Signature)	Date/Time
1. <u>Mark Porterfield</u>	<u>[Signature]</u>	<u>5/26/00 1515</u>	<u>Bob Lick</u>	<u>[Signature]</u>	<u>5-26-00 1515</u>
2. <u>Profile I</u>	<u>[Signature]</u>	<u>5-26-00 1715</u>	<u>B. Christensen</u>	<u>[Signature]</u>	<u>5/26/00 1715</u>
3. _____	_____	_____	_____	_____	_____

The liability of NEL Laboratories Inc. is limited strictly to the price of sample analysis for those samples received in good condition by NEL. NEL is not responsible for loss, damage, resampling costs and/or qualified data related to samples not received in good condition, including adequate sample volume and number of containers. Customer signature of this CoC constitutes a purchase order for NEL to perform work and constitutes acceptance of all NEL Standard Terms and Conditions. Signature also constitutes acceptance of NEL Standard List Prices for all services ordered here on, except those specified otherwise via an NEL Quotation for Testing Services in effect at the time of sample receipt. NEL turnaround times are measured in regular working days. Samples received at the laboratory after 16:30 will be considered received on the next working day. Commitment of laboratory to the requested turnaround time will be confirmed via Sample Confirmation transmitted to the fax number provided above.



MONTGOMERY WATSON LABORATORIES

a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
Data Report
#66564

Kerr McGee Chemical Company -
Henderson
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilut
GWTP-UIC-MAY (2006010123)				Sampled on	05/26/00	12:00		
06/08/00	12:00	117343	(CADHS/EPA314)	Perchlorate	20	ug/l	4.0	1

NEL LABORATORIES

Reno • Las Vegas
Phoenix • So. California

Las Vegas Division
4200 Arcata Way, Suite A • Las Vegas, NV 89030
(702) 657-1010 • Fax: (702) 657-1577
1-888-368-3282

CLIENT: Kerr-McGee Chemical Corporation
8000 West Lake Mead Drive
Henderson, NV 89015
ATTN: Mark Porterfield

PROJECT NAME: GWTP-UIC-June/NA
PROJECT NUMBER: NA

NEL ORDER ID: L0006325

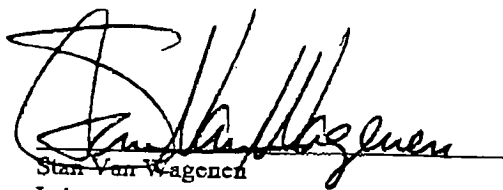
Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 6/28/00.

Should you have any questions or comments, please feel free to contact our Client Services department at (702) 657-1010.

Some QA results have been flagged as follows:

C - Sample concentration is a least 5 times greater than spike contribution. Spike recovery criteria do not apply.


Stan Van Wageningen
Laboratory Manager

7/18/00
Date

CERTIFICATIONS:

	Reno	Las Vegas	S. California		Reno	Las Vegas	S. California
Arizona	AZ0520	AZ0518	AZ0605	Idaho	Certified	Certified	
California	1707	2002	2264	Montana	Certified	Certified	
US Army Corps of Engineers	Certified	Certified		Nevada	NV033	NV052	CA084
				L.A.C.S.D.			10228

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA

CLIENT ID: GWTP-UIC-JUNE
 DATE SAMPLED: 6/28/00
 NEL SAMPLE ID: L0006325-01

TEST: Volatile Organic Compounds by EPA 8260B, December 1996

METHOD: EPA 8260

EXTRACTED: 7/6/00

MATRIX: Aqueous

ANALYZED: 7/6/00

DILUTION: 1

ANALYST: BJV - Las Vegas Division

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25. µg/L	1,1-Dichloropropene	ND	5. µg/L
Benzene	ND	5. µg/L	cis-1,3-Dichloropropene	ND	5. µg/L
Bromobenzene	ND	5. µg/L	trans-1,3-Dichloropropene	ND	5. µg/L
Bromochloromethane	ND	5. µg/L	Ethylbenzene	ND	5. µg/L
Bromodichloromethane	ND	5. µg/L	Hexachlorobutadiene	ND	5. µg/L
Bromoform	ND	5. µg/L	2-Hexanone	ND	25. µg/L
Bromomethane	ND	5. µg/L	Iodomethane	ND	5. µg/L
2-Butanone	ND	25. µg/L	Isopropylbenzene	ND	5. µg/L
n-Butylbenzene	ND	5. µg/L	p-Isopropyltoluene	ND	5. µg/L
sec-Butylbenzene	ND	5. µg/L	Methylene chloride (Dichloromethane)	ND	5. µg/L
tert-Butylbenzene	ND	5. µg/L	4-Methyl-2-pentanone	ND	25. µg/L
Carbon disulfide	ND	5. µg/L	MTBE	ND	5. µg/L
Carbon tetrachloride	ND	5. µg/L	Naphthalene	ND	10. µg/L
Chlorobenzene	ND	5. µg/L	n-Propylbenzene	ND	5. µg/L
Chloroethane	ND	5. µg/L	Styrene	ND	5. µg/L
Chloroform	ND	5. µg/L	1,1,1,2-Tetrachloroethane	ND	5. µg/L
Chloromethane	ND	5. µg/L	1,1,2,2-Tetrachloroethane	ND	5. µg/L
2-Chlorotoluene	ND	5. µg/L	Tetrachloroethene (PCE)	ND	5. µg/L
4-Chlorotoluene	ND	5. µg/L	Toluene	ND	5. µg/L
Dibromochloromethane	ND	5. µg/L	1,2,3-Trichlorobenzene	ND	5. µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	10. µg/L	1,2,4-Trichlorobenzene	ND	5. µg/L
1,2-Dibromoethane (EDB)	ND	5. µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5. µg/L
Dibromomethane	ND	5. µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5. µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5. µg/L	Trichloroethene (TCE)	ND	5. µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5. µg/L	Trichlorofluoromethane (Freon 11)	ND	10. µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5. µg/L	1,2,3-Trichloropropane	ND	5. µg/L
Dichlorodifluoromethane (Freon 12)	ND	5. µg/L	1,2,4-Trimethylbenzene	ND	5. µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5. µg/L	1,3,5-Trimethylbenzene	ND	5. µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5. µg/L	Vinyl chloride	ND	5. µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5. µg/L	o-Xylene	ND	5. µg/L
cis-1,2-Dichloroethene	ND	5. µg/L	m,p-Xylene	ND	10. µg/L
trans-1,2-Dichloroethene	ND	5. µg/L			
1,2-Dichloropropane	ND	5. µg/L			
1,3-Dichloropropane	ND	5. µg/L			
1,2-Dichloropropane	ND	10. µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
m-Bromofluorobenzene	97	83 - 112
Dibromofluoromethane	96	84 - 109
Toluene-d8	99	88 - 113

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Volatile Organic Compounds by EPA 8260B, December 1996
 METHOD: EPA 8260
 MATRIX: Aqueous

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000706AQ60_1A-BLK
 ANALYST: BJV - Las Vegas Division
 EXTRACTED: 7/6/00
 ANALYZED: 7/6/00

PARAMETER	Result µg/L	Reporting Limit	PARAMETER	Result µg/L	Reporting Limit
Acetone	ND	25 µg/L	1,1-Dichloropropene	ND	5 µg/L
Benzene	ND	5 µg/L	cis-1,3-Dichloropropene	ND	5 µg/L
Bromobenzene	ND	5 µg/L	trans-1,3-Dichloropropene	ND	5 µg/L
Bromochloromethane	ND	5 µg/L	Ethylbenzene	ND	5 µg/L
Bromodichloromethane	ND	5 µg/L	Hexachlorobutadiene	ND	5 µg/L
Bromoform	ND	5 µg/L	2-Hexanone	ND	25 µg/L
Bromomethane	ND	5 µg/L	Iodomethane	ND	5 µg/L
2-Butanone	ND	25 µg/L	Isopropylbenzene	ND	5 µg/L
n-Butylbenzene	ND	5 µg/L	p-Isopropyltoluene	ND	5 µg/L
sec-Butylbenzene	ND	5 µg/L	Methylene chloride (Dichloromethane)	ND	5 µg/L
tert-Butylbenzene	ND	5 µg/L	4-Methyl-2-pentanone	ND	25 µg/L
Carbon disulfide	ND	5 µg/L	MTBE	ND	5 µg/L
Carbon tetrachloride	ND	5 µg/L	Naphthalene	ND	10 µg/L
Chlorobenzene	ND	5 µg/L	n-Propylbenzene	ND	5 µg/L
Chloroethane	ND	5 µg/L	Styrene	ND	5 µg/L
Chloroform	ND	5 µg/L	1,1,1,2-Tetrachloroethane	ND	5 µg/L
Chloromethane	ND	5 µg/L	1,1,2,2-Tetrachloroethane	ND	5 µg/L
2-Chlorotoluene	ND	5 µg/L	Tetrachloroethene (PCE)	ND	5 µg/L
4-Chlorotoluene	ND	5 µg/L	Toluene	ND	5 µg/L
Dibromochloromethane	ND	5 µg/L	1,2,3-Trichlorobenzene	ND	5 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	10 µg/L	1,2,4-Trichlorobenzene	ND	5 µg/L
1,2-Dibromoethane (EDB)	ND	5 µg/L	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5 µg/L
Dibromomethane	ND	5 µg/L	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5 µg/L
1,2-Dichlorobenzene (o-DCB)	ND	5 µg/L	Trichloroethene (TCE)	ND	5 µg/L
1,3-Dichlorobenzene (m-DCB)	ND	5 µg/L	Trichlorofluoromethane (Freon 11)	ND	10 µg/L
1,4-Dichlorobenzene (p-DCB)	ND	5 µg/L	1,2,3-Trichloropropane	ND	5 µg/L
Dichlorodifluoromethane (Freon 12)	ND	5 µg/L	1,2,4-Trimethylbenzene	ND	5 µg/L
1,1-Dichloroethane (1,1-DCA)	ND	5 µg/L	1,3,5-Trimethylbenzene	ND	5 µg/L
1,2-Dichloroethane (1,2-DCA)	ND	5 µg/L	Vinyl chloride	ND	5 µg/L
1,1-Dichloroethene (1,1-DCE)	ND	5 µg/L	o-Xylene	ND	5 µg/L
1,2-Dichloroethene	ND	5 µg/L	m,p-Xylene	ND	10 µg/L
trans-1,2-Dichloroethene	ND	5 µg/L			
1,2-Dichloropropane	ND	5 µg/L			
1,3-Dichloropropane	ND	5 µg/L			
1,2-Dichloropropane	ND	10 µg/L			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
1-Bromofluorobenzene	99	83 - 112
1-Bromofluoromethane	96	84 - 109
1-Toluene-d8	100	88 - 113

D - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA

CLIENT ID: GWTP-UIC-JUNE
 DATE SAMPLED: 6/28/00
 NEL SAMPLE ID: L0006325-01

TEST: Metals
 MATRIX: Aqueous

ANALYST: JY - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminum	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Antimony	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Barium	0.12	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Boron	0.14	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Calcium	79	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Chromium	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Copper	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Iron	ND	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00
Lead	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Magnesium	28	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Manganese	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Mercury	ND	0.0002 mg/L	1	EPA 7470A	7/3/00	7/3/00
Nickel	ND	0.04 mg/L	1	EPA 6010	6/30/00	7/8/00
Potassium	4.8	2. mg/L	1	EPA 6010	6/30/00	7/8/00
Selenium	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Silver	ND	0.02 mg/L	1	EPA 6010	6/30/00	7/8/00
Sodium	89	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Thallium	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Zinc	ND	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00

F - Dilution Factor

D - Not Detected

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NEL LABORATORIES

CLIENT:	Kerr-McGee Chemical Corporation	CLIENT ID:	Method Blank
PROJECT ID:	GWTP-UIC-Junc/NA	DATE SAMPLED:	NA
PROJECT #:	NA	NEL SAMPLE ID:	L06325-Hg-BLK
TEST:	Metals		

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Mercury	ND	0.0002 mg/L	1	EPA 7470A	7/3/00	7/3/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: L06325i-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Aluminum	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Barium	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Beryllium	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Boron	ND	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Calcium	ND	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Chromium	ND	0.01 mg/L	1	EPA 6010	6/30/00	7/8/00
Copper	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Iron	ND	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00
Magnesium	ND	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Manganese	ND	0.005 mg/L	1	EPA 6010	6/30/00	7/8/00
Nickel	ND	0.04 mg/L	1	EPA 6010	6/30/00	7/8/00
Potassium	ND	2. mg/L	1	EPA 6010	6/30/00	7/8/00
Silver	ND	0.02 mg/L	1	EPA 6010	6/30/00	7/8/00
Sodium	ND	0.5 mg/L	1	EPA 6010	6/30/00	7/8/00
Zinc	ND	0.1 mg/L	1	EPA 6010	6/30/00	7/8/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: R06098M-BLK

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Antimony	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Arsenic	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Lead	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Selenium	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00
Thallium	ND	0.005 mg/L	5	EPA 6020	7/5/00	7/11/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA

CLIENT ID: GWTP-UIC-JUNE
 DATE SAMPLED: 6/28/00
 NEL SAMPLE ID: L0006325-01

TEST: Inorganic Non-Metals
 MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	120		1	SM 2320 B	mg/L	6/30/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	6/30/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	6/30/00
Alkalinity, Total	120	25.	1	SM 2320 B	mg/L	6/30/00
Chloride	61	5.	50	EPA 300.0	mg/L	7/3/00
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	6/29/00
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	7/3/00
Nitrate, as N	ND	1.	10	EPA 300.0	mg/L-N	6/28/00
pH	8.09	2.	1	EPA 150.1	pH Units	6/28/00
pH Temperature	24.4	1.	1	EPA 150.1	°C	6/28/00
Sulfate	200	5.	50	EPA 300.0	mg/L	7/3/00
Total Dissolved Solids	569	15.	1	SM 2540 C	mg/L	6/30/00
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	6/29/00

.F. - Dilution Factor

D - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Non-Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000628IC-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Nitrate, as N	ND	0.1	1	EPA 300.0	mg/L-N	6/28/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation

CLIENT ID: Method Blank

PROJECT ID: GWTP-UIC-June/NA

DATE SAMPLED: NA

PROJECT #: NA

NEL SAMPLE ID: 000629CNW-BLK

TEST: Non-Metals

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Cyanide, WAD	ND	0.02	1	SM 4500-CN I	mg/L	6/29/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Non-Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000629TP-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Phosphorus	ND	0.01	1	SM 4500-P E	mg/L-P	6/29/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Non-Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000630ALK2-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Alkalinity - Bicarbonate	ND		1	SM 2320 B	mg/L	6/30/00
Alkalinity - Carbonate	ND		1	SM 2320 B	mg/L	6/30/00
Alkalinity - Hydroxide	ND		1	SM 2320 B	mg/L	6/30/00
Alkalinity, Total	ND	25	1	SM 2320 B	mg/L	6/30/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
 PROJECT ID: GWTP-UIC-June/NA
 PROJECT #: NA
 TEST: Non-Metals

CLIENT ID: Method Blank
 DATE SAMPLED: NA
 NEL SAMPLE ID: 000630TDS-BLK

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Dissolved Solids	ND	15	1	SM 2540 C	mg/L	6/30/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT:	Kerr-McGee Chemical Corporation	CLIENT ID:	Method Blank
PROJECT ID:	GWTP-UIC-June/NA	DATE SAMPLED:	NA
PROJECT #:	NA	NEL SAMPLE ID:	000703F-BLK
TEST:	Non-Metals		

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Fluoride	ND	0.4	1	SM 4500-F C	mg/L	7/3/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT:	Kerr-McGee Chemical Corporation	CLIENT ID:	Method Blank
PROJECT ID:	GWTP-UIC-June/NA	DATE SAMPLED:	NA
PROJECT #:	NA	NEL SAMPLE ID:	000703IC-BLK
TEST:	Non-Metals		

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Chloride	ND	0.1	1	EPA 300.0	mg/L	7/3/00
Sulfate	ND	0.1	1	EPA 300.0	mg/L	7/3/00

D.F. - Dilution Factor

ND - Not Detected

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Las Vegas Division • 4208 Arcata Way, Ste. A • Las Vegas, NV 89030
702-657-1010 • Fax: 702-657-1577 • 888-368-3282

Company: Kerr-McGee Attention: M. Porterfield
Address: P.O. Box 55
Hender son, NV 89009
Phone Number: 651-22200 Fax Number: 651-2310
Billing Address: _____
Expected Due Date: APR

Requested Turnaround: 5-day 2-day 1-day Other

Time/Date Sampled: 6/26/00 Customer Sample Identification: GWTP-MIC-JUNE N.E.L. Identification: 01

Time/Date Sampled	Customer Sample Identification	N.E.L. Identification	# of Containers	Matrix (Box #1)	Preservative (Box #2)	Analysis	Remarks	Box #1		Box #2	
								DW - Drinking Water	SD - Solid	WW - Waste Water	AQ - Aqueous
6/26/00	GWTP-MIC-JUNE	01	7	A0	X	Drinking Water					
6											

Custody Seal intact? Yes None Temp. 17C
Condition when received: Good

Relinquished by (Print)	(Signature)	Date/Time	Received by (Print)	(Signature)	Date/Time
Mark Porterfield	<i>M. Porterfield</i>	6-29-00 1430	Bob Lick	<i>Bob Lick</i>	6-28-00 1430
Bob Lick	<i>Bob Lick</i>	6-28-00 1555	J. Sanchez	<i>J. Sanchez</i>	6-28-00/1555

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MONTGOMERY WATSON LABORATORIES

a Division of Montgomery Watson Americas, Inc.
 555 East Walnut Street
 Pasadena, California 91101
 Tel: 626 568 8400 Fax: 626 588 6324
 1 800 566 LABS (1 800 566 5227)

Laboratory
 Report
 #67562

Kerr McGee Chemical Company -
 Henderson
 (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilu
M-38 (2006300115)	07/07/00	119395	(CADHS/EPA314)	Perchlorate	Sampled on 06/26/00	██████████	200000	5000
						ug/l		
M-89 (2006300116)	07/07/00	119395	(CADHS/EPA314)	Perchlorate	Sampled on 06/26/00	██████████	200000	5000
						ug/l		
001 OUTFALL (2006300117)	07/07/00	119395	(CADHS/EPA314)	Perchlorate	Sampled on 06/23/00	██████████	4.0	1
						ug/l		
002 OUTFALL (2006300118)	07/11/00	119520	(CADHS/EPA314)	Perchlorate	Sampled on 06/26/00	██████████	80	20
						ug/l		
GWTP-UIC-JUNE (2006300119)	07/11/00	119520	(CADHS/EPA314)	Perchlorate	Sampled on 06/29/00	8.5	4.0	1
						ug/l		

ATTACHMENT 2

**UIC Permit
Monitoring**

-

Water Elevations

Analytical Information

Flow Rates

KERR-McGEE CHEMICAL LLC
Henderson, Nevada Facility

UIC PERMIT MONITORING WELLS
QUARTERLY GROUNDWATER ELEVATIONS (feet)

Date	M-25		M-38		M-80		M-82A		M-86		M-94		M-96		M-98		M-99		M-100		M-102	
	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV	TOC	ELEV
Jan-99	33.30	1728.63	30.90	1728.63	30.90	1715.14	23.20	1717.01	25.20	1719.03	10.00	1685.07	8.40	1685.09	25.80	1706.11	25.68	1705.06	24.08	1706.85	29.90	1710.34
Feb-99	33.35	1726.58	30.94	1728.79	30.50	1715.54	23.00	1717.21	25.00	1719.23	9.87	1685.20	8.29	1685.20	25.80	1706.11	25.65	1705.09	24.14	1706.79	30.00	1710.24
Mar-99	33.40	1726.53	31.00	1728.73	31.95	1714.09	24.29	1715.92	27.00	1717.23	9.80	1688.34	8.29	1685.20	26.22	1705.69	25.98	1704.76	24.57	1706.36	30.75	1709.49
May-99	33.40	1726.53	30.95	1728.78	32.56	1713.48	24.72	1715.49	27.88	1716.35	8.73	1689.41	8.16	1685.33	27.00	1705.51	26.29	1704.45	24.85	1706.08	31.06	1709.18
Aug-99	33.76	1726.17	31.31	1728.42	33.05	1712.99	25.4	1714.81	28.78	1715.45	9.90	1688.24	8.31	1685.18	28.68	1705.19	27.34	1703.5	25.75	1705.18	31.7	1708.54
Nov-99	34	1725.93	34.41	1725.32	31.6	1714.44	25.78	1714.43	29.62	1714.61	10.4	1687.74	8.73	1684.76	29.58	1704.29	27.96	1702.88	26.37	1704.56	32.31	1707.93
Feb-00	33.7	1726.23	31.31	1728.63	33.75	1712.29	25.64	1714.57	30.51	1713.72	10.71	1687.43	9.11	1684.38	30.75	1703.12	28.99	1701.85	27.33	1703.60	33.02	1707.22
May-00	33.53	1724.29	31.30	1726.64	33.60	1712.13	25.53	1712.82	30.80	1711.93	10.18	1687.96	9.20	1684.29	31.24	1700.67	29.57	1701.17	27.86	1703.07	33.51	1706.73

KERR-McGEE CHEMICAL LLC
Henderson, Nevada Facility

UIC PERMIT MONITORING WELLS
TOTAL DISSOLVED SOLIDS (mg/l) ANALYSES

Date	M-11	M-12A	M-84	M-36	M-37	M-44	M-94	M-100
2-1-99	6,200	18,700	NA	15,900	18,800	11,800	12,000	11,000
5-3-99	6,430	17,600	11,200	20,200	15,300	13,100	11,800	11,400
8-9-99	4,960	20,000	11,040	13,300	10,900	11,600	11,600	16,900
11-8-99	4,570	15,800	10,700	20,100	19,100	12,200	11,600	7,310
2-2-00	4,280	15,100	6,320	16,600	13,200	11,200	12,000	8,270
5-1-00	4,270	18,00	12,600	18,600	16,00	13,600	12,900	8,620

NA – Not analyzed, monitoring began in 2nd quarter 1999.

**KERR-McGEE CHEMICAL LLC
Henderson, Nevada Facility**

**UIC PERMIT MONITORING WELLS
TOTAL PERCHLORATE (mg/l) ANALYSES**

Date	M-11	M-12A	M-84	M-36	M-37	M-44	M-94	M-100
2-1-99	250	3,000	1,300	3,000	14,000	1,700	2,000	1,400
5-3-99	115	2300	1,200	2,800	12,600	1,200	1,600	1,300
8-9-99	64	2,100	1,500	2,900	3,800	1,600	2,100	120
11-8-99	71	1,500	1,300	2,900	13,000	1,600	1,600	1,100
2-2-00	62	1,400	1,200	3,000	10,000	1,600	1,700	890
5-1-00	72	160	1,300	3,500	9,900	2,000	2,00	990

**KERR-McGEE CHEMICAL LLC
Henderson, Nevada Facility**

**UIC PERMIT
INJECTION AND EXTRACTION RATES (gpm)**

MONTH	EXTRATION RATE	INJECTION RATE
January 1999	59	25
February	54	25
March	45	25
April	51	18
May	42	18
June	24	20
July	27	23
August	29	24
September	26	23
October	26	26
November	26	25
December 1999	26	24
January 2000	34	28
February	34	28
March	34	28
April	34	25
May	35	25
June	34	25

NEL LABORATORIE

Kerr-McGee Chemical Corporation

Annual - 00

NA

Metals

Aqueous

CLIENT ID: M-11

DATE SAMPLED: 5/3/00

NEL SAMPLE ID: L0005045-11

ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	7.2	0.01 mg/L	1	EPA 6010	5/4/00	5/10/00
Hexavalent Chromium	5.7	1. mg/L	100	SM 3500-Cr D	5/4/00	5/4/00

D.F. Dilution Factor

ND - Not Detected

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NEL LABORATORIES

Kerr-McGee Chemical Corporation

CLIENT ID: M-11

PROJECT ID: Annual - 00

DATE SAMPLED: 5/3/00

PROJECT #: NA

NEL SAMPLE ID: L0005045-11

Inorganic Non-Metals

MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	8.08	2.	1	EPA 150.1	pH Units	5/4/00
pH Temperature	23.8	1.	1	EPA 150.1	°C	5/4/00
Specific Conductance	5480	1.	1	SM 2510 B	µS/cm	5/5/00
Total Dissolved Solids	4270	60.	4	SM 2540 C	mg/L	5/4/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

Kerr-McGee Chemical Corporation

CLIENT ID: M-12

DATE SAMPLED: 5/3/00

NEL SAMPLE ID: L0005045-12

Annual - 00

NA

Metals

ANALYST: JF - Reno Division

Aqueous

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	49	0.01 mg/L	1	EPA 6010	5/4/00	5/10/00
Hexavalent Chromium	40	1. mg/L	100	SM 3500-Cr D	5/4/00	5/4/00

D.F. Dilution Factor

ND. Not Detected

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NEL LABORATORIES

Kerr-McGee Chemical Corporation

CLIENT ID: M-12

PROJECT ID: Annual - 00

DATE SAMPLED: 5/3/00

PROJECT #: NA

NEL SAMPLE ID: L0005045-12

Inorganic Non-Metals

MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	7.79	2.	1	EPA 150.1	pH Units	5/4/00
pH Temperature	22.6	1.	1	EPA 150.1	°C	5/4/00
Specific Conductance	19100	1.	1	SM 2510 B	µS/cm	5/5/00
Total Dissolved Solids	18000	300.	20	SM 2540 C	mg/L	5/4/00

DF - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT ID: Kerr-McGee Chemical Corporation
PROJECT ID: Annual - 00
PROJECT #: NA
TEST: Metals
MATRIX: Aqueous

CLIENT ID: M-36
DATE SAMPLED: 5/2/00
NEL SAMPLE ID: L0005029-03

ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	29	0.1 mg/L	10	EPA 6010	5/3/00	5/9/00
Hexavalent Chromium	32	1. mg/L	100	SM 3500-Cr D	5/3/00	5/3/00
Manganese	0.46	0.05 mg/L	10	EPA 6010	5/3/00	5/9/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: Annual - 00
PROJECT #: NA
TEST: Inorganic Non-Metals
MATRIX: Aqueous

CLIENT ID: M-36
DATE SAMPLED: 5/2/00
NEL SAMPLE ID: L0005029-03

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	7.35	2.	1	EPA 150.1	pH Units	5/2/00
pH Temperature	21.9	1.	1	EPA 150.1	°C	5/2/00
Specific Conductance	20000	1.	1	SM 2510 B	µS/cm	5/3/00
Total Dissolved Solids	18600	300.	20	SM 2540 C	mg/L	5/3/00

D.F. Dilution Factor

ND Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: Annual - 00
PROJECT #: NA
TEST: Metals
MATRIX: Aqueous

CLIENT ID: M-37
DATE SAMPLED: 5/1/00
NEL SAMPLE ID: L0005010-04
ANALYST: JY - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	0.075	0.01 mg/L	1	EPA 6010	5/3/00	5/5/00
Hexavalent Chromium	0.094 JI	0.01 mg/L	1	SM 3500-Cr D	5/2/00	5/2/00

DF: Dilution Factor

ND: Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: Annual - 00
PROJECT #: NA

CLIENT ID: M-37
DATE SAMPLED: 5/1/00
NEL SAMPLE ID: L0005010-04

TEST: Inorganic Non-Metals
MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	6.98	2.	1	EPA 150.1	pH Units	5/1/00
pH Temperature	20.7	1.	1	EPA 150.1	°C	5/1/00
Specific Conductance	16400	1.	1	SM 2510 B	µS/cm	5/2/00
Total Dissolved Solids	16000	300.	20	SM 2540 C	mg/L	5/3/00

D.F. = Dilution Factor

ND = Not Detected

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NEL LABORATORIES

Kerr-McGee Chemical Corporation

CLIENT ID: M-44

Annual - 00

DATE SAMPLED: 5/2/00

NA

NEL SAMPLE ID: L0005030-05

Metals

ANALYST: JF - Reno Division

Aqueous

<u>PARAMETER</u>	<u>RESULT</u> <u>mg/L</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	1.8	0.1 mg/L	10	EPA 6010	5/3/00	5/9/00
Hexavalent Chromium	2.1	0.2 mg/L	20	SM 3500-Cr D	5/3/00	5/3/00

D.F. Dilution Factor

ND - Not Detected

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NEL LABORATORIES

Kerr-McGee Chemical Corporation

CLIENT ID: M-44

TEST ID: Annual - 00

DATE SAMPLED: 5/2/00

TEST #: NA

NEL SAMPLE ID: L0005030-05

Inorganic Non-Metals

MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	7.48	2.	1	EPA 150.1	pH Units	5/2/00
pH Temperature	22.7	1.	1	EPA 150.1	°C	5/2/00
Specific Conductance	14300	1.	1	SM 2510 B	µS/cm	5/3/00
Total Dissolved Solids	13600	150.	10	SM 2540 C	mg/L	5/3/00

D.F. Dilution Factor

ND Not Detected

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WEL LABORATORIES

Kerr-McGee Chemical Corporation
ID: Annual - 00
#: NA

CLIENT ID: M-94
DATE SAMPLED: 5/2/00
NEL SAMPLE ID: L0005030-02

Metals
MIX: Aqueous

ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	1.8	0.1 mg/L	10	EPA 6010	5/3/00	5/9/00
Hexavalent Chromium	1.7	0.02 mg/L	2	SM 3500-Cr D	5/3/00	5/3/00

D.F. Dilution Factor

ND Not Detected

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LABORATORIES

McGee's Chemical Corporation
 00
 NA

CLIENT ID: M-94
 DATE SAMPLED: 5/2/00
 NEL SAMPLE ID: L0005030-02

Inorganic Non-Metals
 Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
pH	7.44	2.	1	EPA 150.1	pH Units	5/2/00
pH Temperature	22.4	1.	1	EPA 150.1	°C	5/2/00
Specific Conductance	14200	1.	1	SM 2510 B	µS/cm	5/3/00
Total Dissolved Solids	12900	150.	10	SM 2540 C	mg/L	5/3/00

DF: Dilution Factor

ND: Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: Brightline-April/NA
PROJECT #: NA
TEST: Metals
MATRIX: Aqueous

CLIENT ID: M-84
DATE SAMPLED: 4/20/00
NEL SAMPLE ID: L0004183-04
ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	11	0.01 mg/L	1	EPA 6010	4/21/00	4/24/00

D.F. - Dilution factor

NID - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: UIC - April
PROJECT #: NA
TEST: Sm 3500-Cr D Hexavalent Chromium
MATRIX: Aqueous

CLIENT ID: M-84
DATE SAMPLED: 4/26/00
NEL SAMPLE ID: L0004250-01
ANALYST: GWD - Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Hexavalent Chromium	12	1. mg/L	100	SM 3500-Cr D	4/26/00	4/26/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: UIC - April
PROJECT #: NA

CLIENT ID: M-84
DATE SAMPLED: 4/26/00
NEL SAMPLE ID: L0004250-01

TEST: Inorganic Non-Metals
MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Dissolved Solids	12600	150.	10	SM 2540 C	mg/L	4/27/00

D.F. Dilution Factor

ND Not Detected

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NEL LABORATORIES

CLIENT ID: Kerr-McGee Chemical Corporation
PROJECT ID: Brightline-April/NA
PROJECT #: NA
TEST: Metals
MATRIX: Aqueous

CLIENT ID: M-100
DATE SAMPLED: 4/19/00
NEL SAMPLE ID: L0004179-03
ANALYST: JF - Reno Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Chromium	4.2	0.01 mg/L	1	EPA 6010	4/25/00	4/25/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: UIC - April
PROJECT #: NA
TEST: Sm 3500-Cr D Hexavalent Chromium
MATRIX: Aqueous

CLIENT ID: M-100
DATE SAMPLED: 4/26/00
NEL SAMPLE ID: L0004250-02
ANALYST: GWD - Division

<u>PARAMETER</u>	<u>RESULT</u> mg/L	<u>REPORTING</u> <u>LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>DIGESTED</u>	<u>ANALYZED</u>
Hexavalent Chromium	4.0	0.1 mg/L	10	SM 3500-Cr D	4/26/00	4/26/00

DF - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT: Kerr-McGee Chemical Corporation
PROJECT ID: UIC - April
PROJECT #: NA

CLIENT ID: M-100
DATE SAMPLED: 4/26/00
NEL SAMPLE ID: L0004250-02

TEST: Inorganic Non-Metals
MATRIX: Aqueous

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>D. F.</u>	<u>METHOD</u>	<u>UNITS</u>	<u>ANALYZED</u>
Total Dissolved Solids	8620	150.	10	SM 2540 C	mg/L	4/27/00

DF - Dilution Factor

ND - Not Detected

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**Laboratory
 Report
 #65434**

Kerr McGee Chemical Company -
 Henderson
 (continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilutio
M-23	(2004280150)			Sampled on 04/20/00				
	05/08/00	115468	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-48	(2004280151)			Sampled on 04/20/00				
	05/08/00	115468	(CADHS/EPA314)	Perchlorate		ug/l	80000	20000
M-86	(2004280152)			Sampled on 04/20/00				
	05/08/00	115468	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-82	(2004280153)			Sampled on 04/20/00				
	05/08/00	115468	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-83	(2004280154)			Sampled on 04/20/00				
	05/08/00	115469	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-84	(2004280155)			Sampled on 04/20/00				
	05/08/00	115469	(CADHS/EPA314)	Perchlorate	1300000	ug/l	200000	50000
M-85	(2004280156)			Sampled on 04/20/00				
	05/08/00	115470	(CADHS/EPA314)	Perchlorate		ug/l	8000	2000
002 MONITOR	(2004280157)			Sampled on 04/14/00				
	05/04/00	115212	(CADHS/EPA314)	Perchlorate		ug/l	200	50
001 MONITOR	(2004280158)			Sampled on 04/18/00				
	05/04/00	115214	(CADHS/EPA314)	Perchlorate		ug/l	200	50
002 MONITOR	(2004280159)			Sampled on 04/20/00				
	05/04/00	115214	(CADHS/EPA314)	Perchlorate		ug/l	200	50



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Laboratory
Report
#65434

Kerr McGee Chemical Company -
Henderson
Mark Porterfield
PO Box 55
Henderson , NV 89009

Samples Received
28-apr-2000 09:00:00

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilutio
M-98 (2004280141)				Sampled on 04/19/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	20000	5000
M-99 (2004280142)				Sampled on 04/19/00				
	05/08/00	115470	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-100 (2004280143)				Sampled on 04/19/00				
	05/08/00	115470	(CADHS/EPA314)	Perchlorate	990000	ug/l	200000	50000
M-101 (2004280144)				Sampled on 04/19/00				
	05/08/00	115470	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-102 (2004280145)				Sampled on 04/19/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	20000	5000
M-87 (2004280146)				Sampled on 04/20/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	80000	20000
M-88 (2004280147)				Sampled on 04/20/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	2000	500
M-81 (2004280148)				Sampled on 04/20/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	200000	50000
M-80 (2004280149)				Sampled on 04/20/00				
	05/07/00	115467	(CADHS/EPA314)	Perchlorate		ug/l	80000	20000



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**Laboratory
Report
#65883**

Kerr McGee Chemical Company -
Henderson
Mark Porterfield
PO Box 55
Henderson , NV 89009

Samples Received
11-may-2000 09:40:00

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
M-11 (2005110173)				Sampled on 05/03/00				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	72000	ug/l	8000	2000
M-12 (2005110174)				Sampled on 05/03/00				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	1600000	ug/l	200000	50000
[REDACTED]				[REDACTED]				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	200000	50000
[REDACTED]				[REDACTED]				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	80000	20000
M-36 (2005110177)				Sampled on 05/02/00				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	3500000	ug/l	200000	50000
M-37 (2005110178)				Sampled on 05/01/00				
	05/21/00	116423	(CADHS/EPA314)	Perchlorate	9900000	ug/l	1000000	250000
[REDACTED]				[REDACTED]				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	200000	50000
M-44 (2005110180)				Sampled on 05/02/00				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	2000000	ug/l	200000	50000
[REDACTED]				[REDACTED]				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	200000	50000



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Laboratory
Report
#65883

Kerr McGee Chemical Company -
Henderson
(continued)

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
M-94 (2005110182)				Sampled on 05/03/00				
	05/15/00	116014	(CADHS/EPA314)	Perchlorate	2000000	ug/l	200000	50000
[REDACTED]								
	05/23/00	116427	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	40	10
[REDACTED]								
	05/16/00	116015	(CADHS/EPA314)	Perchlorate	[REDACTED]	ug/l	800	200



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Report
Comments
#65883

(Sample#: 2005110178)

Test: Perchlorate

THE SAMPLE WAS ANALYZED TWICE AND THE DATA WAS CONFIRMED.

(Sample#: 2005110183)

Test: Perchlorate

THE SAMPLE WAS ALSO TREATED USING Ag AND H CARDTRIDGES ON
5/23/00 BUT THE DATA WAS NOT REPORTABLE DUE TO INTERFERENCE
WITH EC DETECTOR.



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Laboratory
QC Summary Report
#65883

Kerr McGee Chemical Company -
Henderson

QC Batch #116014 - Perchlorate

Analysis Date: 05/15/2000

2005110173	M-11
2005110174	M-12
2005110175	M-17
2005110176	M-25
2005110177	M-36
2005110179	M-38
2005110180	M-44
2005110181	M-89
2005110182	M-94

QC Batch #116015 - Perchlorate

Analysis Date: 05/16/2000

2005110184	001 OUTFALL
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QC Batch #116423 - Perchlorate

Analysis Date: 05/21/2000

2005110178	M-37
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QC Batch #116427 - Perchlorate

Analysis Date: 05/23/2000

2005110183	001 OUTFALL
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Laboratory
 QC Report
 #65883

Kerr McGee Chemical Company -
 Henderson

QC Batch #116014

Perchlorate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 20	05110003		(0.00 - 0.00)	
LCS1	Perchlorate	25.0	27.2	108.8	(90.00 - 110.00)	
LCS2	Perchlorate	25.0	25.8	103.2	(90.00 - 110.00)	5.3
MBLK	Perchlorate	ND				
MS	Perchlorate	25.0	29.0	116.0	(75.00 - 125.00)	
MSD	Perchlorate	25.0	27.8	111.2	(75.00 - 125.00)	4.2

QC Batch #116015

Perchlorate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 20	05120236		(0.00 - 0.00)	
LCS1	Perchlorate	25.0	26.2	104.8	(90.00 - 110.00)	
LCS2	Perchlorate	25.0	26.5	106.0	(90.00 - 110.00)	1.1
MBLK	Perchlorate	ND				
MS	Perchlorate	25.0	28.2	112.8	(75.00 - 125.00)	
MSD	Perchlorate	25.0	28.5	114.0	(75.00 - 125.00)	1.1

QC Batch #116423

Perchlorate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 20	05190183		(0.00 - 0.00)	
LCS1	Perchlorate	25.0	24.8	99.2	(90.00 - 110.00)	
LCS2	Perchlorate	25.0	24.2	96.8	(90.00 - 110.00)	2.4
MBLK	Perchlorate	ND				
MS	Perchlorate	25.0	24.9	99.6	(75.00 - 125.00)	
MSD	Perchlorate	25.0	24.7	98.8	(75.00 - 125.00)	0.81

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
 Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.



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Laboratory
QC Report
#65883

Kerr McGee Chemical Company -
Henderson
(continued)

QC Batch #116427

Perchlorate

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 20	05160031		(0.00 - 0.00)	
LCS1	Perchlorate	25.0	26.7	106.8	(90.00 - 110.00)	
LCS2	Perchlorate	25.0	27.2	108.8	(90.00 - 110.00)	1.9
MBLK	Perchlorate	ND				
MS	Perchlorate	25.0	29.2	116.8	(75.00 - 125.00)	
MSD	Perchlorate	25.0	27.7	110.8	(75.00 - 125.00)	5.3

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

65887



MONTGOMERY WATSON LABORATORIES

555 East Walnut St., Pasadena, CA 91101 626-568-6425; Fax 626-568-6324

Fed Exp #

Destination: MONTGOMERY

Cooler #

Other

Chain of Custody Record

Client Name	Kerr-McGee Chemical	Project	Job # (if internal)	Client Code: KERR MCGEE-MP	Temperature on receipt
Date	Time	Sample ID	Description (eg. Inf)	Total Number of Bottles	QC
5/3		M-11	AQ	1	X
5/3		M-12	AQ	1	X
5/2		M-17	AQ	1	X
5/2		M-25	AQ	1	X
5/2		M-36	AQ	1	X
5/1		M-37	AQ	1	X
5/2		M-38	AQ	1	X
5/2		M-44	AQ	1	X
5/2		M-89	AQ	1	X
5/3		M-94	AQ	1	X
5/2		001 Outfall	AQ	1	X
5/9		001 Outfall	AQ	1	X

T = 6°C

Signature	Print Name	Company/Title	Date	Time
Relinquished By: <i>Mark J. Porterfield</i>	Mark J. Porterfield	Kerr-McGee Sr. Env. Spec.	5/10/00	1410
Received By: <i>VR</i>	VR	KERR	5/10/00	9340
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				


KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 • HENDERSON, NEVADA 89008

November 12, 1999

Ms. Cathe Pool
 Supervisor Permit Section
 Bureau of Water Pollution Control
 Nevada Division of Environmental Protection
 333 West Nye Lane
 Carson City, NV 89710

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 2
To Jennifer Carr	From SUSAN CROWLEY	
Co. NDEP	Co. KM	
Dept.	Phone # (702) 651-2234	
Fax # (775) 687-5856	Fax # (702) 651-2310	

Dear Ms. Pool:

Subject: Temporary Discharge Permit #TNEV99106

Kerr-McGee Chemical LLC (Kerr-McGee) has applied for a temporary discharge permit to allow treatment for perchlorate in a seep near the Las Vegas Wash. That permit was issued by your office on November 10, 1999, and forwarded to Kerr-McGee. After reviewing that permit, Kerr-McGee requests that it be clarified and modified as follows:

- ❖ The narrative limitation in Table 1.1 for Attachment A constituents appears to be incomplete (the last sentence appears to end in mid-sentence). More importantly, while we believe that we are in agreement concerning the applicable limits, the permit language is unclear and subject to misinterpretation. For example, the language could be interpreted as requiring Kerr-McGee to make some sort of compliance "demonstration," rather than simply monitoring the influent and effluent to the treatment system. Also, the language in the permit does not fully reflect the understanding we had reached concerning the analytical uncertainty associated with the measurement of pollutants at low concentration levels. Accordingly, we request that the limitation for Attachment A constituents be corrected and revised as follows:

"No increase in the concentration or loading to the Wash of Attachment A constituents, provided however that, in demonstrating compliance, the permittee shall be required to use only data at or above the Practical Quantification Limit (PQL) of the approved analytical method for the regulated constituent. The permittee shall be deemed to be in compliance so long as the concentration or loading of the pollutant in the effluent is equal to or lower than the concentration or loading in the influent, taking into account the range of accuracy of the analytical method. However, the permittee shall report all data above the Method Detection Limit (MDL)."

- ❖ Kerr-McGee is aware of NDEP efforts to work with other responsible parties to address constituents other than perchlorate. To reflect this in the Section I.A.9 Schedule of Compliance, Kerr-McGee requests that items b. and d. of this Section be combined so that d. would be eliminated and b. would read as follows:

Cathe Pool
November 12, 1999
Page 2

"b. The permittee shall fully cooperate with any persons required by NDEP to treat the discharge subsequent to treatment for perchlorate. This includes cooperation with other persons in their activities associated with the following issues: 1) Total Dissolved Solids compliance with the Colorado River Salinity Standards (NAC 445A.143); 2) their evaluation of the type of technology which is considered to be the best degree of treatment or control practicable or economically achievable (BAT) for each constituent which does not meet water quality standards listed in NAC 445A.144, 445A.199 and the applicable standards in 40 CFR 131; 3) an evaluation of a mixing zone for each constituent which does not meet water quality standards; 4) an evaluation of disposal options including re-injection, re-use as production water or otherwise, and infiltration basins."

In addition, during our review of the temporary discharge permit, we observed potential conflicts among various conditions that could impact our ability to operate the perchlorate removal system. Specifically, the Synopsis and text in Table I.1 that describe the "other" constituents in the intake water conflict with many of the Narrative Standards in Part I.A.2 and I.A.4. It is our understanding that the permit allows Kerr-McGee to discharge the seep water after treatment for perchlorate and that the descriptions and requirements in the Synopsis and Table I.1 pertaining to other constituents in the seep water are the basis for the permit. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,



Susan Crowley
Staff Environmental Specialist

cc: PSCorbett
LKBailey
WOGreen
EMSpore
FRStater
J Worthington
Rick Simon, ENSR
Corinne Goldstein, Covington and Burling
Doug Zimmerman, NDEP
Leo Drozdoff, NDEP

PART I- Synopsis

The Permittee is required to treat the "seep" found near the Las Vegas Wash through a Consent Agreement entered into with the State of Nevada on July 26, 1999. The Consent Agreement requires that the Permittee treat recovered "seep" water for perchlorate under an aggressive time schedule. Through the review of the permit application, the Division has become aware that there are certain other constituents which may be related to other industrial activities at the BMI Complex and which exceed the water quality standards. These other constituents are not covered under the Consent Agreement and have not been determined to be the responsibility of the Permittee. There is not enough information at this time, to determine if the other constituents would cause an exceedance of a water quality standard in the receiving water. Additionally, the "seep" is currently entering the receiving water untreated and any perchlorate removal will only improve the water quality. There is also not enough information about the possible effects perchlorate treatment technologies on the concentration of the other constituents. Therefore, the Division has determined it is in the best interest of the receiving water to allow the treatment of perchlorate to begin, with the other constituents being dealt with in the Schedule of Compliance and through negotiations with the other responsible parties. The requirement for the Permittee to not increase the concentration or loading to the Wash (of these other constituents) as a result of the discharge is included in the permit. The Permittee shall comply with the effluent limitations listed in Table I.1; all other water quality standards are addressed in the schedule of compliance as authorized by NAC 445A.244.2.

I.A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND CONDITIONS

I.A.1. During the period beginning on the effective date of this permit, and lasting until the permit expires, the permittee is authorized to discharge treated "seep" water from Outfall 001. Effluent samples taken in compliance with the monitoring requirements specified below shall be taken after treatment and prior to mixing with the receiving waters. Effluent samples are designated as **EFF**. Influent samples are to be taken at the headworks and are designated as **INF**. Upstream and downstream samples are to be taken in the Las Vegas Wash upstream and downstream of the discharge point.

The discharge shall be limited and monitored by the permittee as specified below:

TABLE I.1

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Flow	1 MGD	M & R	-----	EFF	Continuous	Flow meter
BOD₅	25 mg/l	45 mg/l	M & R	INF, EFF	Weekly	Discrete
Perchlorate	3 mg/l*	M & R	97%* removal	INF, EFF upstream and downstream	Weekly	Discrete samples taken daily and composited onto one weekly composite.
	*whichever is greater					
Attachment A	The permittee shall demonstrate that there is no increase in the concentration or loading to the Wash of the "other" constituents as a result of the discharge. The permittee shall only be responsible for utilizing results in this demonstration which are greater than the practical quantification limit (PQL), however all data above the method detection limit (MDL) shall be reported.			INF, EFF, upstream and downstream	Quarterly	Discrete



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

November 2, 1999

Ms. Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710



Dear Ms. Pool:

Subject: Discharge Application for Perchlorate Removal Action

In its September 17, 1999, "NPDES Permit Application for Perchlorate Removal Action," Kerr-McGee Chemical LLC (Kerr-McGee) supplied an attachment presenting limited preliminary analytical data. An error in preparing the attachment resulted in several units being mislabeled. This submission corrects those attachment errors and provides additional data in support of the requested NPDES permit. The data are also applicable to the Kerr-McGee temporary permit request, now pending with NDEP, which was submitted to the agency on October 22, 1999.

The preliminary data were analyzed by one of Kerr-McGee's regular contract laboratories, Lancaster Laboratories (Lancaster) in Lancaster, Pennsylvania. The analyses utilized RCRA protocols (series 8000 methods) which are the norm for the Kerr-McGee Quality Assurance Project Plan (QAPP). Since Lancaster is not certified in the state of Nevada, and since the NPDES application requires use of protocols specified in 40CFR136 (series 600 methods), additional analyses have been performed by the state-certified NEL Laboratories (NEL) of Las Vegas, Nevada.

Kerr-McGee is providing NDEP with an expanded series of analytical data generated by Lancaster, along with data from NEL Laboratories on several samples. It should be noted that the method detection limits (MDLs) and practical quantitation limits (PQLs) for the 600 series methods used by NEL are somewhat higher than those for 8000 series methods used by Lancaster.

Neither the series 600 methods required by NDEP nor the series 8000 methods result in PQLs sufficiently low to measure organics at the concentration standards set for the Las Vegas Wash. Accordingly, Kerr-McGee proposes that NDEP accept the PQLs of the 600 series analyses performed by NEL as the basis for developing NPDES permit limits and for demonstrating compliance with both the NPDES and the temporary discharge permits. The NEL PQLs compare favorably with USEPA Contract Laboratory Program requirements for the 600 series analyses (see USEPA Contract Laboratory Program, Statement of Work for Organic Analysis, August 1994).

The attached Table 1 shows analytical data from both Lancaster and NEL using the two sets of protocols described above. The information is arranged as follows:

- ❖ Data for the seep near the Las Vegas Wash and for a combined flow consisting of the seep, water from the Pittman Lateral and water collected on the Kerr-McGee site are shown in the first three columns of the table.
- ❖ Projected effluent concentrations from treatment of the two water streams are shown in subsequent columns.
 - The projections for ion exchange treatment of seep water were developed assuming no removal of constituents other than perchlorate.
 - Biological treatment projections reflect the results of laboratory testing for the seep and the combined flows with the conservative assumption that organics are not removed. Adjustments have been made for expected nutrient additions and vendor contract limits for ammonia, phosphorus, BOD and TSS.

Ms. Cathe Pool
November 2, 1999
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- ❖ The column second from the right in the table reflects the NEL PQL for the various organic analytes.
- ❖ The right-most column highlights the ten constituents for which Kerr-McGee intends to submit mixing zone analyses. The mixing zone analyses will be provided in approximately four weeks.

We hope these data will clear up any confusion caused by the earlier data attachment and aid NDEP in reviewing the pending NPDES and temporary discharge permit applications. We look forward to meeting with NDEP to discuss this information in the near future. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,


Susan Crowley
Staff Environmental Specialist

Attachment

cc: LKBailey
KDihlberg
PSCorbett
WOGreen
EMSpore
JTSmith
FRStater
Brenda Pohlmann, NDEP
Doug Zimmerman, NDEP
Leo Drozdoff, NDEP
Bill Gorham, ENSR
Rick Simon, ENSR
Dave Urban, ENSR
Mark Warner, ENSR

Table 1. Analytical Data and Process Projections

Constituent	Seep SF-1	Seep Composite	Seep Grab	Seep Grab	Composite Seep,PL,KM	Composite Seep,PL,KM	Projected Ion	Projected Seep	Projected Composite	Typical NEL	Anticipated
	Lancaster 5/21/99	Lancaster 7/27/99	Lancaster 9/14/99	NEL 9/14/99	Lancaster 9/13/99	NEL 9/13/99	Exchange Effluent	Bio-Plant Effluent	Bio-Plant Effluent	Organic PQLs	Mixing Zone Analyses
pH	7.85		7.34	7.56	7.56	7.65	7.8	6.5-8	6.5-8		
CIO4, mg/L (Mont.Watson)	100				310*		<1	<1	<1		
CIO3, mg/L (Tech Center)	100						ND	ND	ND		
TDS, mg/L	7300				12000*		7300	8000	13000		Mix Zone
TSS, mg/L			ND	13.2	ND	7.6	14	<30	<30		
TOC, mg/L	4.6		5.6		3.9	3.1					
TON, mg/L			ND	0.35	ND	ND					
TOX, mg/L											
SO4, mg/L	1950			1900	2140	2000	2000	2000	2100		
Sulfide, mg/L			ND	ND	ND	ND	ND	ND	ND		
Sulfite, mg/l				ND	ND	ND	ND	ND	ND		
PO4, mg/L	0.56						0.6				
Tot Phosphorus, mg/L			0.136	0.04	0.142	0.04	0.136	2-3	2-3		
Cl, mg/L	2300				4400*		2400	2300	4400		Mix Zone
Total Cyanide, mg/L	ND		ND	ND	ND	ND	ND	ND	ND		
Total Nitrite/Nitrate N, mg/L	6.98			8.5	19.5	20	8.5	ND	ND		
Ammonia, as N, mg/L			0.15 J	ND	ND	ND	ND	5	5		
Biochem O2 Demand, mg/L			1.42 J	ND	2.4	ND	1.42	30	30		
Bromide, mg/L				ND	ND	ND	ND	ND	ND		
Chem O2 Demand, mg/L			9.6	140	5.2 J	83	140				
Color, color units			20	15	30	15	20				
Fluoride, mg/L				1.6	1.29	1.3	1.6				
MBAS, mg/L			0.73	0.25	1.18	0.28	0.73				
Oil & Grease, mg/L			ND	3.8	ND	20	3.8				
TKN (Kjeldahl nitrogen), mg/L			0.41 J	0.35	ND	ND	0.41				
Fecal Coliform, MPN/100ml			40	110	ND	ND	110				
Chlorine residual, mg/L			0.084 J	0.02	1.05	0.13	ND	ND	ND		
Metals, mg/L											
Aluminum	0.22		ND	0.15	ND	0.047	s	s	s		
Antimony	ND		ND	ND	ND	ND	a	a	a		
Arsenic	0.103		0.115		0.123	0.14	m	m	m		Mix Zone
Barium	0.0214 J		0.0183 J	0.021	0.0223 J	0.025	e	e	e		
Beryllium	ND		ND	ND	ND	ND					
Boron				3.6	4.4	4.6	a	a	a		Mix Zone
Cadmium	ND		ND	ND	ND	ND	s	s	s		
Calcium	552										
Chromium	ND		ND	ND	0.573	0.62	f	f	f		Mix Zone
Chromium hexavalent	ND						e	e	e		
Cobalt	ND		ND		ND	ND	e	e	e		
Copper	ND		ND	0.0081	ND	0.0055	d	d	d		
Iron	ND		ND	ND	0.032 J	0.1					
Lead	ND		ND	ND	ND	ND	a	a	a		
Magnesium	211		207	240	252		n	n	n		
Manganese	0.946		1.68	1.8	1.06	1.2	a	a	a		Mix Zone
Mercury	ND		ND	ND	ND	ND	l	l	l		
Molybdenum			0.112	0.12	0.085	0.085	y	y	y		Mix Zone
Nickel	0.0152 J			ND	0.0122	ND	s	s	s		
Potassium	45.8						e	e	e		
Selenium	0.011		0.008 J	ND	0.0077 J	0.012	s	s	s		Mix Zone
Silver	ND		ND	ND	ND	ND					
Sodium	1520										
Strontium	11.2										
Thallium	ND		ND	ND	ND	ND					
Tin			ND	ND	ND						
Vanadium	0.051				1						
Zinc	ND		ND	ND	0.035	ND					

Constituent	Seep SF-1 Lancaster 5/21/99	Seep Composite Lancaster 7/27/99	Seep Grab Lancaster 9/14/99	Seep Grab NEL 9/14/99	Composite Seep,PL,KM Lancaster 9/13/99	Composite Seep,PL,KM NEL 9/13/99	Projected Ion Exchange Effluent	Projected Seep Bio-Plant Effluent	Projected Composite Bio-Plant Effluent	Typical NEL Organic PQLs	Anticipated Mixing Zone Analyses
Herbicides, µg/L											
2,4-D	ND					ND	s	s	s		
2,4,5-TP	0.0362 J		0.0403 J		0.084	ND	a	a	a		
2,4,5-T	0.257					ND	m	m	m		
Dalapon	0.79 J						e	e	e		
Dinoseb	0.39					ND					
Dicamba	0.099						a	a	a		
MCPP	ND						s	s	s		
MCPA** see notes	28000										
2,4-DP (dichloroprop)	ND					ND	f	f	f		
2,4-DB	ND					ND	e	e	e		
pentachlorophenol	0.017 J		ND		ND		e	e	e		
							d	d	d		
TCL Pesticides, µg/L											
Alpha BHC	0.664		0.69	0.92	0.432	0.46				0.1	Mix Zone
Beta BHC	0.249		0.372	0.3	0.171	ND				0.1	
Delta, BHC	1.68		1.71	1.9	0.65	0.93	s	s	s	0.1	
Gamma BHC, Lindane	0.0052 J		0.0511	ND	0.031	0.11	a	a	a	0.1	Mix Zone
Heptachlor	ND		ND	ND	ND	ND	m	m	m	0.1	
Aldrin	0.0026 J		0.0155	ND	ND	ND	e	e	e	0.1	
Heptachlor Epoxide	0.0044 J		0.00181 J	ND	ND	ND				0.1	
Endosulfan I	ND		ND	ND	ND	ND	a	a	a	0.1	
Dieldrin	ND		ND	ND	ND	ND	s	s	s	0.1	
DDE	0.0073 J		ND	ND	ND	ND				0.1	
Endrin	0.0042 J		ND	ND	ND	ND	f	f	f	0.1	
Endsulfan II	ND		ND	ND	ND	ND	e	e	e	0.1	
DDD	0.0114 J		ND	ND	ND	ND	e	e	e	0.1	
Endosulfan Sulfate	ND		ND	ND	ND	ND	d	d	d	0.1	
DDT	ND		ND	ND	ND	ND				0.1	
Endrin Keytone	ND										
Methoxychlor	ND			ND	ND	ND	s	s	s	0.5	
Alpha Chlordane	0.0025 J		ND	ND	ND	ND	a	a	a	0.5	
Gamma Chlordane	ND		ND	ND	ND	ND	m	m	m	0.5	
Toxaphene	ND		ND	ND	ND	ND	e	e	e	2	
Endrin Aldehyde	ND		ND	ND	ND	ND				0.1	
PCB 1016	ND		ND	ND	ND	ND	a	a	a	0.5	
PCB 1221	ND		ND	ND	ND	ND	s	s	s	0.5	
PCB 1232	ND		ND	ND	ND	ND				0.5	
PCB 1242	ND		ND	ND	ND	ND	f	f	f	0.5	
PCB 1248	ND		ND	ND	ND	ND	e	e	e	0.5	
PCB 1254	ND		ND	ND	ND	ND	e	e	e	0.5	
PCB 1260	ND		ND	ND	ND	ND	d	d	d	0.5	
Semi-Volatiles µg/L											
Phenol	ND		ND	ND	ND	ND	s	s	s		
Bis(2-chlorethyl) ether	ND		ND	ND	ND	ND	a	a	a		
2-chlorophenol	ND		ND	ND	ND	ND	m	m	m		
1,3 dichlorobenzene	ND		0.5 J	ND	ND	ND	e	e	e		
1,4 dichlorobenzene	ND		0.7 J	ND	ND	ND					
1,2 dichlorobenzene	ND		0.6 J	ND	ND	ND	a	a	a		
2-methylphenol	ND						s	s	s		
2,2'oxybis(1-Chloropropane)	ND										
4-Methylphenol	ND						f	f	f		
N-Nitroso-di-n-propylamine	ND		ND	ND	ND	ND	e	e	e		
N-Nitroso-dimethylamine			ND	ND	ND	ND	e	e	e		
Hexachloroethane	ND		ND	ND	ND	ND	d	d	d		
Nitrobenzene	ND		ND	ND	ND	ND					
Isophorone	ND		ND	ND	ND	ND					
2-Nitrophenol	ND		ND	ND	ND	ND					
2,4-Dimethylphenol	ND		ND	ND	ND	ND					

Constituent	Seep SF-1 Lancaster 5/21/99	Seep Composite Lancaster 7/27/99	Seep Grab Lancaster 9/14/99	Seep Grab NEL 9/14/99	Composite Seep,PL,KM Lancaster 9/13/99	Composite Seep,PL,KM NEL 9/13/99	Projected Ion Exchange Effluent	Projected Seep Bio-Plant Effluent	Projected Composite Bio-Plant Effluent	Typical NEL Organic PQLs	Anticipated Mixing Zone Analyses
Bis(2-chloroethoxy)methane	ND		ND	ND	ND	ND	a	a	a		
2,4-Dichlorophenol	ND		ND	ND	ND	ND	n	n	n		
1,2,4-Trichlorobenzene	1 J		2 J	ND	0.5 J	ND	a	a	a		
Napthalene	ND		ND	ND	ND	ND	l	l	l		
4-Chloroaniline	ND						y	y	y		
Hexachlorobutadiene	ND		ND	ND	ND	ND	s	s	s		
4-Chloro-3-methylphenol	ND		ND	ND	ND	ND	e	e	e		
2-Methylnapthalene	ND						s	s	s		
Hexachlorocyclopentadiene	ND		ND	ND	ND	ND					
2,4,6-Trichlorophenol	ND		ND	ND	ND	ND					
2,4,5-Trichlorophenol	ND										
2-Chloronapthalene	ND		ND	ND	ND	ND					
2-Nitroaniline	ND										
Dimethylphthalate	ND		ND	ND	ND	ND					
Acenaphthylene	ND		ND	ND	ND	ND					
TCL by 8260 µg/L											
Chloromethane	ND		ND	ND	ND	ND	s	s	s		
Bromomethane	ND		ND	ND	ND	ND	a	a	a		
Vinyl chloride	ND		ND	ND	ND	ND	m	m	m		
Chloroethane	ND		ND	ND	ND	ND	e	e	e		
Methylene chloride	ND		ND	ND	ND	ND					
Acetone	ND						a	a	a		
Carbon Disulfide	ND						s	s	s		
1,1-dichloroethene	ND		ND	ND	ND	ND					
1,1-dichloroethane	ND		2 J	ND		ND	f	f	f		
Chloroform	ND		ND	ND	2 J	ND	e	e	e		
1,2-Dichloroethane	ND		ND	ND	ND	ND	e	e	e		
2-Butanone	ND						d	d	d		
1,1,1-trichloroethane	ND		ND	ND	ND	ND					
Carbon Tetrachloride	ND		ND	ND	ND	ND	a	a	a		
Bromodichloromethane	ND		ND	ND	ND	ND	n	n	n		
1,1,2,2-Tetrachloroethane	ND		ND	ND	ND	ND	a	a	a		
1,2-Dichloropropane	ND		ND	ND	ND	ND	l	l	l		
trans-1,3-Dichloropropene	ND		ND	ND	ND	ND	y	y	y		
Trichloroethene	ND		ND	ND	ND	ND	s	s	s		
Dibromochloromethane	ND		ND	ND	ND	ND	e	e	e		
1,1,2-Trichloroethane	ND		ND	ND	ND	ND	s	s	s		
Benzene	ND		ND	ND	ND	ND					
cis-1,3-Dichloropropene	ND		ND	ND	ND	ND					
Bromoform	ND		ND	ND	ND	ND					
4-methyl-2-pentanone	ND										
2-Hexanone	ND										
Tetrachloroethene	ND		ND	ND	ND	ND					
Toluene	ND		ND	ND	ND	ND					
Chlorobenzene	ND		ND	ND	ND	ND					
Ethylbenzene	ND		ND	ND	ND	ND					
Styrene	ND			ND		ND					
Xylene (total)	ND			ND		ND					
trans-1,2-Dichloroethene	ND		ND	ND	ND	ND					
cis-1,2-Dichloroethene	ND		ND	ND	ND	ND					
MTBE				ND		8					
Trichlorofluoromethane				ND		ND					
Trichlorotrifluoroethane						ND					
2-chloroethylvinyl ether					ND	ND					
TCL SW846 semivols µg/L											
3-Nitroaniline	ND						s	s	s		
Acenaphthene	ND		ND	ND	ND	ND	a	a	a		
2,4-Dinitrophenol	ND		ND	ND	ND	ND	m	m	m		
							e	e	e		

Constituent	Seep	Seep	Seep	Seep	Composite	Composite	Projected	Projected	Projected	Typical	Anticipated
	SF-1 Lancaster 5/21/99	Composite Lancaster 7/27/99	Grab Lancaster 9/14/99	Grab NEL 9/14/99	Seep,PL,KM Lancaster 9/13/99	Seep,PL,KM NEL 9/13/99	Ion Exchange Effluent	Seep Bio-Plant Effluent	Composite Bio-Plant Effluent	NEL Organic PQLs	Mixing Zone Analyses
4-Nitrophenol	ND		ND	ND	ND	ND					
Dibenzofuran	ND										
2,4-Dinitrotoluene	ND		ND	ND	ND	ND	a	a	a		
2,6-Dinitrotoluene	ND		ND	ND	ND	ND	s	s	s		
Diethylphthalate	ND		ND	ND	ND	ND					
4-Chlorophenyl-phenylether	ND		ND	ND	ND	ND	f	f	f		
Fluorene	ND		ND	ND	ND	ND	e	e	e		
4-Nitroaniline	ND						e	e	e		
4,6-Dinitro-2-methylphenol	ND		ND	ND	ND	ND	d	d	d		
N-Nitrosodiphenylamine	ND			ND	ND	ND					
4-Bromophenyl-phenylether	ND		ND	ND	ND	ND	a	a	a		
Hexachlorobenzene	ND		ND	ND	ND	ND	n	n	n		
Pentachlorophenol	ND		ND	ND	ND	ND	a	a	a		
Phenthrene	ND		ND	ND	ND	ND	l	l	l		
Anthracene	ND		ND	ND	ND	ND	y	y	y		
Carbazole	ND						s	s	s		
Di-n-butylphthalate	ND		ND	ND	ND	ND	e	e	e		
Fluoranthene	ND		ND	ND	ND	ND	s	s	s		
Pyrene	ND		ND	ND	ND	ND					
Butylbenzylphthalate	ND		ND	ND	ND	ND					
3,3-dichlorobenzidine	ND		ND	ND	ND	ND					
Benzo(a)anthracene	ND		ND	ND	ND	ND					
Bis(2-ethylhexyl)phthalate	ND		ND	ND	4 J	ND					
Crysene	ND		ND	ND	ND	ND					
Di-n-octylphthalate	ND		ND	ND	ND	ND					
Benzo(b)fluoranthene	ND		ND	ND	ND	ND					
Benzo(k)fluoranthene	ND		ND	ND	ND	ND					
Benzo(a)pyrene	ND		ND	ND	ND	ND					
Indeno(1,2,3-cd)pyrene	ND		ND	ND	ND	ND					
Dibenz(a,h)anthracene	ND		ND	ND	ND	ND					
Benzo(g,h,i)perylene	ND		ND	ND	ND	ND					
Bis(2-chloroisopropyl)ether			ND	ND	ND	ND					
1,2-Dichlorobenzene (oDCB)				ND		ND					
1,3-Dichlorobenzene (mDCB)				ND		ND					
1,4-Dichlorobenzene (pDCB)				ND		ND					
Phos. Pesticides, µg/L							s	s	s		
Diazinon				ND	ND		a	a	a		
Disolfoton				ND	ND		m	m	m		
Ethion				ND	ND		e	e	e		
Mirex		ND			ND						
Demeton-O		ND		ND		ND	a	a	a		
Demeton-S		ND		ND		ND	s	s	s		
Guthion		ND	ND	ND	ND	ND					
Malathion		ND	ND	ND	ND	ND	f	f	f		
Ethyl Parathion		ND	ND	ND	ND	ND	e	e	e		
Methyl Parathion				ND		ND	e	e	e		
							d	d	d		

Notes:

* – Data from other sources added for clarity.

** – Compound has MCPA residence time but is not MCPA. Actually <3.9 ppb of an unknown organic.



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

October 22, 1999



Ms. Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Ms. Pool:

Subject: NPDES Permit Applications for the Perchlorate Removal Action

This correspondence is intended to provide you with Kerr-McGee Chemical LLC's (Kerr-McGee) temporary discharge permit application for the Kerr-McGee Perchlorate Removal Action. In addition, included is our approach for dealing with parameters that may require a mixing zone application in our permanent NPDES permit application for this project. We would like to meet with you at your earliest convenience to discuss the permitting process.

Temporary (360 gpm seep) Discharge Permit

Please find enclosed two copies of a temporary discharge permit application for this project, as well as Check No. 07807 for \$250 to cover the application fee. The near-term perchlorate removal action will consist of capture and treatment for impacted groundwater (the seep) surfacing north of the BMI lower ponds and adjacent to the Las Vegas Wash. The water captured at the seep will be treated with ion exchange or biodegradation technologies to remove perchlorate, and the effluent will be discharged under terms of the permit.

Based on our previous discussions, we understand that NDEP will permit Kerr-McGee to return water back to the seep surface flow that has concentrations of constituents, other than perchlorate, similar to those currently in the seep water. We also understand that NDEP has concerns for the effect of ammonia and phosphorus loading on the Total Maximum Daily Load (TMDL) for the stream. Both treatment technologies presented in the temporary permit application for the seep are capable of meeting the average monthly discharge limits for ammonia and phosphorus of 50 and 20 pounds per day, respectively.

During system development, construction, and testing, treated water may not be available to return to the seep. If required by other agencies, Kerr-McGee will discharge Lake Mead water through the return system to prevent any substantial wetland area impact which might be created by the reduced seep flow.

Permanent (825 gpm combined flow) NPDES Discharge Permit

Please note that Kerr-McGee is continuing to develop a long-term remediation project for groundwater contaminated with perchlorate in the Pittman Lateral area. When completed, the long-term remediation will include the water captured at the seep. The long-term remediation will utilize the biodegradation technology.

Due to non-perchlorate constituents of concern in the waters to be remediated (seep and other groundwater), and byproducts from the biodegradation process, Kerr-McGee will be submitting a mixing zone application for those parameters that have the potential to exceed applicable water quality standards. The mixing zone application will be submitted when additional data are available. At present, Kerr-McGee anticipates that discharge from the long-term, higher volume, treatment process will be able to meet the discussed 50 pounds per day effluent ammonia limit; however, it will be difficult to meet the 20 pounds per day effluent phosphorus limit.

To help expedite the permitting process for the long-term remediation, we are providing the following summary of our approach for the mixing zone analysis for your review. As mentioned above, we would like to schedule a meeting as soon as possible to discuss and agree upon this approach so that we may complete the analysis.

Mixing Zone Approach

Development of a mixing zone will require the following steps:

1. Identify Parameters of Concern

The parameters of concern in the seep, Pittman Lateral, and groundwater at the Kerr-McGee facility for which a mixing zone will be requested will be identified. This list would include parameters that exceed an applicable standard and those that have not exceeded the applicable standard, but have the potential to exceed the standard based on a normal distribution of results. A table showing analyses for seep constituents was included with the September 17, 1999, Kerr-McGee NPDES permit application.

2. Characterize Receiving Stream (Las Vegas Wash)

The flow in the Las Vegas Wash will be defined. Because of the population growth in the area, the flows in the Las Vegas Wash are dominated by wastewater treatment plant effluent in the Las Vegas Wash and have been increasing. The low flow for the mixing zone analysis will be determined based on historical data and projected growth. NDEP has supplied background data for many constituents in the wash, which will be utilized in the assessment.

3. Establish Discharge Characteristics

The reasonable potential value (the value that is expected to be the highest discharge concentration with 95- to 99-percent confidence, per US Environmental Protection Agency Technical Support Document for Water Quality-Based Toxic Control, EPA 1992) will be used in the mixing zone application. The mass loading will also be calculated. For those parameters that are currently in the seep, the mass associated with the seep will be subtracted from the total mass potentially discharged from the treatment system, since the seep contribution will have already been accounted for in the Wash background.

4. Complete Mixing Zone Calculations

Since the NDEP has stated that for this project complete mixing in the Las Vegas Wash can be assumed, the mixing zone calculations will simply entail mass balances. The worst-case mass loading from the treatment system will be used to establish permit limits. If the calculated receiving water concentration (RWC) meets water quality standards, then the mixing zone is feasible. If the RWC exceeds the standards, then additional treatment or a modified approach may be needed.

As an example, using rounded figures:

For TDS (total dissolved solids)

If:

- wash low flow is 100 mgd
- wash average TDS is 1,500 mg/l
- treatment plant flow is 1 mgd
- effluent TDS is 10,000 mg/l
- water quality standard in the Wash is 1,900 mg/l

Then:

$$\text{the RWC} = \frac{100 \text{ mgd} \times 1,500 \text{ mg/l} + 1 \text{ mgd} \times 10,000 \text{ mg/l}}{100 \text{ mgd} + 1 \text{ mgd}} = 1,584 \text{ mg/l TDS}$$

which indicates that the treatment plant effluent would increase the TDS concentration by 84 mg/l. The final TDS of 1,584 mg/l is less than the WQS of 1,900 mg/l, and a mixing zone would be viable.

If the contribution of the seep is backed out of the calculation (as the seep is already accounted for in the wash flow and wash TDS concentration), the above calculation is modified as follows:

- Wash low flow is 100 mgd downstream of seep
- Wash TDS concentration is 1,500 mg/l downstream of seep
- Seep flow is 0.5 mgd (360 gpm)
- Seep TDS concentration is 7,500 mg/l
- Other treatment plant flow is 1.0 - 0.5 = 0.5 mgd

Concentration of TDS from other treatment plant flow:

$$\begin{aligned} &= \frac{\text{Mass of TDS in treatment plant discharge} - \text{Mass of TDS in seep}}{\text{treatment plant flow} - \text{seep flow}} \\ &= \frac{(1 \text{ mgd} \times 10,000 \text{ mg/l}) - (0.5 \text{ mgd} \times 7,500 \text{ mg/l})}{1.0 \text{ mgd} - 0.5 \text{ mgd}} \\ &= 12,500 \text{ mg/l} \end{aligned}$$

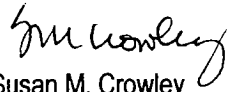
The RWC downstream of the seep would be:

$$\begin{aligned} \text{RWC} &= \frac{100 \text{ mgd} \times 1,500 \text{ mg/l} + 0.5 \text{ mgd} \times 12,500 \text{ mg/l}}{100 \text{ mgd} + 0.5 \text{ mgd}} \\ &= 1,555 \text{ mg/l TDS} \end{aligned}$$

That is, the additional treatment plant flow would increase the TDS in the river by 55 mg/l downstream of the seep, the downstream TDS concentration would be 1,555 mg/l, and, as above, a mixing zone would be viable. As indicated in Kerr-McGee's Permanent NPDES Discharge Permit application, submitted September 17th, the mixing zone application will be forwarded to your office as it completed.

Once again, Kerr-McGee appreciates your efforts on this project and would like to meet with you to discuss these permitting topics. I will call you to set up a time convenient. If you have any questions please feel free to call me at (702) 651-2234. Thank you.

Sincerely,



Susan M. Crowley
Staff Environmental Specialist

Enclosures: Temporary Discharge Permit Application

Check No. 07807

By Airborne Express

cc: LKBailey
PSCorbett
K Dhrberg
WOGreen
JTSmith
EMSpore
FRStater
Bill Gorham, ENSR
Rick Simon, ENSR
Dave Urban, ENSR
Mark Warner, ENSR
Doug Zimmerman, NDEP
Brenda Pohlmann, NDEP

LIST OF REQUIREMENTS FOR TEMPORARY PERMIT APPLICATION

A temporary permit may be issued for a maximum of a 180 day (6 month) period of time, pursuant to NRS 445A.485, after which time the discharge shall cease or the discharger shall have applied for and received a Permanent Discharge Permit. A \$250.00 fee is due at the time of application.

I. Owner Information

Name: Kerr-McGee Chemical LLC
Address PO Box 55
City Henderson County Clark
State Nevada Zip Code 89009
Telephone Number (702) 651-2234 Fax Number (702) 651-2310
Contact Person Susan Crowley

II. Facility/Site Information

Facility Name Kerr-McGee Chemical LLC
Facility Address 8000 West Lake Mead Drive
City Henderson County Clark
State Nevada Zip Code 89015
Telephone Number (702) 651-2234 Fax Number (702) 651-2310
Contact Person Susan Crowley
Latitude 36 deg., 5 min., 15 sec Longitude 114 deg., 59 min., 30 sec
Township 21S Range 63E
Section 30

III. Receiving Water Name Las Vegas Wash

If the discharge enters a separate storm water drainage or other system, please provide the following information:

- the name of the owner of the drainage
- The name of the receiving water into which the drainage system discharges; and
- A copy of the permit, license, or equivalent written approval granted by the owner of the system for such a discharge or connection to the system

IV. A narrative description of the site & activities which require the discharge permit. Describe any treatment system and/or Best Management Practices to be used at the facility.

Please see attached sheet.

V. Water Quality Analysis (must use a Nevada State Certified Lab) to include the potential contaminants/pollutants in the discharge.

Please see attached sheet.

VI. Quantity of discharge: Flow (gallons per day) 1,440,000 gpd (1,000 gpm)

VII. Attach a topographic map and a site map showing the location of the potential discharge and a line drawing showing the general route taken by water in the facility from intake to discharge.

VIII. Existing Environmental Permits

NPDES Permit (Discharges to Surface Water) NV0000078

NEV Permit (Discharges to Ground Water) N/A

IX. I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Fredrick R. Stater

Plant Manager

Printed Name of Person Signing

Title

Fredrick R. Stater

October 21, 1999

Signature of Applicant

Date Application Signed

**Kerr-McGee Chemical LLC
Temporary (360 gpm seep) Discharge
Permit Application**

Additional Information

Attachments

Item IV Narrative Description
Ion Exchange System
Biodegradation System

Item V Water Quality Analysis

Figures

Figure 1 Site Location Map
Figure 2 Process Flow Diagram – Ion Exchange System
Figure 3 Process Flow Diagram – Biodegradation System

Item IV Narrative Description

This National Pollution Discharge Elimination System (NPDES) temporary permit application package is submitted to the Nevada Division of Environmental Protection (NDEP) for discharges from a proposed surface water treatment system operated by Kerr-McGee Chemical LLC (Kerr-McGee) in Clark County, Nevada (Figure 1, Site Location Map). In July 1999, Kerr-McGee and NDEP entered into a Consent Agreement regarding near-term and long-term reduction in the amount of perchlorate reaching the Las Vegas Wash and Lake Mead. Groundwater in the area has elevated levels of perchlorate and other constituents. This groundwater seeps to the surface into a short creek along the southern edge of the Las Vegas Wash. This temporary permit application describes a two-phased approach to remove perchlorate from the seep water prior to its entering the Las Vegas Wash. Initially ion exchange technology will be used to selectively remove perchlorate from the seep water. However, once the biological treatment system is operational, the perchlorate removal will be accomplished by this latter system.

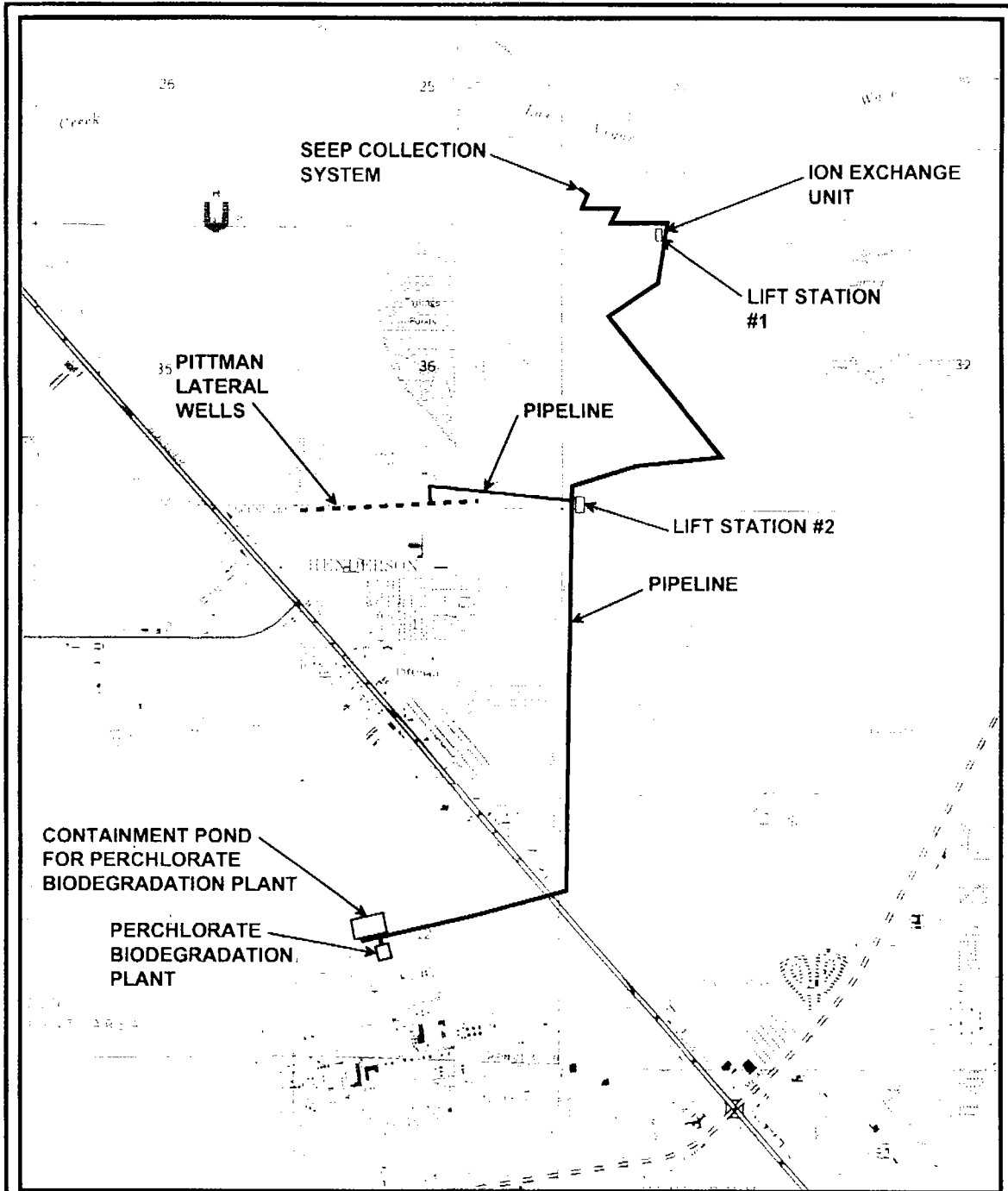
Ion Exchange System

Kerr-McGee has identified a removal technology that is capable of meeting the treatment objectives specified in the Consent Agreement in the short-term. The selected treatment technology to initially remove perchlorate from the surface water is an ion exchange system. Bench testing of this technique has demonstrated that the anticipated 97 percent reduction in perchlorate is feasible.

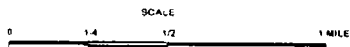
Water flowing from the seep will be collected in a weir-sump combination and pumped, using a sump pump, to a lift station located on BMI property. This conveyance will be by buried corrosion resistant pipeline.

The lift station is designed to hold and store a sufficient volume of water to allow for variations in processing of water by an ion exchange system. Pumps of sufficient capacity will be used to convey the water from the lift station to filters to remove particulate material and then to the ion exchange system. The ion exchange system will be contained and will be used to remove the perchlorate ion from the water. The treated water will be conveyed, via a corrosion-resistant return pipeline, to the downstream side of the weir-sump collection system for discharge. The water will be discharged to the Las Vegas Wash streambed in a non-erosive mode.

Once the ion exchange media is saturated with perchlorate, the resin will be managed in accordance with applicable regulations. It is expected that there will be multiple trains of ion exchange media for processing of this stream. Figure 2 is a process flow diagram for the ion exchange system.



SOURCE: USGS 7.5 Minute Topographic Quadrangles,
Las Vegas SE and Henderson, Nevada



ENSR

FIGURE 1
SITE LOCATION MAP

Kerr-McGee
Henderson, Nevada

Drawn by: M. Scoop

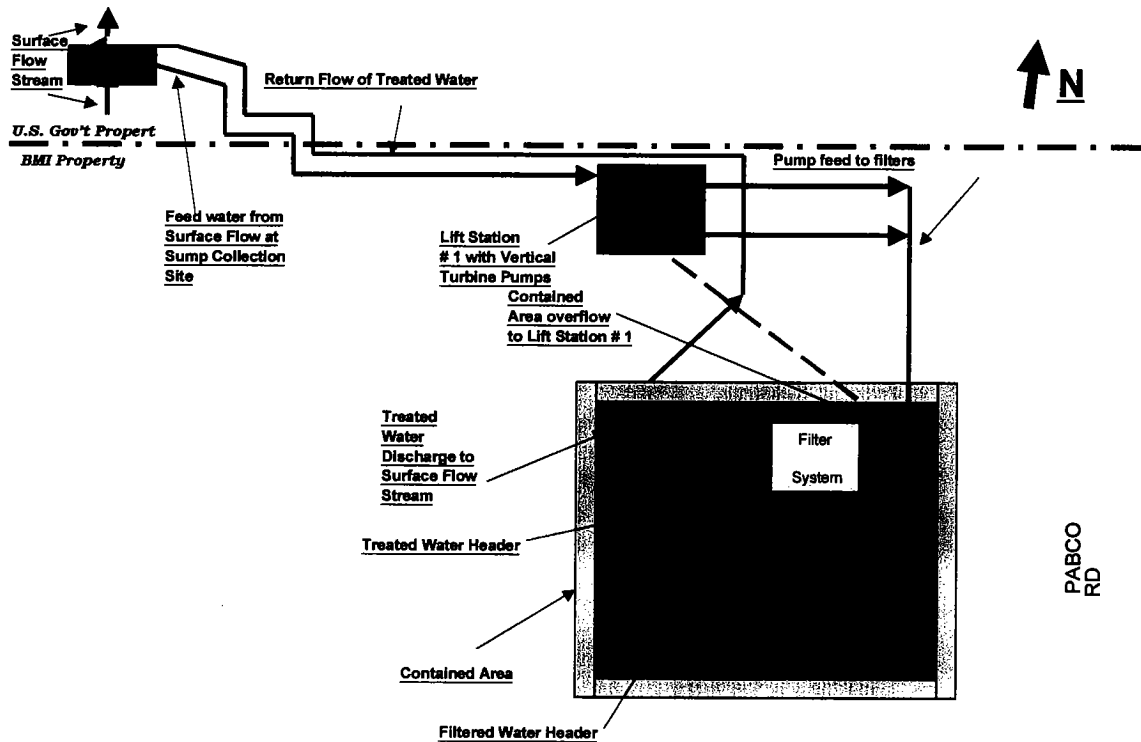
Date: 9/9/1999

Project number

4020-010-200

Figure Name: 010-200a.dsf

Checked by:



Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 2 Process Flow Diagram – Ion Exchange System

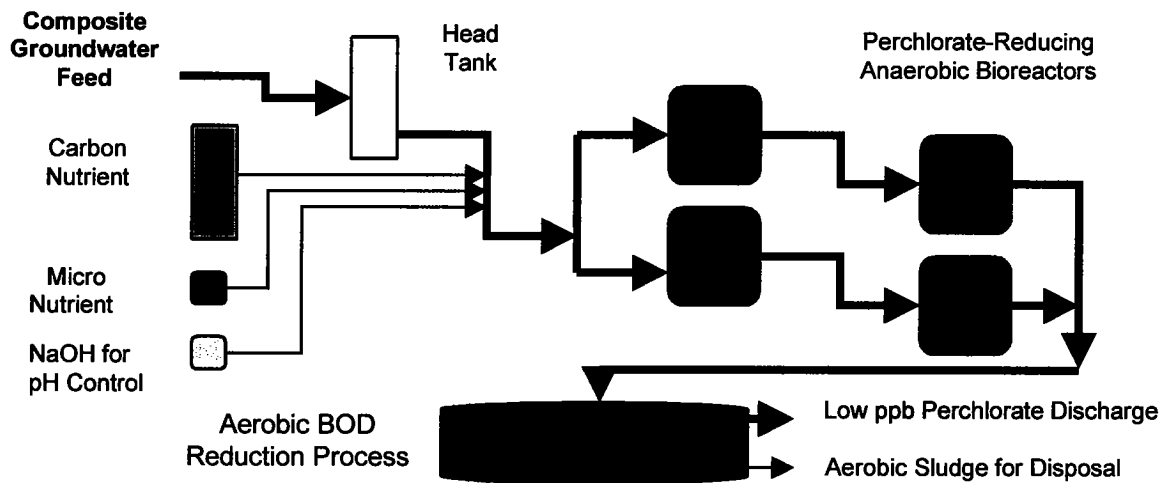
Biodegradation System

As soon as the biodegradation system is constructed and operational, the ion exchange unit will be decommissioned and the flow will be directed to the biodegradation system. In the biodegradation system, perchlorate is reduced to chloride in an anaerobic/anoxic biodegradation process. Chlorate and nitrate are simultaneously destroyed. The addition of nutrients in this process increases the biochemical oxygen demand (BOD), which is removed by subsequent conventional aerobic treatment. Perchlorate-containing water from the seep, at an average flow of 360 gallons per minute (gpm), will be pumped to a holding pond (aquifer retention basin), then into a receiver/head tank. This tank will function as a mix tank and will be designed to enable gravity flow to the rest of the process. In the event of a process interruption, water flow will automatically be diverted from the head tank to the containment pond. Figure 3 is a process flow diagram for the biodegradation system.

Nutrients, including a carbon source, are required for this biological process to work effectively. Various carbon-based nutrients have been identified that are commercially available as food process byproducts. The selected nutrients will be stored in bulk tanks or a railcar and be metered into the bioreactors. Micronutrients (phosphorus, nitrogen) will also be prepared, stored, and fed to the bioreactors. Control of pH in the reactors is necessary to maintain effective performance. Caustic (25 percent NaOH) will be used to maintain the pH.

The reactor vessels are designed as continuous-stirred-tank-reactors (CSTR) operated in series. Two trains of two reactors in series enhances the safety and robustness of this process by: 1) reducing tank size and containment considerations, 2) providing redundant process train, and 3) providing a second stage of treatment to ensure perchlorate reduction.

The BOD and total suspended solids (TSS) of the effluent anaerobic reactors will be reduced by subsequent conventional aerobic treatment prior to discharge. A small amount of aerobic sludge (biomass) will be generated as a result of this process. This sludge will be filtered and managed in accordance with applicable regulations.



Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 3 Process Flow Diagram – Biodegradation System

Source: Applied Research Associates, Inc.

Item V Water Quality Analysis

Data on water quality from samples analyzed by a Nevada certified lab are being obtained. They will be forwarded to the NDEP once they are validated.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

October 21, 1999

Mr. Doug Zimmerman, Chief
Bureau of Corrective Actions
Nevada Department of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

Dear Mr. Zimmerman:

Thank you for providing us the opportunity to review and comment on the **Work Plan for the Long-Term Ground Water Perchlorate Removal Action Henderson, Nevada** submitted to NDEP from Kerr McGee Chemical Corporation (KMCC) and dated September 25, 1999. The following comments are provided for your review and consideration:

1. EPA would again like to express some general concerns regarding the content and scope of the Consent Agreement signed July 28, 1999 between NDEP and KMCC and its implementation through the approval of workplans. The agreement does not specifically direct KMCC to address the remaining approximately 50 percent of the perchlorate load that is reaching Las Vegas Wash via the ground water pathway. This effort should be concentrated in the areas immediately adjacent to the wash mainly upstream of the identified surface discharge. This of great importance since interception and treatment of perchlorate in this area would result in the most immediate improvement in water quality in Las Vegas Wash and Lake Mead. Another concern is the reliance of the Consent Agreement on the submission of workplans rather than direct implementation of cleanup requirements. This, in combination with the lack of specific requirements and schedules may render the Consent Agreement unenforceable. These issues should be addressed in the revised Consent Agreement to be negotiated to implement the provisions of the September 25, 1999 Workplan.
2. The workplan cites a number of issues such as issuance of necessary permits, inclement weather, the untried nature of the proposed biodegradation technology to be used to treat perchlorate, etc. that could conceivably cause delays in the progress of the perchlorate remediation effort. KMCC needs to proceed as quickly as possible to implement the requirements of the Consent Agreement. Problems that are encountered will be dealt with on a case by case basis. A contingency plan should be included in the workplan in case the biodegradation technology prove to be ineffective.
3. Page 1-3, Section 1-2 (Objectives)- As stated in this section, Section 11.3 of the Consent Agreement directs Kerr McGee (KMCC) to address perchlorate remediation at the Pittman Lateral. This should be clearly defined in the Objectives portion of the workplan.

4. Page 2-1- It is not clear what rationale was used to pick the wells to be used for the extraction of ground water at the Pittman Lateral. A principle criteria that should be used when deciding how to most effectively remove ground water containing perchlorate would be to pick those wells with the highest levels of perchlorate and that exhibit the highest well efficiency (pumping/drawdown ratio). Data from the recently conducted pump test at the Pittman Lateral could be used to make this determination. Is KMCC still committed to beginning full pumping operations at the Pittman Lateral by December 31, 1999? A definite start up date should be included in the workplan.

5. Page 2-2, second paragraph- Is the northern boundary area of KMCC property described here a proposed fourth area of ground water extraction? Figure 2.1 does indicate an additional line of extraction wells in this area. If this is proposed, the purpose and rationale should be explained.

6. Page 2-2, third paragraph- A ground water monitoring and reporting plan should be designed and implemented to determine the effectiveness of the remediation efforts. A set of wells should be agreed upon by all parties for this purpose. Plume concentration contour and ground water flow maps should be produced at regular intervals to assist in the evaluation. A series of regularly scheduled meetings/conference calls should be held to evaluate the effectiveness of the remediation effort and allow for immediate adjustments to be made in the program, if needed. Included in this monitoring program should be periodic sampling from Las Vegas Wash along its length adjacent, above and below the Pepcon and KMCC properties to look for changes in perchlorate concentrations.

7. Page 2-2, third paragraph- A ground water extraction reporting requirement should be added to document the accomplishments and effectiveness of KMCC's remediation efforts. For each ground water extraction line or surface water discharge collection point, KMCC should provide at least quarterly reports on the amount of ground water captured and treated, the concentrations of perchlorate in the water, the treatment method and effectiveness, the overall capture efficiency of the extraction or collection, etc.

8. Page 2-2, third paragraph- More specifics are needed as to what constitutes a sufficient decrease in perchlorate concentrations in the downgradient seep, such that if that concentration were attained, the treatment would end. A determination of when to permanently discontinue pumping/treatment of perchlorate should be based on perchlorate concentrations in a number of wells that help define the perchlorate plume monitored over time. It also seems appropriate that NDEP and EPA be involved in any such determination.

9. Other sources of ground water daylighting near Las Vegas Wash need to be included in the investigation of perchlorate migration pathways to Las Vegas Wash, since the identified surface discharge only accounts for approximately 50 percent of the perchlorate load entering Las Vegas Wash. If no other seeps/ground water discharges can be identified adjacent to the wash, then ground water extraction wells should be installed in this area to intercept the ground water and bring that water to the biological treatment plant.

10. A nine month construction duration is estimated for the Biological Treatment Plant (a target date is not given for completion of construction). This length of time appears reasonable but a

completion date should be assigned for compliance purposes.

EPA appreciates the opportunity to work with NDEP as we continue to make progress towards the goal of remediation of perchlorate in Las Vegas Wash and Lake Mead.

Sincerely,

A handwritten signature in cursive script that reads "Larry Bowerman".

Larry Bowerman, Chief
Corrective Action Office

cc: Julie Anderson, EPA
Keith Takata, EPA
John Kemmerer, EPA
Kathi Moore, EPA
Dave Seter, EPA

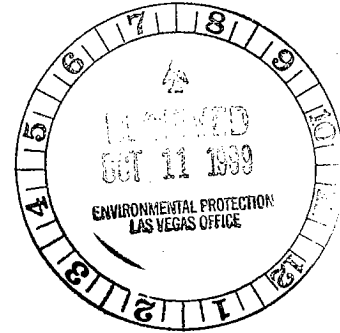


KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

October 7, 1999

Doug Zimmerman, Bureau Chief
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710



Dear Mr. Zimmerman:

Subject: Perchlorate Removal Action

Kerr-McGee Chemical LLC (Kerr-McGee) signed a Consent Agreement, executed on July 28, 1999, which requires measures to implement capture and control of a groundwater seep identified in the Las Vegas Wash area. In that agreement, Kerr-McGee anticipated a recovery initiation in October 1999.

Earlier permitting delays subsequently delayed construction completion from October 1999 to November 7. This information was transmitted to your office in a September 17 correspondence. At this time, a series of small additional delays have collectively resulted in construction completion delay of an additional 6 days. These individually are:

- ❖ USBR Site Access approval delayed by one day.
- ❖ 401 Water Quality Certification and Rolling Stock Permit delayed by 2 days.
- ❖ City of Henderson Land Use Permit and Grading Permit delayed by 3 days.

Considering these small delays, construction completion is anticipated on November 13.

Please feel free to call me at (702) 651-2234, if you have any questions.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
LKBailey
EMSpore
FRStater
WOGreen
JTSmith
Rick Simon, ENSR
Brenda Pohlmann, NDEP



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

October 6, 1999

Mr. Robert Kelso
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Kelso:

Subject: KMCLLC Environmental Conditions Investigation Quarterly Report

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Kerr-McGee Chemical LLC (KMCLLC), formerly Kerr-McGee Chemical Corporation (KMCC), enclosed is the quarterly progress report for the KMCLLC Henderson Environmental Conditions Investigation.

Activities Conducted 07/01/99 to 09/30/99

- A report, describing field activities associated with the KMCLLC's Supplemental Phase II Sampling Plan, is under development.
- KMCLLC continued BMI Common Areas investigative work, including evaluation of TDS and organic groundwater impact, in cooperation with other HISSC members.

Please feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc:	PSCorbett	MJPorterfield
	TWReed	RSimon (ENSR)
	WOGreen	JTSmith (Covington & Burling)
	RHJones	Doug Zimmerman (NDEP)
	FRStater	Tom Whalen (NDEP)

MONITOR WELL NUMBER	REFERENCE CASING ELEV., MSL	GROUND ELEV., MSL	*CASING STICKUP FT.	*DRILLED WELL DEPTH FT.	**MEASURED WELL DEPTH FT. TO 100'	*SCREENED INTERVAL, FT	CASING TYPE AND SIZE IN.	DATE WELL DRILLED	*DEPTH TO TOP OF MUDDY CREEK FT	ELEV. OF MUDDY CREEK MSL	*DEPTH TO GW FT. 6/85	WATER-TABLE ELEVATION MSL, 6/85	SATURATED AQUIFER THICKNESS FT, 6/85	CHROMIUM CONCENT. mg/l 6/85	GW COND. 2 umhos/cm 6/85	**DEPTH TO WATER, FT TOC, 6/85
M-24	1788.54	1786.34	2.20	40.0	42.69	25-40	2" PVC	5/14/84	36.0	1750.3	37.9	1748.4	-1.9	1.1	4,200	40.13
M-25	1756.81	1753.79	3.02	40.0	41.47	25-40	2" PVC	5/14/84	28.0	1725.8	21.9	1731.9	6.1	12.9	14,000	24.94
M-26	---	1748.94	---	40.0	---	25-40	2" PVC	5/14/84	35.0	1713.94	---	---	---	---	---	---
M-27	1741.28	1739.46	1.82	35.0	30.92	20-35	2" PVC	5/14/84	>40.0	<1699.5	13.2	1726.4	>26.9	2.6	10,100	14.88
M-28	1811.27	1811.1	-24	50.5	47.61	30-50	2" PVC	7/23/85	31.0	1780.5	43.0	1768.5	-12.0	<0.1	6,700	42.78
M-29	1806.60	1806.24	0.36	42.0	41.74	42-27	2" PVC	7/12/85	21.0	1785.2	36.1	1770.1	-15.1	0.1	34,600	36.48
M-30	1810.68	1810.88	-20	46.50	43.32	45-30	2" PVC	7/17/84	25.0	1785.9	39.0	1771.9	-14.0	0.6	5,500	38.80
M-31	1787.92	1785.54	2.38	45.0	47.60	30-45	2" PVC	6/85	35.0	1750.5	35.0	1750.5	0.0	10.4	11,000	37.36
M-32	1787.48	1785.63	1.85	45.0	46.76	30-45	2" PVC	"	34.0	1751.6	33.4	1752.3	0.6	1.3	8,900	35.22
M-33	1786.98	1785.03	1.95	45.0	46.78	30-45	2" PVC	"	35.0	1750.0	32.2	1752.8	2.8	0.1	7,200	34.15
M-34	1776.10	1774.25	1.85	40.0	41.83	25-40	2" PVC	"	35.0	1739.3	29.3	1745.0	5.7	2.2	7,800	31.10
M-35	1775.01	1773.11	1.90	40.0	42.33	25-40	2" PVC	"	33.5	1739.6	27.1	1746.1	6.4	0.6	6,500	28.95
M-36	1758.88	1756.03	2.85	35.0	37.85	20-35	2" PVC	"	27.5	1728.5	21.2	1734.8	6.3	2.0	13,100	24.08
M-37	1759.58	1757.43	2.15	35.0	37.18	20-35	2" PVC	"	27.0	1730.4	23.1	1734.3	3.9	0.3	20,000	25.27
M-38	1759.08	1756.48	2.60	35.0	37.44	20-35	2" PVC	"	28.0	1728.5	21.9	1734.6	6.1	5.3	9,100	24.52
M-39	1760.22	1757.62	2.60	40.0	42.60	20-35	2" PVC	"	34.0	1721.6	19.4	1738.3	14.6	2.0	8,500	21.97
M-40	1797.89	1795.49	2.40	45.0	47.40	30-45	2" PVC	"	32.0	1763.5	37.5	1758.0	-5.5	2.5	11,200	39.93
M-41	1695.60	1693.03	2.57	35.0	37.52	5-35	2" PVC	7/85	24.5	1668.7	3.5	1690.1	22.4	2.9	11,000	7.04
M-42	1696.24	1693.64	2.60	35.0	37.02	4.4-34.4	2" PVC	"	26.0	1667.7	3.5	1688.6	20.0	1.7	10,100	6.16
M-43	1696.16	1693.52	2.64	35.0	37.56	4.9-34.9	2" PVC	"	24.5	1669.0	4.9	1688.6	19.6	0.85	10,500	7.53
M-44	1696.74	1694.19	2.55	35.0	37.65	5.1-35.1	2" PVC	"	20.0	1674.2	10.0	1684.2	10.0	0.38	9,500	12.58
M-45	1697.13	1694.73	2.40	35.0	36.59	4.2-34.2	2" PVC	"	27.0	1667.7	15.3	1679.4	11.9	0.04	4,625	17.74
M-46	1716.08	1713.34	2.74	45.0	46.89	4.2-44.2	2" PVC	"	41.0	1672.3	8.7	1704.6	32.3	1.8	9,600	11.46
M-47	1715.04	1712.50	2.54	45.0	42.59	0.1-40.0	2" PVC	"	42.0	1670.5	9.2	1703.3	32.8	5.1	12,900	11.79
M-48	1719.05	1716.60	2.45	35.0	38.59	6.1-36.1	2" PVC	"	32.0	1684.6	7.3	1709.3	24.7	1.3	11,900	9.78
M-49	1718.89	1716.35	2.54	45.0	46.50	4.0-44.0	2" PVC	"	36.0	1680.4	8.5	1707.9	27.5	1.5	6,400	11.02
M-50	1793.87	1791.27	2.60	60.0	62.15	39.6-59.6	2" PVC	"	40.0	1751.3	43.5	1747.8	-1.5	10.0	7,200	46.08
M-51	1695.34	1692.66	2.68	35.0	36.62	3.9-33.9	2" PVC	"	26.0	1666.7	4.0	1688.7	22.0	1.7	10,000	6.68
M-52	1798.72	1795.84	2.88	45.0	47.38	34.5-44.5	2" PVC	"	32.0	1763.8	38.5	1757.3	-6.5	1.5	---	41.38

NOTE: All data collected from wells M-41 through M-52 were collected in late July, 1985.

From: tholsen @ redrock.net (Ted Olsen)
To: Brenda Pohlmann
Subject: Re: perc

===NOTE=====9/30/99==8:01am=====

> From: Brenda Pohlmann <bpohlman.ndep-lv@ndep.carson-city.nv.us>
> To: "Ted. Olsen" <tholsen@redrock.net>
> Subject: perc
> Date: Tuesday, September 28, 1999 9:32 AM
>
> ===== Original Message =====
> Can you help me with the details on agreement with Kerr McGee to
intercept
> and treat groundwaters heavily contaminated with perchlorate from
entering
> Colo River tributary You can reach me by email or at 435 673-5601
voice/fax
> Appreciate any help Ted Olsen, Defense Cleanup writer
> ===== Fwd by: Brenda Pohlma =====
> I am in the office today. What kind of information are you looking for?

Hi Brenda Thanks for faxing all that good information on the perchlorate project It'll make a great story for us Couple of questions: Can you tell me more about the Pittman Lateral area Are these existing or will these be new wells and if so will they be conventional horizontal an not lateral wells? Do you expect that an exclusion will be granted or will there have to be an EA which I would assume means more delays? I take it from the section on project team and description that Kerr-McGee will be the operator and won't be hiring a contractor Is that correct? Who are PBS & J and Pentacore? It interests me also that Kerr-McGee plans to seek funding help from the Navy which is a previous operator Can you tell me anything more about this? Finally, I figure from the project that the biodegradation facility will be operating by the third quarter 2000 but I can't find anything about when the ion exchange unit will be completed Can you help me there and can you tell me where they're getting the ion exchange? Thanks for all the help Ted Olsen, Defense Cleanup
>

=====ATTACHED=FILE(S)=====
File(s):ONAME01.HTML
Detach to:J:\USERS\BPOHLMAN\WINUSER

KMEC Update

9/22/07

Rick Simons ENR

Everett Spore KMEC

Susan Crowley KMEC

Doug Zimmerman NDEP

Pat Corbett KMEC

B. Poleman NDEP

Still waiting for response from BOR - BOR has stated they will respond by Friday.

Working on NPDES permit. May have to get 1 or 2 temporary permits before receiving final permanent permit. LIT + lindane above chronic stds for waste but below acute.

Call Bureau of Rec - Pat Green or Dave Curtis

Work plan due soon for long-term protection based on Consent Agreement.



KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

September 22, 1999

Doug Zimmerman, Bureau Chief
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Zimmerman:

Subject: Perchlorate Removal Action

Kerr-McGee Chemical LLC (Kerr-McGee) signed a Consent Agreement, executed on July 28, 1999, which requires measures to implement capture and control of a groundwater seep identified in the Las Vegas Wash area. In that Agreement, Kerr-McGee anticipated a recovery initiation in October 1999.

To meet that October 1999 date, site access on US Bureau of Reclamation (USBR) property was required by September 17, 1999, to begin field construction activities. Application to obtain the USBR site access was filed August 5, 1999. Kerr-McGee met with representatives of USBR on September 17 and learned that review of Kerr-McGee's access application will not be complete until at least September 24, 1999. This will represent at least a one-week delay in the construction schedule, which will in turn represent at least a one-week delay in the anticipated recovery initiation. The current anticipated recovery initiation date is November 7, 1999, assuming all other necessary governmental approvals are received in a timely manner.

Please feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By Airborne Express

cc: PSCorbett
LKBailey
EMSpore
FRStater
WOGreen
JTSmith
Rick Simon, ENSR
Brenda Pohlmann, NDEP



June 15, 1999

Ms. Felicia Marcus
 Region IX Administrator
 United States Environmental Protection Agency
 75 Hawthorne Street
 San Francisco, CA 94105-3901

Dear Administrator Marcus:

Perchlorate Contamination of the Colorado River

The Association of California Water Agencies (ACWA) includes 450 public water agencies in California. Our members serve over 90% of the delivered water in California for domestic, agricultural, and industrial uses. The Colorado River plays a major role in meeting these water supply demands.

ACWA has been actively tracking the issue of perchlorate contamination in the Colorado River. Many of ACWA's member agencies, including some of the largest water suppliers in the state, have been impacted by the perchlorate contamination emanating from the Las Vegas Wash and flowing into Lake Mead. The recent addition of perchlorate to the unregulated contaminant monitoring list by the California Department of Health Services will undoubtedly reveal even more contamination than previously known.

ACWA commends the U.S. Environmental Protection Agency, Region IX (Region IX) for its efforts to address the perchlorate contamination problem in the Colorado River. Region IX, along with the State of Nevada and many California water utilities, have committed considerable resources to investigating the source of contamination, clean-up of the contamination, health effects of perchlorate, analytical methods, and drinking water treatment technologies. We understand that Region IX and the State of Nevada would like to see immediate action taken to intercept groundwater flows beneath the Kerr-McGee property before it reaches the Las Vegas Wash and to intercept a surface water flow into the Las Vegas Wash that was recently discovered. ACWA supports immediate action in these areas to reduce further perchlorate contamination.

Recent meetings between Region IX staff and Metropolitan Water District of Southern California staff stimulated ideas on additional proactive measures that could be implemented. As a result, ACWA believes the following additional actions could greatly improve the understanding of perchlorate contamination in the Colorado River:

Association of California
 Water Agencies
 10 K Street, Suite 100
 Sacramento, California
 5814-3512

16441-4545
 x 916/325-4849
 www.acwanet.com

202/434-4760
 202/434-4761

202/434-4760
 202/434-4761

- 1) A comprehensive assessment (by the U.S. Geological Survey) of the time needed for the Colorado River system to "flush itself out" once the source of perchlorate has been eliminated; and
- 2) Additional monitoring for perchlorate for the purpose of tracking the plume and assessing clean-up efforts.

These tools will provide a better understanding of how the clean-up efforts *should* improve conditions and real results to assess the clean-up measures. We recommend that these items be placed high Region IX's "priority" list for the perchlorate assessment.

ACWA and affected members would be more than happy to discuss these issues in more detail if needed. If you have any additional questions or would like to discuss things further, please feel free to contact Krista Clark at 916-441-4545.

Sincerely



Dan Smith
Manager of Regulatory Affairs

cc: Mark Beuhler, MWD of SC
Bob Martin, East Valley WD



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

TBM

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

SEP 27 99

September 21, 1999

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) activities regarding the perchlorate issue:

❖ Seep Removal Action

- Site Access Application was filed with the US Bureau of Reclamation (USBR) in August 1999. Kerr-McGee has met with the USBR several times in order to expedite the application review. The following activities were completed to support the application and submitted to the USBR on September 10:
 - Project Environmental Assessment
 - Biological Assessment
 - Cultural Assessment – While this assessment was completed, USBR requires that an archeologist be available during the brush clearing that will be needed as the site is prepared for installation of the sump.
 - Jurisdictional Assessment

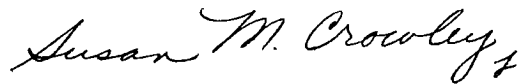
USBR has not allowed any pre-approval site preparation. Their review should continue until at least September 24. At that time, they will better understand their obligations for Indian tribal consultation and either grant site access or begin the tribal consultation. Following site access approval, construction will require at least 7 weeks.

- Water Appropriation Permit – Kerr-McGee filed an application requesting approval to appropriate approximately 400 gpm on June 8. Approval of the application is pending review by the Nevada State Engineer's office.
- NPDES Discharge Permit – After several meetings with Nevada Division of Environmental Protection (NDEP) – Bureau of Water Pollution Control to discuss the approach, an NPDES permit application was filed with NDEP on September 17. A meeting has been scheduled between Kerr-McGee and NDEP to expedite information transfer and facilitate NDEP review of the application.
- Construction Permits (including permits for Use, Building, Power Installation, Right-of-Way, etc.) are under development. At this time, none are expected to cause a construction delay.
- Private Property Easement Agreements – These are under development. At this time, none are expected to cause a construction delay.

- Ion-exchange technology (IX) has been chosen to treat the collected seep surface flow on a short-term basis. Short-term treatment equipment, utilizing IX, will be installed close to the seep collection location.
- ❖ A Work Plan to cover the long-term remedial alternative for capture and treatment of perchlorate-impacted groundwater is under development.

KMC is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,



Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
TWReed
WOGreen
RHJones
LKBailey
ALDooley
Rick Simon, ENSR
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

September 17, 1999



Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: NPDES Permit Application for Perchlorate Removal Action

Dear Ms. Pool:

Please find attached two copies of an NPDES Permit application for the Kerr-McGee Chemical LLC (Kerr-McGee) perchlorate removal action.

Kerr-McGee is scheduled to meet with your office on Tuesday, September 21, 1999 at 10:30 am to discuss this application. If you have any questions prior to that time please feel free to call me at (702) 651-2234. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

smc/NPDES App Cvr Ltr.doc

cc: LKBailey
K Dhrberg
PSCorbett
EMSpore
FRStater
Brenda Pohlmann, NDEP
Rick Simon, ENSR

Kerr-McGee Chemical LLC

Henderson, Nevada



**National Pollution Discharge
Elimination System (NPDES)
Permit Application Perchlorate
Removal Action, Henderson,
Nevada**

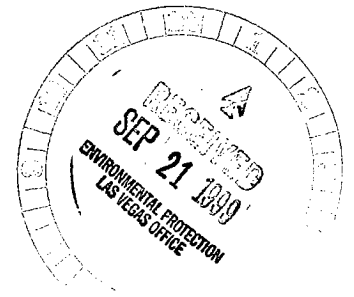
ENSR

September 1999

Document Number 4020-011-100

**National Pollution Discharge Elimination System
Permit Application Perchlorate Removal Action,
Henderson, Nevada**

ENSR Document No.: 4020-011-100
September 1999



Prepared for
Kerr-McGee Chemical LLC
Henderson, Nevada

ENSR
1220 Avenida Acaso
Camarillo, California 93012

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1.0 INTRODUCTION

This National Pollution Discharge Elimination System (NPDES) permit application package is submitted to the Nevada Division of Environmental Protection (NDEP) for discharges from a proposed groundwater treatment system operated by Kerr-McGee Chemical LLC (Kerr-McGee) in Clark County, Nevada. Kerr-McGee and NDEP in July 1999 entered into a Consent Agreement regarding near-term and long-term reduction in the amount of perchlorate reaching the Las Vegas Wash and Lake Mead. Groundwater in the area has elevated levels of perchlorate, and this permit application describes a two-phased approach to perchlorate removal efforts. The initial treatment stage will utilize ion exchange technology, and long-term removal will be provided by a biological treatment system.

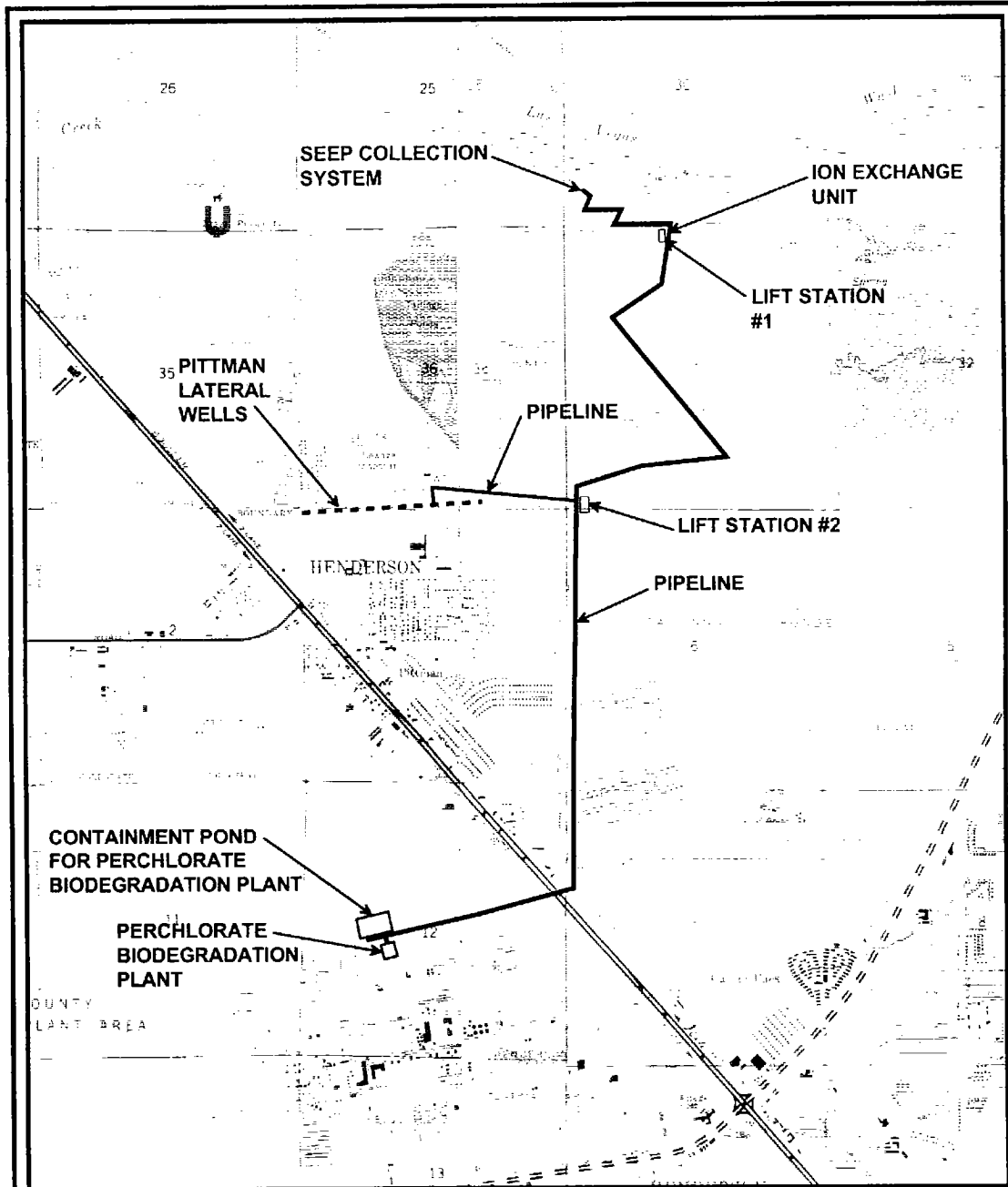
2.0 PROJECT BACKGROUND

Kerr-McGee has owned and operated a perchlorate production plant near Henderson, Nevada since 1967. See Figure 2-1, Site Location Map. The United States Navy and others previously owned the facility for the manufacture of perchlorate products and intermediates. Pacific Engineering and Production Co. of Nevada (PEPCON) also produced perchlorate at a site southwest of Kerr-McGee's facility. Samples taken at the Kerr-McGee and PEPCON sites (and in nearby areas) have shown elevated levels of perchlorate present in groundwater. The perchlorate contamination is presumed to be the result of historical operations at the perchlorate production facilities in the area.

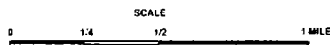
Kerr-McGee has been cooperating with the NDEP in the delineation of perchlorate in groundwater and in the investigation of appropriate and feasible means to remediate this contamination. On July 28, 1999 Kerr-McGee and NDEP entered into a Consent Agreement in compliance with Nevada Water Pollution Control Law, Nevada Revised Statutes § 445.131 to 445.354 inclusive; to institute groundwater remediation measures. The Consent Agreement requires Kerr-McGee to implement remediation in two phases:

- (1) In order to reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term, immediate efforts must be taken to capture and treat contaminated groundwater surfacing north of the BMI lower ponds and adjacent to the Las Vegas Wash (the seep); and
- (2) A plan must be implemented to achieve substantial, long-term remediation of groundwater contaminated with perchlorate in the vicinity of the Pittman Lateral area.

In the near term, Kerr-McGee is proposing to employ an ion exchange system to remove perchlorate in the seep. Long-term treatment of groundwater from the seep, Pittman Lateral, and the Kerr-McGee site will involve the use of a biological treatment system. Figure 2-1 shows the site locations of both systems. These proposed remediation technologies are described in more detail in Section 4.0, Treatment System Design.



SOURCE: USGS 7.5 Minute Topographic Quadrangles,
Las Vegas SE and Henderson, Nevada



**FIGURE 2-1
SITE LOCATION MAP**

Kerr-McGee
Henderson, Nevada

Drawn by: M Scop	Date: 9/9/1999	Project number 4020-010-200
Figure Name: 010-200a.dsf	Checked by:	

3.0 CHARACTERIZATION OF INTAKE AND RECEIVING WATERS

Intake water to the treatment system is a combination of surface water collected at the seep, well extraction water from the Pittman Lateral and well extraction water from the Kerr-McGee facility. The primary contaminant of concern is perchlorate, which varies in concentration from about 100 parts per million (ppm) in the seep to 350 ppm in the blended flow. Organic pesticides and herbicides from non-Kerr-McGee sources are also present in the intake water. Site-specific sampling and analysis is ongoing and will be submitted per the compliance requirements proposed in Condition I in Section 5.0.

The receiving water includes the water within the Las Vegas Wash. The water flowing in the Las Vegas Wash is composed primarily of treated effluent from the City of Las Vegas Water Pollution Control Facility, the Clark County Sanitation District Central Plant and Advanced Wastewater Treatment, and the City of Henderson WRF and Wastewater Treatment Plant. Other sources include excess irrigation water, permitted industrial discharges, stormwater, and groundwater discharges. As with the intake water, site-specific sampling and analysis is ongoing and will be submitted per the compliance requirements proposed in Condition I.

The beneficial uses of the Las Vegas Wash include irrigation, livestock watering, non-body Contact recreation, maintenance of a freshwater marsh, propagation of wildlife, and propagation of aquatic life. The water quality standards for the Wash are established in NAC 445A.199/201.

4.0 TREATMENT SYSTEM DESIGN

In the near term, the Consent Agreement states an objective for Kerr-McGee to remove at least 97 percent of the perchlorate from the groundwater seep prior to discharge. As stated earlier, Kerr-McGee is proposing to use an ion exchange system to remediate perchlorate contamination from the seep in the near term. Long-term treatment of groundwater from the seep, the Pittman Lateral area, and the Kerr-McGee site will involve the use of a biological treatment system. These systems are described below.

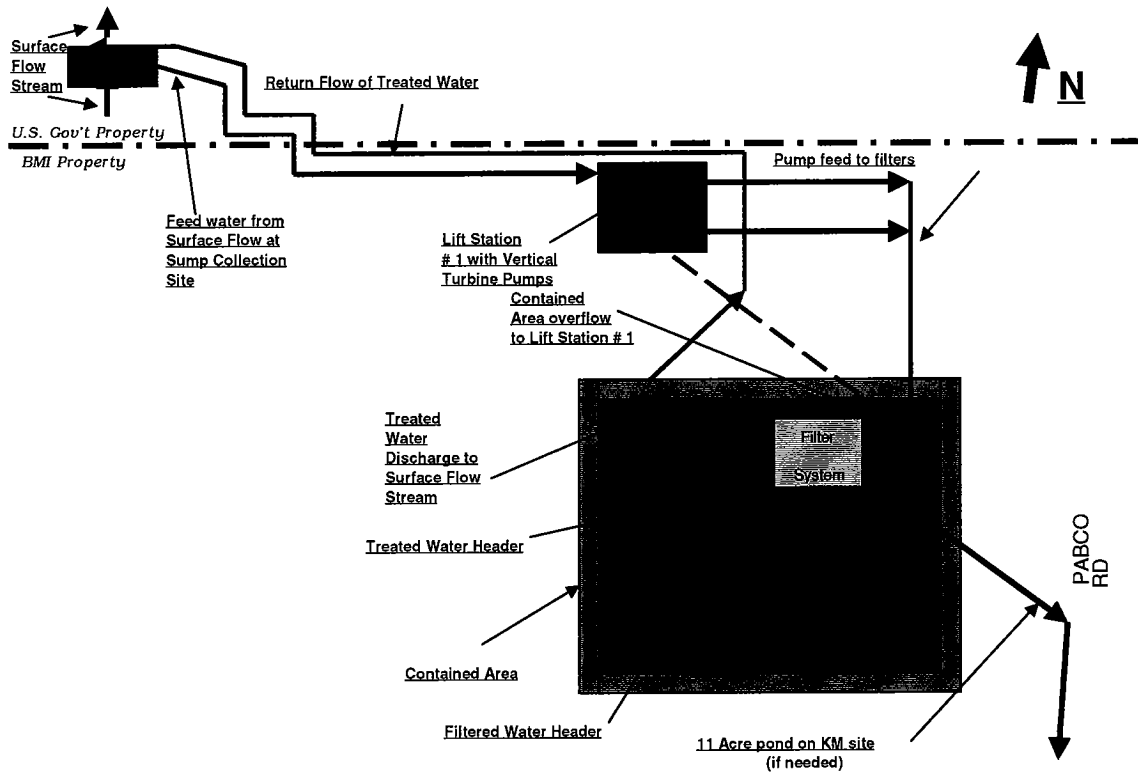
4.1 Ion Exchange System

Kerr-McGee has identified a removal technology that is capable of meeting the treatment objectives specified in the Consent Agreement. The selected treatment technology to remove perchlorate from the groundwater is an ion exchange system. Bench testing of this technique has demonstrated that the required 97 percent reduction in perchlorate is feasible.

Groundwater flowing from the seep will be collected in a weir-sump combination and pumped, using a sump pump, to a lift station located on BMI property. This conveyance will be by buried corrosion resistant pipeline.

The lift station is designed to hold and store a sufficient volume of water to allow for variations in processing of water by an ion exchange system. Pumps of sufficient capacity will be used to convey the water from the lift station to filters to remove the silt and particulate and then to the ion exchange system. The ion exchange system will be contained and will be used to remove the perchlorate ion from the water. The treated water will be conveyed to a return corrosion resistant pipeline, which in turn flows to the downstream side of the weir-sump collection system for discharge. The water will be discharged to the Las Vegas Wash streambed in a non-erosive mode.

Once the ion exchange media is saturated with perchlorate, the resin will be managed in accordance with applicable regulations. It is expected that there will be multiple trains of ion exchange media for processing of this stream. Figure 4-1 is a process flow diagram for the ion exchange system.



Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 4-1 Process Flow Diagram – Ion Exchange System

4.2 Biodegradation System

Perchlorate is reduced to chloride in an anaerobic/anoxic biodegradation process. Chlorate and nitrate are simultaneously destroyed. The addition of nutrients in this process increases the biochemical oxygen demand (BOD), which is removed by conventional aerobic treatment. Perchlorate-containing groundwater from multiple sources, at an average flow of 825 gallons per minute (gpm), will be pumped to the groundwater pond then into a receiver/head tank. This tank will function as a mix tank and will be designed to enable gravity flow to the rest of the process. In the event of a process interruption, groundwater will automatically be diverted from the head tank to the aquifer retention basin. Figure 4-2 is a process flow diagram for the biodegradation system.

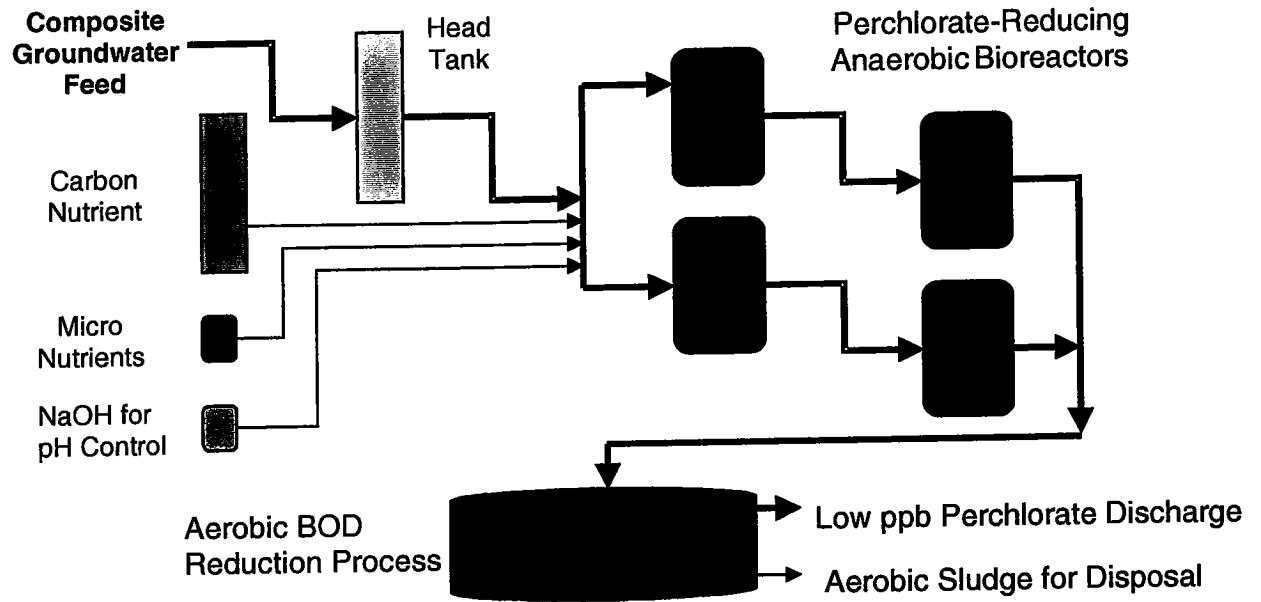
A carbon source is required for this biological process to work effectively. Carbon-based nutrients have been identified that are commercially available as food process byproducts. The nutrient will be stored in a bulk tank or railcar and be metered into the bioreactors. Micronutrients (phosphorus, nitrogen) will also be prepared, stored, and fed to the bioreactors. Control of pH in the reactors is necessary to maintain effective performance. Caustic (50 percent NaOH) will be used to maintain the pH.

The reactor vessels are designed as continuous-stirred-tank-reactors (CSTRs) operated in series. Two trains of two reactors in series enhances the safety and robustness of this process by: 1) reducing tank size and containment considerations, 2) providing redundant process train, and 3) providing a second stage of treatment to ensure even further reduction of perchlorate.

The BOD and total suspended solids (TSS) of the effluent anaerobic reactors will be reduced by conventional aerobic treatment prior to discharge. A small amount of aerobic sludge (biomass) will be generated as a result of this process. This sludge will be filtered and managed in accordance with applicable regulations.

4.3 Alternative Technologies Evaluation

The selection of ion exchange for an interim process and biological treatment as a long-term process was based on an evaluation of many technologies. Over ten technologies were screened for feasibility. The criteria used for evaluation included ability to remove greater than 97 percent of the perchlorate, commercial viability of the process, reliability and cost. Additionally, for the interim process, the feasibility to be fully operable within 60 days was required. Other technologies that passed the initial screen and were evaluated further were electrochemical reduction, reverse osmosis and mechanical vapor compression. Both the electrochemical reduction and reverse osmosis proved to be inadequate at removing sufficient perchlorate at low levels. Mechanical vapor compression showed carryover of perchlorate and was very costly. All three of these processes were evaluated, but determined to be impractical in the near or long term.



Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 4-2 Process Flow Diagram – Biodegradation System

Source: Applied Research Associates, Inc.

4.4 Mixing Zone Assessment

After treatment by technologies outlined in the preceding sections, certain parameters in the discharge will exceed or will have the potential to exceed the water quality standards for the Las Vegas Wash. Some of the parameters are expected to be addressed initially by the utilization of intake credits from intake water at the seep; however, extraction of well water at the Pittman Lateral and Kerr-McGee site may hamper the utilization of intake credits in the long term. These constituents and some of the conventional pollutants (such as manganese, total inorganic nitrogen, and total dissolved solids [TDS]) may require utilization of a mixing zone. Nevada regulations (NAC 445A) allow a zone of mixing in the receiving stream where water quality standards for individual parameters may be exceeded. In conversations between NDEP and Kerr-McGee, NDEP has supported the concept of a mixing zone and the utilization of the Las Vegas Wash flow.

The initial assessment of the feasibility of a mixing zone is very favorable. The minimum flow proposed for the Las Vegas Wash will be based upon the 1998 water year. Since the wash is comprised predominantly of municipal discharge, the minimum flow has been increasing in recent years and is projected to continue to increase. The 1998 water year data appears to be the proper basis. The minimum flow of the wash at the point the seep connects is conservatively estimated at 159.9 cubic feet per second. This is obtained by adding the annual seven-day minimum flows for the 1998 water year for the Las Vegas Waterway (USGS #09419679) and Las Vegas Wash below Flamingo (USGS #094196783). This does not account for the contribution from Duck Creek, which is assumed to be minor. This minimum flow, when compared to the 825 gpm average discharge rate, generates a nominal 87:1 dilution factor. The greatest dilution requirement for any constituent is currently estimated at 19:1. Proposed permit conditions in Section 5 include gathering of additional water quality data and completion of a mixing zone analysis, if required.

5.0 PROPOSED PERMIT CONDITIONS

Timing constraints in meeting the Consent Agreement requirements have limited the ability to gather all necessary information before issuance of a NPDES permit. The following compliance timeline is proposed for submission of additional information.

Condition I

The following work shall be completed by the permittee, as specified:

1. Complete water analysis by a Nevada-certified laboratory, 45 days.
2. Mixing zone analysis for constituents not meeting discharge limitations, 75 days.

Condition II

Limitations on contaminant discharges shall be as follows for the near-term action (ion exchange):

1. Permittee shall remove an average of 97 percent of inlet perchlorate levels for the near-term seep action prior to discharge. This perchlorate removal rate assumes an inlet concentration above 50 ppm and will be calculated as a monthly average of inlet/outlet composite samples. The efficiency of the treatment system at low inlet concentrations (i.e., below 50 ppm) has not been determined at this time. This information will be provided upon completion of additional testing.
2. Permittee shall not discharge a mass load of any constituent listed in form 2D in excess of the mass of that constituent present in the treatment system intake. Depending upon technology used for perchlorate removal, there may be a brief, small increase in specific constituents. These potential increases would be short-term and not constitute an exceedance of a discharge limit.

Condition III

Limitation on contaminant discharges shall be as follows for the long-term remedial action (biodegradation):

1. Upon completion of Condition I, establish long-term discharge limits for perchlorate and TDS, 120 days.
2. Upon completion of Condition I, establish long-term discharge limits for contaminants in the intake water, 150 days.

6.0 PERMIT APPLICATION FORMS

The following NPDES permit application forms are included as Attachment A:

- EPA Form 1
- EPA Form 2D

A

FORM 1	EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION <i>Consolidated Permits Program</i> <small>(Read the "General Instructions" before starting.)</small>	EPA I.D. NUMBER
PLEASE PLACE LABEL IN THIS SPACE			ENV D 0 0 8 2 9 0 3 3 0
GENERAL INSTRUCTIONS			
I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION			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 areas below. Also, if any of 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 all 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		SPECIFIC QUESTIONS	MARK X	
	YES	NO		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 fuels, 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 Kerr-McGee Perchlorate Treatment System

IV. FACILITY CONTACT

2. Crowley, Susan Env Specialist 702 651 2234

V. FACILITY MAILING ADDRESS

3. P.O. Box 55

4. Henderson NV 89009

VI. FACILITY LOCATION

5. 8000 West Lake Mead Drive

Clark

6. Henderson NV 89015

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
7	2	8	1	7			
(specify) Industrial inorganic chemicals, nec				(specify)			
C. THIRD				D. FOURTH			
7				7			
(specify)				(specify)			

VIII. OPERATOR INFORMATION

A. NAME												B. Is the name listed in Item VIII-A also the owner?	
8 Kerr-McGee Chemical LLC												<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box. If "Other" specify)										D. PHONE (area code & no.)			
F = FEDERAL		M = PUBLIC (other than federal or state)		P (specify)		A 702		651		2234			
S = STATE		O = OTHER (specify)											
P = PRIVATE													
E. STREET OR P.O. BOX													
P. O. Box 55													

F. CITY OR TOWN						G. STATE		H. ZIP CODE		IX. INDIAN LAND	
8 Henderson						N V		89009		Is the facility located on Indian lands?	
										<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)						D. PSD (Air Emissions from Proposed Sources)					
9 N NV0000078						9 P n/a					
B. UIC (Underground Injection of Fluids)						E. OTHER (specify)					
9 U NEV94218						9 C OH-0201 (specify) City permit for sanitary wastes to sewer					
C. RCRA (Hazardous Wastes)						E. OTHER (specify)					
9 R n/a						9 03-99-0741-P (specify) Nevada Haz. Material storage permit					

XI. 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.

XII. NATURE OF BUSINESS (provide a brief description)

The Kerr-McGee facility produces ammonium perchlorate. Groundwater near the facility is contaminated with perchlorate, presumed to be the result of historical operations at the site. This NPDES permit application is submitted to address effluent resulting from treatment of this groundwater.

Note: Please refer to the permit application supplemental text for additional details regarding the proposed groundwater treatment systems. The topographic map is provided in Figure 2-1 of the supplemental text.

XIII. 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)			B. SIGNATURE			C. DATE SIGNED		
Frederick R. Stater, Plant Manager						9/17/99		

COMMENTS FOR OFFICIAL USE ONLY

--	--	--	--	--	--	--	--	--	--	--	--

C Use the space below to list any of the pollutants listed in Table 2D.3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
(see attached)	

VI. Engineering Report on Wastewater Treatment

A. If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.
 Report Available No Report

B. Provide the name and location of any existing plants which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location
N/A	

VII. Other Information (Optional)

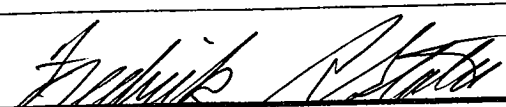
Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

Kerr-McGee proposes to utilize an ion exchange system to treat groundwater in the short term. The ion exchange system will be replaced by a biological treatment system, which will be used for long-term groundwater treatment. Discharges from both systems will occur at the same outfall location in the Las Vegas Wash. Please refer to the permit application supplemental text for additional details regarding the proposed groundwater treatment systems.

The driving force for this treatment system is the removal of perchlorate from the captured seep. Organic contaminants are present in the seep above normal discharge standards, however, are not related to Kerr-McGee activities. This permit is intended to be a "no-net addition" basis for organic contaminants present in the intake water. Pursuant to 40CFR122.459(g), Kerr McGee requests credit for the full level of organic contaminants present in the treatment system intake water.

VIII. Certification

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

A. Name and Official Title (type or print) Frederick R. Stater, Plant Manager	B. Phone No. (702) 651-2200
C. Signature 	D. Date Signed 9/17/99

Constituent	Intake Water mg/l	Discharge Water mg/l	Source
pH	7.85	7.85	Seep intake
ClO ₄ , mg/L (Mont.Watson)	310	9.3	Seep intake, less 97%
TDS, mg/L	7300	12700	Seep intake, plus bio-system
TOC, mg/L	4.6	68.5	Seep intake, plus bio-system
PO ₄ , mg/L	0.56	650	Seep intake, plus bio-system
Total Nitrite/Nitrate N, mg/L	6.98	6.98	Seep intake
Metals, mg/L			
Aluminum	0.22	0.22	Seep intake
Arsenic	0.103	0.103	Seep intake
Barium	0.0214	0.0214	Seep intake
Calcium	552	552	Seep intake
Magnesium	211	211	Seep intake
Manganese	0.946	0.946	Seep intake
Nickel	0.0152	0.0152	Seep intake
Potassium	45.8	45.8	Seep intake
Selenium	0.011	0.011	Seep intake
Sodium	1520	1520	Seep intake
Strontium	11.2	11.2	Seep intake
Vanadium	0.051	0.051	Seep intake
SVOCs			
Pentachlorophenol	0.017	0.017	Seep intake
Trichlorobenzene 1,2,4	0.001	0.001	Seep intake
Herbicides, mg/L			
2,4,5-TP	0.0362	0.0362	Seep intake
2,4,5-T	0.257	0.257	Seep intake
Dalapon	0.79	0.79	Seep intake
Dinoseb	0.39	0.39	Seep intake
Dicamba	0.099	0.099	Seep intake
MCPA	28000	28000	Seep intake
TCL Pesticides, mg/L			
Alpha BHC	0.664	0.664	Seep intake
Beta BHC	0.249	0.249	Seep intake
Delta, BHC	1.68	1.68	Seep intake



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

August 24, 1999

Mr. Douglas Zimmerman, Bureau Chief
Bureau of Corrective Actions
Department of Conservation and Natural Resources
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710



Dear Mr. Zimmerman:

RE: Decision Summary – August 19, 1999 Meeting

Representatives of Kerr-McGee Chemical LLC (Kerr-McGee), Nevada Department of Environmental Protection (NDEP), and ENSR met on August 19, 1999, to discuss and agree upon several items regarding the perchlorate seep removal action and long-term perchlorate removal action in Henderson, Nevada. The meeting also resulted in assignments to ensure the activities are completed in a timely manner. Attendees at the meeting included Susan Crowley and Everette Spore, Kerr-McGee; Douglas Zimmerman and Brenda Pohlmann, NDEP; and Rick Simon and Mark Warner of ENSR. This letter documents the results of the August 19, 1999 meeting.

The *Work Plan for the Perchlorate Seep Removal Action Henderson, Nevada*, dated August 12, 1999, was reviewed at the meeting. Verbal comments were provided by the NDEP. Based on these comments, Kerr-McGee agreed to submit errata to the Work Plan. The errata are included as Attachment 1 to this letter. NDEP stated that upon receipt of the requested errata, they would consider the Work Plan approved as required by the July 28, 1999 Consent Agreement. NDEP's approval of the Work Plan, inclusive of the attached errata pages, will be indicated by NDEP's signature at the close of this document.

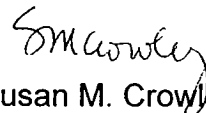
At the meeting, NDEP discussed their need for regular progress reports. Kerr-McGee agreed that each calendar month a brief report will be submitted to NDEP describing accomplishments toward the implementation of the seep removal action. The report will describe the status of the engineering, design and procurement activities, as well as the major permits and approvals required for construction and operation of the system. If necessary, the report will also advise the NDEP of issues that have the potential to impact the project schedule.

As additional completion dates for key milestones are determined, they will be documented in the monthly reports. Project documentation, such as the Health and Safety Plan and the Technical Compliance Monitoring Plan that are developed for the seep removal action, will be submitted as attachments to the monthly report.

In addition to the monthly reports, NDEP and Kerr-McGee agreed to participate in meetings to discuss the seep removal action. The meetings will be held on an as-needed basis, with an expectation that they will be bi-weekly. The meetings may include other federal, state, and local agencies involved in expediting the permitting process, as needed.

Once again, Kerr-McGee appreciates your assistance with this action. If you need additional information, please contact me at (702) 651-2234.

Sincerely,



Susan M. Crowley
Staff Environmental Specialist

NDEP Approved: _____
NDEP Representative

Date: _____

cc: Brenda Pohlmann, NDEP
LKBailey
PSCorbett
WOGreen
EMSpore
FRStater
JTSmith
R Simon, ENSR

ATTACHMENT 1

Work Plan
Errata Pages

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2.0 PROJECT SCOPE AND WORK DESCRIPTION.....	2-1
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APPENDIX

- A** CONSENT AGREEMENT
- B** HEALTH AND SAFETY PLAN
- C** TECHNICAL COMPLIANCE MONITORING PLAN
- D** INSPECTION, MAINTENANCE AND SPILL PREVENTION AND CONTINGENCY PLAN

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2-1 Location Map.....	2-2
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3-1 Project Task Schedule	3-2

**TABLE 2-1.
Perchlorate Seep Remediation Workplan – Permitting Requirements**

Permit Jurisdiction	Permitting/Approval Agency	Activity
Federal	Bureau of Reclamation (BOR)	Site Access and Land Use on Federal Lands
		National Environmental Policy Act (NEPA) Compliance Issues
	Corps of Engineers (COE)	Work in Wetlands
	Fish and Wildlife Service (USFWS)	Protection/Avoidance of Endangered Species
State	Nevada State Engineer	Water Diversion Permit
	Nevada Department of Environmental Protection (NDEP)	Treated Water Discharge Permit
Local	Clark County, Nevada Site is in City of Henderson Jurisdiction, may need to copy County on Use Permit	Building Permits
		Land Use Permit
	City of Henderson Public Works Department	Building Permits
		Grading Permit
	City of Henderson Planning Department	Conditional / Temporary Use Permits
Private	Nevada Power	Electrical Connection
	Sprint Telephone	Telephone Connection
	Private Land Owners	Easements, Encroachment

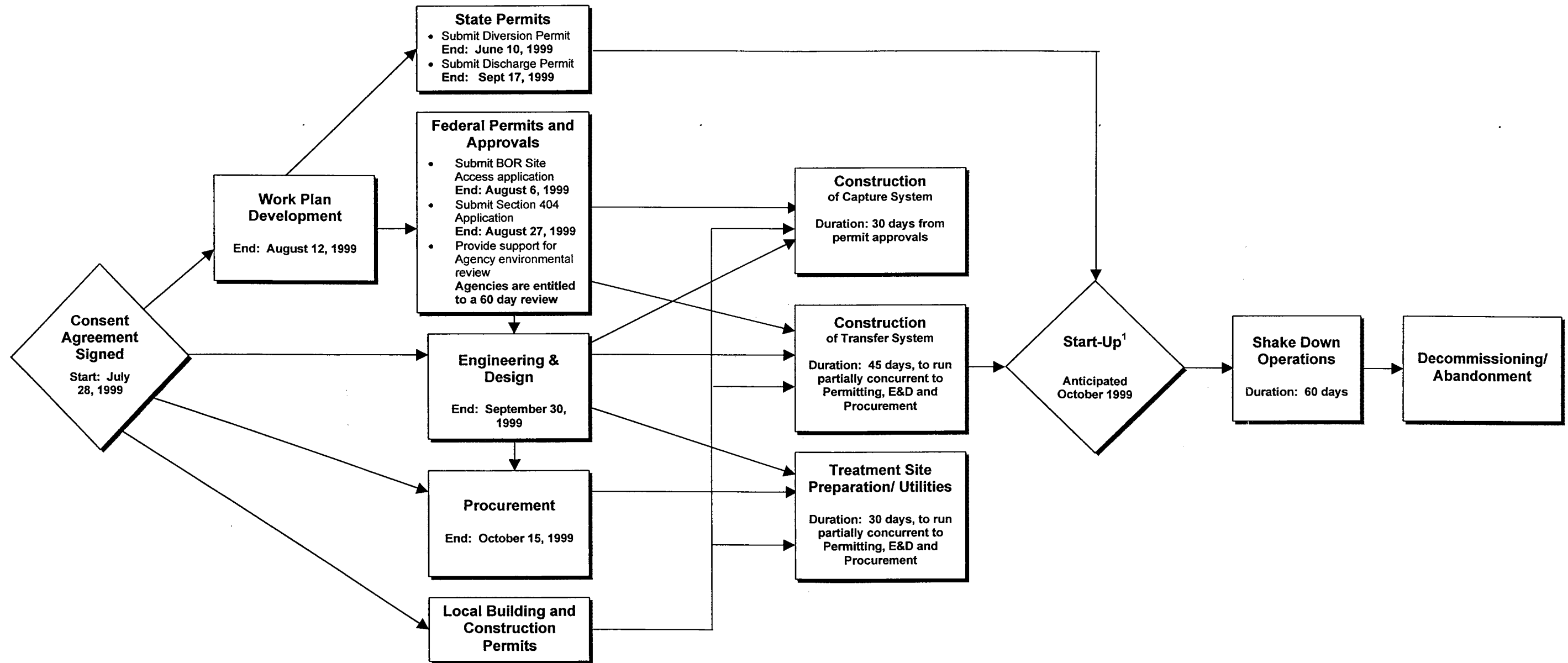
3.0 PROJECT TASK SCHEDULE

The project has been developed to comply with the Consent Agreement and project permitting requirements. Figure 3-1 provides the Project Task Schedule.

The schedule assumes that permitting, right-of-way access agreements, and pre-construction activities will be completed prior to construction. After construction, a startup period will be required to ensure the system operates as designed. The short-term seep interception and treatment system is expected to operate for approximately one year, or until a long-term remedial system is installed. Once the long-term removal system is operating, the treatment equipment and structures associated with this action will be removed. The collection and pumping systems will remain for use in the longer-term removal effort.

As discussed in Section 2.4 of this Plan, various agency permits and approvals are necessary for this removal action. Schedule impacts and associated issues will be reported to the NDEP.

Figure 3-1
Project Task Schedule
Kerr-McGee Chemical LLC
Perchlorate Seep Removal Action Workplan



¹Consistent with Consent Agreement, Section II.2.

Page 1-1: The "most notable" key assumption should be that Kerr McGee submits a timely and technically complete application based on the requirements of Nevada law and regulation.

Page 1-3: What are "potentially conflicting conditions of approvals"? Approvals/permits will be issued consistent with Nevada law and regulations.

Page 2-1: How accurate is the "estimated" discharge volume of 360 g.p.m.?

Page 2-3: Pre-construction activities, as described on page 2-3, are acceptable to NDEP but may require other agency approvals.

Page 2-4: Will a modification of the existing 11 acre pond permit be required to allow discharge to the pond from the ion exchange trailer?

Page 2-6: A "water diversion permit" is not issued by NDEP. NDWR should be contacted for this matter.

Page 2-7: "Kerr McGee will provide routine status reports". An agreed to schedule should be established, status reports every two weeks? *Monthly reports - get together every two weeks.*

Page 2-7: What is "achievement of the short-term project objectives" that would allow decommissioning?

Appendix C-1: Sampling locations along the Wash should be included in the monitoring program. Dewatering activities for grade control structures should be evaluated with respect to a monitoring program.

*Brenda,
My comments on KM Workplan.
The schedule, "Task Sequence" needs work.
DZ*

Post-it® Fax Note 7671		Date 8/17/99	# of pages 1
To Brenda P	From Doug Z	Co.	
Co./Dept	Phone #	Phone #	
Fax # 486-2863	Fax #		

PETER G. MORROS, Director

ALLEN BIAGGI, Administrator

(775) 687-4670

TDD 687-4678

Administration
Water Pollution Control
Facsimile 687-5856

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor



Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

August 19, 1999

Kerr-McGee Chemical Corporation
Attn: Susan M. Crowley
P. O. Box 55
Henderson, NV 89009

RE: No Further Action Determination (12.692 Acre and 4.99 Acre Parcels)

Dear Ms. Crowley:

The Nevada Division of Environmental Protection (NDEP) has completed its review of Kerr-McGee Chemical Corporation's (Crowley) requests, dated December 17, 1999 and May 14, 1998, for no further action determinations for a 12.692 acre portion of Section 13 and a 4.99 acre portion of Section 12 within the BMI Industrial Complex in Clark County, Nevada. The Parcels are more fully described in the attached legal descriptions and letters of request, which are incorporated by this reference.

Our review has included available information regarding environmental conditions on the Property including the Phase I Environmental Conditions Assessment (ECA) Report for the Kerr-McGee Chemical Corporation facility in Clark County, Nevada (Kleinfelder, April 15, 1993.) Based on our review of this information, we have concluded that no further actions are required or necessary with respect to the Parcels to protect human health or the environment. NDEP hereby excludes the Parcels from any further environmental assessment or other response action, and agrees that development may proceed on the Parcels without environmental restriction based on known present conditions. The NDEP fully releases and discharges the Parcels from any and all terms, requirements and obligations of those certain Consent Agreements which were entered into by the NDEP respecting the BMI Industrial Complex, dated April 25, 1991 (note 1 below), and February 23, 1996 (note 2 below) and with Kerr-McGee Chemical Corporation, dated September 5, 1996.

In consideration of the fulfillment of NDEP's environmental assessment and no further action requirements, the State of Nevada, Department of Conservation and Natural Resources, Division

Kerr-McGee Chemical Corporation

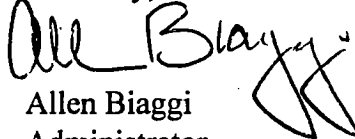
August 19, 1999

Page 2

of Environmental Protection ("Division") hereby releases, discharges and covenants not to seek to hold any purchaser, tenant, lender or other third party which acquires an interest in the Parcels, or any of their officers, directors, partners, employees, agents, successors, affiliates or assigns, (collectively "Parties") liable as owners, operators or in any other manner, in law or in equity, under any statute, regulation or any federal, state or common law, for contamination known to exist at, on, in or below the Parcels and described in the ECA Report, legal description and letter of request. The Division reserves, and the foregoing sentence is without prejudice to, all of its authorities with respect to the discovery of contaminated conditions at, on, in or below the Parcels that are not described in the ECA Report, and the receipt by the Division of information, previously unknown to the Division, in the event that either such condition or information indicate an actual or potential threat to human health or the environment. The Division acknowledges that Kerr-McGee Chemical Corporation and other Parties may rely on the covenants in this paragraph in connection with the purchase, sale and development of the Parcels, and consents to such reliance. The Division consents to the recordation of these covenants or a recordable notation of them in the Clark County Recorder's Office.

The undersigned certifies that he is authorized by the Director, Department of Conservation and Natural Resources to sign this letter.

Sincerely,



Allen Biaggi
Administrator

AB:lfs

cc: Dan H. Stewart, Basic Management, Inc., P.O. Box 2065, Henderson, NV 89015
Barry Conaty, Cutler & Stanfield, 700 14th St., NW, Washington, DC 20005
Philip Speight, City Manager, 240 Water St., Henderson, NV 89015

Notes:

1. The other parties are Chemstar, Inc., Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, Inc., and Titanium Metals Corporation.

2. The other parties are Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, and Titanium Metals Corporation.

Tom 22

STATE OF NEVADA
KENNY C. GUINN
Governor

PETER C. MORROS, Director
ALLEN BIAGGI, *Administrator*

(775) 687-4670
TDD 687-4678

Administration
Water Pollution Control
Facsimile 687-5856

Mining Regulation and Reclamation
Facsimile 684-5259



Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

August 19, 1999

Mr. Kent R. Stephenson
Vice President and General Counsel
Pioneer Companies, Inc.
700 Louisiana Street, Suite 4300
Houston, Texas 77002

RE: No Further Action Determination (Parcels PCA 37A, 37B and 38)

Dear Mr. Stephenson:

The Nevada Division of Environmental Protection (NDEP) has completed its review of Pioneer's (Sylvia) request, dated July 22, 1999, for a no further action determination for PCA 37A, PCA 37B and PCA 38, Pioneer Chlor Alkali Co., Inc. within the BMI Industrial Complex in Henderson and Clark County, Nevada. Each Parcel is more fully described in the attached legal descriptions and letter of request, which are incorporated by this reference.

Our review has included available information regarding environmental conditions on the Parcels including the Phase I Environmental Conditions Assessment (ECA) Report for the Pioneer Chlor Alkali Company, Inc., and Stauffer Chemical Company, Clark County, Nevada (Weston, March 22, 1993).

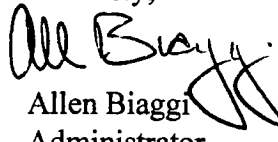
Based on our review of this information, we have concluded that no further actions are required or necessary with respect to the Parcels to protect human health or the environment. NDEP hereby excludes the Parcels from any further environmental assessment or other response action, and agrees that development may proceed on the Parcels without environmental restriction based on known present conditions. The NDEP fully releases and discharges the Parcels from any and all terms, requirements and obligations of those certain Consent Agreements which were entered into by the NDEP respecting the BMI Industrial Complex, dated April 25, 1991 (note 1 below), and February 23, 1996 (note 2 below) and with Stauffer Management Company and Pioneer Chlor Alkali company, Inc., dated June 28, 1996.

In consideration of the fulfillment of NDEP's environmental assessment and no further action

Mr. Kent R. Stephenson
August 19, 1999
Page 2

requirements, the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("Division") hereby releases, discharges and covenants not to seek to hold any purchaser, tenant, lender or other third party which acquires an interest in the Parcels, or any of their officers, directors, partners, employees, agents, successors, affiliates or assigns, (collectively "Parties") liable as owners, operators or in any other manner, in law or in equity, under any statute, regulation or any federal, state or common law, for contamination known to exist at, on, in or below the Parcels and described in the ECA Report, legal description and letter of request. The Division reserves, and the foregoing sentence is without prejudice to, all of its authorities with respect to the discovery of contaminated conditions at, on, in or below the Parcels that are not described in the ECA Report, and the receipt by the Division of information, previously unknown to the Division, in the event that either such condition or information indicate an actual or potential threat to human health or the environment. The Division acknowledges that Pioneer and other Parties may rely on the covenants in this paragraph in connection with the purchase, sale and development of the Parcels, and consents to such reliance. The Division consents to the recordation of these covenants or a recordable notation of them in the Clark County Recorder's Office.

The undersigned certifies that he is authorized by the Director, Department of Conservation and Natural Resources to sign this letter.

Sincerely, -

Allen Biaggi
Administrator

AB:lfs

cc: Dan H. Stewart, Basic Management, Inc., P.O. Box 2065, Henderson, NV 89015
Barry Conaty, Cutler & Stanfield, 700 14th St., NW, Washington, DC 20005
Philip Speight, City Manager, 240 Water St., Henderson, NV 89015

Notes:

1. The other parties are Chemstar, Inc., Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, Inc., and Titanium Metals Corporation.

2. The other parties are Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, and Titanium Metals Corporation.

Aug. 18, 1999

KMCC - Discharge Permit

Cl⁻ exchange process will be an interim measure for NO₃⁻ removal. Plan on having biological system up in ~ 12 months. Looking for discharge permit - Cattrie said it cannot extend temporary discharge beyond 180 days. Mixing zone permit can be granted if confidence exceeds chronic aquatic life standard but not if acute is exceeded.

TMDLs for ammonia and phosphorus - need data for final permit.

Also need to deal w/ TDS. ~~Be~~ Conduct an economic analysis.

Cattrie can issue temp permit w/ a schedule of compliance for submitting necessary info w/in 6 months for final.

Phosphorus TMDL has been allocated so need a way to reallocate it.

Pat / James Green 1:30 Boulder City



KERR-McGEE CHEMICAL LLC
 POST OFFICE BOX 66 · HENDERSON, NEVADA 89009

RECEIVED

AUG 10 1999 *2*

August 11, 1999

**OFFICE OF ATTORNEY GENERAL
 DEPUTY ATTORNEY GENERAL**

Doug Zimmerman
 Department of Conservation
 and Natural Resources
 Division of Environment Protection
 333 West Nye Lane
 Carson City, Nevada 89706-0851

SEP - 1 99
 DEPARTMENT OF
 CONSERVATION
 AND NATURAL RESOURCES

Dear Doug:

Attached is Kerr-McGee's proposed Workplan and schedule for removal of perchlorate from the seep identified adjacent to the Las Vegas Wash, as required by the Consent Agreement executed by NDEP on July 28, 1999.

Pending approval of this Workplan, Kerr-McGee is taking all appropriate steps to acquire the necessary equipment and to "scope out" the necessary permits and approvals. The attached schedule will allow initiation of treatment of seep waters by October 1999, provided the requisite authorizations can be obtained promptly. We appreciate the continued support and assistance of NDEP in resolving these authorization issues.

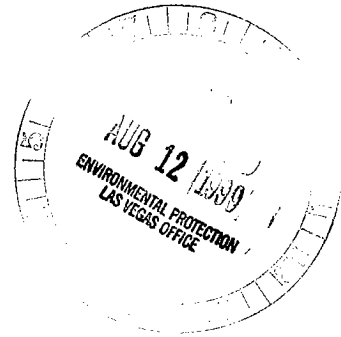
Please note that the attached Workplan contains a location description for the seep that varies slightly from that contained in the July 28 Consent Agreement. It is now our understanding that the seep is in the SW quarter and not the SE quarter of the SW quarter of Section 30.

Sincerely,

Patrick S. Corbett

cc: William Frey
 Brenda Pohlmann

August 11, 1999



Dear Recipient:

Today, via Federal Express, you will have received a copy of the Work Plan for the Perchlorate Seep Removal Action Henderson, Nevada. This Work Plan was prepared by ENSR Corporation for Kerr-McGee Chemical LLC. The enclosed transmittal letter was inadvertently omitted from your package. Please include the enclosed letter along with the associated Work Plan.

Thank you for your cooperation.

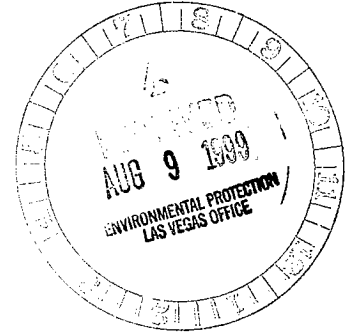


KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

August 5, 1999

Henri Kaplan
Bureau of Reclamation
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, Nevada 89006-1470



Dear Mr. Kaplan:

Subject: Right of Use Application

Kerr-McGee Chemical LLC (KMCLLC) has committed, by way of a Consent Agreement with the State of Nevada, to capture and treat groundwater which has surfaced and formed a stream discharging to the Las Vegas Wash. The Consent Agreement requires "near-term" treatment to begin by the end of October 1999. The seep where the groundwater surfaces, as well as the resulting stream, is located on Bureau of Reclamation property. The sole purpose of this project is to improve water quality in the area.

Attached please find a Right-of-Use application to access the property needed to accomplish this remedial action. To support this application, Kerr McGee will submit pertinent environmental documentation that discusses the project and project area. This information is based upon the environmental analysis contained in the recently completed EIS for the Clark County Wetlands Park supplemented with specific studies undertaken as part of our planning of this project. We encourage the Bureau of Reclamation to make use of this environmental information while evaluating our current application.

Additionally, the attached supporting information includes a copy of the Consent Agreement. The Consent Agreement binds KMCLLC to work diligently to accomplish their commitment to capture and treat the surfaced groundwater. To meet this requirement, KMCLLC has prepared an aggressive permitting and construction schedule with project completion expected in October 1999. KMCLLC is also contacting other federal, state, and local agencies to begin the permitting and approval processes. Due to the limited time available to complete all aspects of the project, KMCLLC requests that the Bureau of Reclamation allow access for site preparation while this application is being considered.

Please feel free to call me at (702) 651-2234 if you have any questions or need additional information. Thanks you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Attachment

By Certified Mail

cc: LKBailey
PSCorbett
EMSpore
FRStater
Rick Simon, ENSR
Bruce Wilcox, PBJ & J
Doug Zimmerman, NDEP
Brenda Pohlmann, NDEP

SUGGESTED FORMAT TO APPLY FOR RIGHT-OF-USE

A. Complete in detail the information requested below. If you have questions, please contact the Bureau of Reclamation.

B. Fees and Associated Costs. An initial deposit fee of \$200, payable to the Bureau of Reclamation, must accompany the initial application. If, after a preliminary review of the application Reclamation determines the granting of a Right-of-Use is incompatible with present or future uses of the land and the Right-of-Use cannot be granted, \$150 of the \$200 deposit will be returned. The remaining \$50 will be retained by Reclamation regardless of its disposition of the Right-of-Use request.

Applicants will be required to pay any administrative costs which are in excess of the \$200 deposit for the preparation of the Right-of-Use as well as the fair market value of the right granted. Administrative costs include, but are not limited to, appraisal costs, National Environmental Policy Act (NEPA) compliance, and costs related to Reclamation's review, processing and issuance of the right-of-use. Any administrative costs less than \$150 will result in an appropriate refund to the applicant or may be applied to the value of the Right-of-Use at the discretion of the applicant. This shall apply equally to requested Rights-of-Use which are offered by Reclamation and are requested by the applicant, as to those which the applicant accepts.

No refund will be made for any deposits if the applicant refuses to accept the Right-of-Use after it is prepared and offered.

C. Submit fee and application to: Bureau of Reclamation
Lower Colorado Regional Office
Attention: LC-2000
P.O. Box 61470
Boulder City, Nevada 89006-1470

INFORMATION:

(Fill out completely. If a particular item does not apply to the proposed use, please so state by marking that item as "Not applicable" or "N/A".)

1. Right-of-Use is to be issued to:

Individual(s) Company General Partnership Limited Partnership
Corporation X Other Kerr-McGee Chemical Limited Liability Company
(Specify)

1. If applicable, the State under whose laws the entity or company was established: Delaware

2. Legal name, address, and telephone number of individual(s) or entity to whom the Right-of-Use is to be issued.

Kerr-McGee Chemical LLC, PO Box 55, Henderson, NV 89009
(702) 651-2200

2a. Full legal name and title of individual(s) who will sign the Right-of-Use document.

Fredrick R. Stater, Plant Manager

3. Name, address, and telephone number of individual to contact for additional information, if other than No. 2 above.

Susan M. Crowley, (same address and phone)

4. General location of proposed Right-of-Use: State Nevada County Clark
Section 30 Parts SW 1/4 Township 21 Range 63 Meridian MDM

4a. Acreage of proposed Right-of-Use: Approx. 7.2 acres

5. Provide a detailed description of the proposed use of Reclamation's lands and/or facilities. (Use additional sheet(s) of paper if necessary.)
Please see Attachment 1.

6. Provide a map or drawing showing the approximate location of the requested Right-of-Use. The map or drawing should relate to Reclamation's land boundaries and include reference to the appropriate Section, Township, Range, and Meridian.
Please see Attachment 2.

7. Provide a legal description of either aliquot parts or metes and bounds to describe the route or area of use desired on Reclamation's lands.
Please see Attachment 2.

8. If the Right-of-Use request involves construction activities, provide a complete set of construction specifications, engineering drawings, power flow diagrams, one-line diagrams, and any other plans and specifications of the proposed use which clearly identify the impacts of the proposed use on Reclamation's lands and/or facilities. Include physical data and dimensions, such as pipe sizes, width and length of right-of-use, line voltages, stationing, etc., and reference to Reclamation's land boundaries and the appropriate Section, Township, Range, and Meridian.

9. Period of use desired: From 8/1/99 to 12/31/2020 (Reclamation will establish actual period of use.)

10. Construction schedule (if applicable):
8/15/99 Anticipated commencement date
10/31/99 Anticipated completion date

I certify that the information given in this application is true, complete, and correct to the best of my knowledge and belief, and is given in good faith. I also understand that I am responsible for all administrative costs which are in excess of the \$200 deposit for the preparation of the right-of-use issued as well as the value of the right-of-use granted. I further understand that I cannot occupy Reclamation lands or initiate work on Reclamation lands until I receive a Right-of-Use document signed by the United States.

August 5, 1999
Date

[Signature]
Signature of Applicant

FOR RECLAMATION USE ONLY

Land Status: Acquired Withdrawn Right-of-Way/Easement
Reclamation Project: _____ Division _____
Facility _____
Water User Entity _____
Contract No. Assigned _____

ATTACHMENT 1

Description of Proposed Use
of
Bureau of Reclamation Lands

Description of Proposed Use of Bureau of Reclamation Lands

August 5, 1999

Kerr-McGee Chemical LLC is bound, by condition of the attached Consent Agreement, to capture and treat groundwater which has surfaced and formed a stream discharging to the Las Vegas Wash. The seep where the groundwater surfaces, as well as the resulting stream, is located on Bureau of Reclamation property. The legal description of the project area is attached.

Kerr-McGee proposes to capture the surfaced groundwater by utilizing a concrete weir / sump, approximately 30' wide by 8' long, placed in the path of the stream. The sump will be located at approximately SPC - N 26,733,690.957 / E 831,433.301, within the legal description referenced above. Please see Figure 1a, b and c for a progressively closer aerial view of the site. The water will be pumped from the sump and transported, via pipeline, south to adjacent private property to a treatment facility. At the treatment facility, KMCLLC will treat the water to remove the perchlorate. The treated water will be transported back to the original capture point and discharged immediately downgradient from the capture sump. The discharge location will be designed to prevent erosion, and as nearly as possible, allow the stream to take its natural path ultimately discharging in the Las Vegas Wash.

Figure 1 a



Figure 1 b

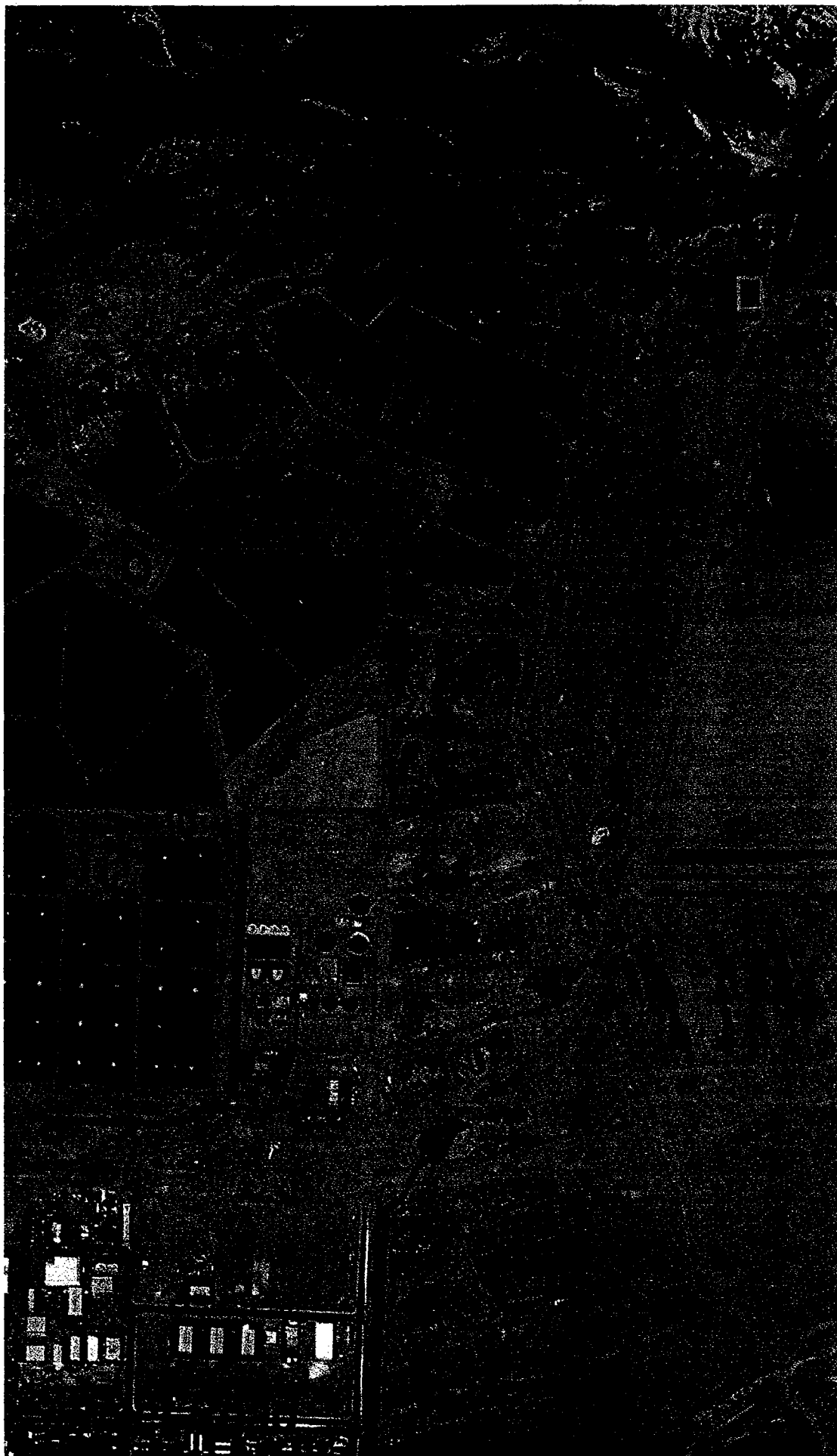
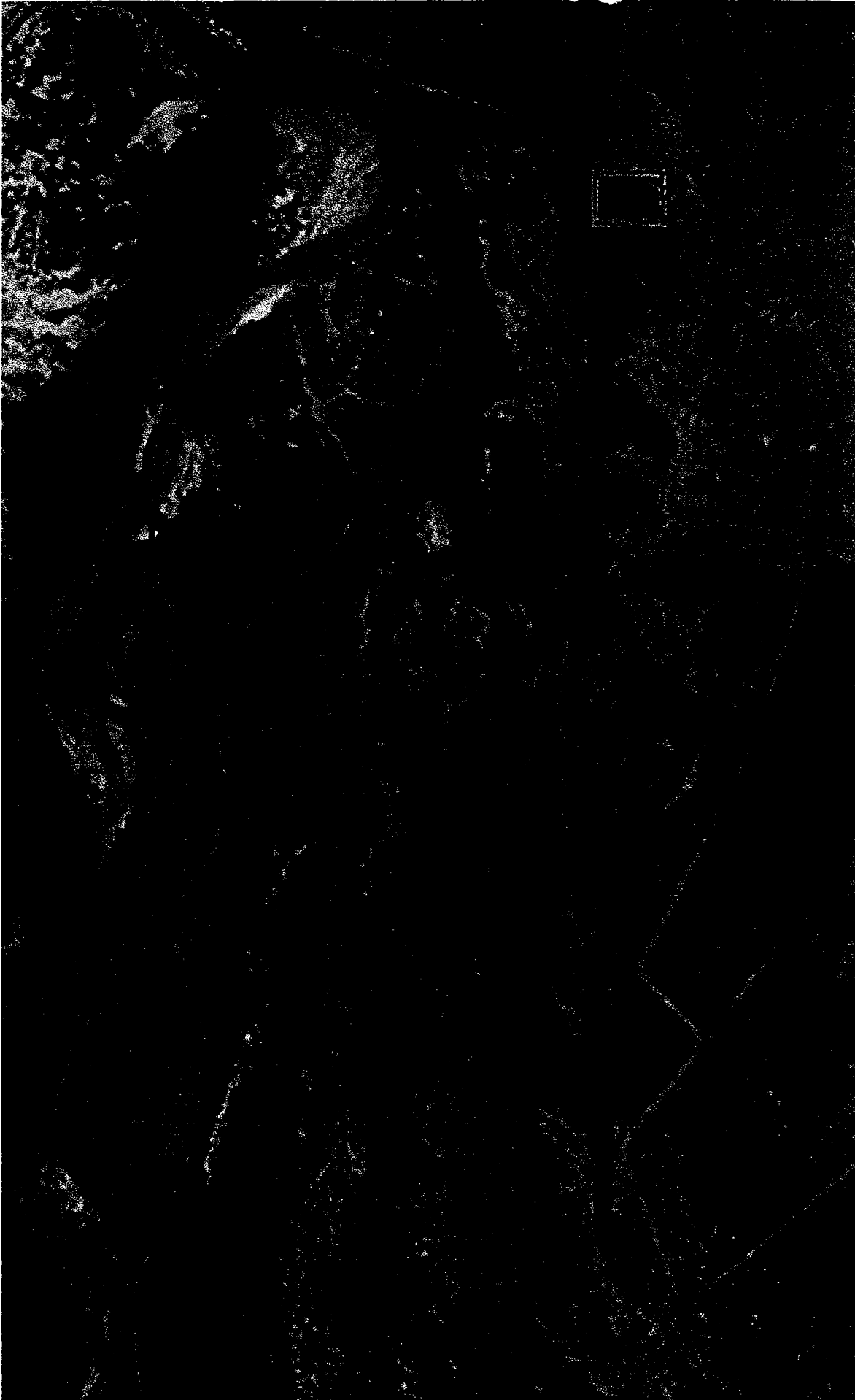


Figure 1 c



CONSENT AGREEMENT

This Consent Agreement is made and entered into this 26 day of July, 1999, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("NDEP" or "Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). Kerr-McGee and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Division is designated as the state water pollution control agency for Nevada and is empowered to administer and enforce the Nevada Water Pollution Control Law, Nevada Revised Statutes ("NRS") §§ 445.131 to 445.354, inclusive;

WHEREAS, Kerr-McGee has since 1967 owned and operated a plant at Henderson, Nevada used to produce ammonium perchlorate, which same facility Kerr-McGee asserts was previously owned by the United States Navy and others for the manufacture of perchlorate products and intermediates;

WHEREAS, in Henderson, to the southwest of Kerr-McGee's facility, ammonium perchlorate was manufactured by Pacific Engineering and Production Co. of Nevada ("PEPCON");

WHEREAS, sampling of groundwater at Kerr-McGee's and PEPCON's sites and in areas to the north and east of these facilities, approaching the Las Vegas Wash has indicated elevated levels of perchlorate in groundwater which are presumptively associated with historical operations at Kerr-McGee's and PEPCON's facilities;

WHEREAS, the Division has recently identified a groundwater seep north of the BMI lower ponds and adjacent to the Las Vegas Wash, believed to be located within the SE/4 of the

SE/4 of the SW/4, Sec. 30, T21S, R63, Clark County, Nevada, and the Division believes that expeditious action to capture this seep should materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

WHEREAS, Kerr-McGee has been cooperating with the Division in the further delineation of groundwater plumes of perchlorate and in the investigation of appropriate and feasible means to remediate this contamination, and Kerr-McGee has already constructed an eleven acre, lined impoundment at its Henderson facility and through use of this impoundment is currently removing substantial quantities of perchlorate from groundwater each day;

WHEREAS, Kerr-McGee desires to continue to cooperate fully with the Division in addressing the potential problem of perchlorate contamination in the Henderson, Nevada area, while preserving its rights to seek contribution from third parties who are likely to share responsibility for perchlorate contamination, including the United States Navy and PEPCON;

NOW, THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, and intending to be legally bound hereby, the Division and Kerr-McGee agree as follows:

I. STATEMENT OF PURPOSE

The Division and Kerr-McGee are entering into this agreement for three interrelated purposes:

1. To assure prompt implementation of a removal action to capture and contain perchlorate contaminated groundwater (the "seep") surfacing north of the BMI lower ponds and adjacent to the Las Vegas Wash and thereby to materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

2. To establish a framework for continued development by Kerr-McGee, in cooperation with the Division, of a plan to address more broadly perchlorate contamination in groundwater at Henderson, Nevada, including activities to address perchlorate at the Pittman Lateral area, and thereby achieve substantial, long-term remediation of perchlorate contamination at Henderson.

3. To provide for reimbursement to the Division of Kerr-McGee's fair share of oversight costs that the Division has incurred, and may in the future incur, with respect to the investigation and remediation of this perchlorate contamination in groundwater.

II. WORK TO BE PERFORMED

1. The parties intend that the work to be performed in accordance with this Agreement shall be carried out in manner consistent with applicable federal and Nevada statutes, implementing regulations, and with the National Contingency Plan, 40 C.F.R. § 300.1 *et seq.*

2. Within 15 days of execution of this Agreement, Kerr-McGee shall submit a Workplan detailing the removal measures that it plans to implement to capture and control the groundwater seep identified in the Las Vegas Wash area. The plan shall be consistent with the following key elements:

(a). Kerr-McGee anticipates that completion of testing, site construction and equipment deliveries will allow the initiation of recovery of perchlorate at the seep in October 1999.

(b). Treatment of perchlorate is expected to involve removing at least 97 percent of the perchlorate by ion exchange prior to discharge of the water.

(c). The parties recognize that permitting for seep access, construction and treated water discharge will require a concerted effort between Kerr-McGee and the agencies involved to meet the October 1999 deadline.

(d). Although Kerr-McGee believes that initial ion exchange technical results are promising, if technical obstacles arise, Kerr-McGee may submit a modified treatment plan to the Division.

The plan shall contain a schedule for implementation of the necessary control measures. Upon approval of this Workplan, it shall become an enforceable obligation pursuant to this decree. The parties will endeavor to reach mutual agreement on any changes to the Workplan after its submission, but, failing such agreement, the Division's written determination of necessary changes shall control, subject to Kerr-McGee's right to seek dispute resolution under Section IV below. The parties acknowledge that any such Workplan and schedule must take into account the necessity of a permit or other approval for discharge of water from the seep after removal of perchlorate.

3. No later than 60 days from the date of execution of this Agreement, Kerr-McGee shall submit a second Workplan and schedule setting forth a proposed long-term remedy to perchlorate contamination in the groundwater at Henderson. The Workplan must identify a system for long-term capture and treatment of perchlorate contamination in groundwater and for discharge of effluent from this perchlorate removal system. Such plan, at a minimum, shall include activities addressed to recover perchlorate contamination at the Pittman Lateral area, which activities will begin no later than December 31, 1999.

4. The parties agree that, upon submission of this second Workplan addressing long-term remedial issues, they will promptly enter good faith discussions of a consent agreement to

govern implementation and operation of this long-term remedy. The parties further agree to cooperate in resolving any issues that may remain regarding discharge of groundwater after treatment for perchlorate, including cooperation on issues relating to necessary permits.

III. STIPULATED PENALTIES

Unless there has been a written modification approved by NDEP or a Force Majeure under Section V, any failure by Kerr-McGee to meet a schedule deadline or an approved Workplan condition may result in NDEP assessing stipulated penalties against Kerr-McGee. The following table reflects the maximum penalties that may be imposed. Nothing in this Agreement shall be construed to limit in any manner NDEP's discretion with respect to whether to take enforcement action or to assess less than the maximum penalty. Failure to commence or complete work as described in the approved Workplan at the scheduled time may result in the following penalties subject, however, to a cap of \$250,000:

<u>Period of Noncompliance</u>	<u>Maximum Penalty per Day</u>
1 st – 7 th day	\$ 1,000
8 th – 21 st day	\$ 2,500
22 nd day and thereafter	\$ 5,000

The assessment of stipulated penalties shall not alter Kerr-McGee's obligation to comply with the terms of this Agreement.

IV. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this Consent

Agreement. If Kerr-McGee fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If Kerr-McGee disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, Kerr-McGee shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute which arises under or with respect to this Consent Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed ten (10) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within ten (10) days after the conclusion of the informal negotiation period, Kerr-McGee invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position Kerr-McGee claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for Kerr-McGee's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by Kerr-McGee, and any matters which it considers necessary for the Administrator's determination. The Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to

answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for an oral presentation.

5. Within fifteen (15) days following receipt of a Statement of Position, or after any oral presentation by Kerr-McGee, the Administrator shall issue his/her decision. The Administrator's written decision shall include a response to Kerr-McGee's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this Consent Agreement, and shall be considered the Department's final decision and an exhaustion of Kerr-McGee's administrative remedies.

6. As to any final decision of the Administrator, Kerr-McGee may seek judicial review as provided by State law and regulations.

V. FORCE MAJEURE

1. Kerr-McGee shall perform the requirements of this Consent Agreement within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. Kerr-McGee shall have the burden of proving such a *force majeure*. A *force majeure*, for purposes of this Consent Agreement, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of Kerr-McGee, or of any person or entity controlled by Kerr-McGee, which delays or prevents the timely performance of any obligation under this Consent Agreement despite Kerr-McGee's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes and lockouts, by other than Kerr-McGee employees, national emergencies, delays in obtaining access or use of property not owned or controlled by Kerr-McGee despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from

the Division or any other public agency that occur despite Kerr-McGee's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the Consent Agreement. A *force majeure* does not include (i) increased costs of the work to be performed under the Consent Agreement, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of Kerr-McGee's obligations under this Consent Agreement; whether or not caused by a *force majeure* event, Kerr-McGee shall notify the Division orally within two (2) business days of when Kerr-McGee first knew that the event might cause a delay. If Kerr-McGee wishes to claim a *force majeure* event, then within five (5) business days thereafter, Kerr-McGee shall provide to the Division a written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Kerr-McGee's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of Kerr-McGee, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. Kerr-McGee shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Kerr-McGee from asserting any claim of *force majeure* for that event.

3. The Division shall notify Kerr-McGee in writing of its *force majeure* determination within ten (10) days after receipt of the written notice from Kerr-McGee. If the Division determines that the delay has been or will be caused by circumstances constituting a

force majeure event, the time for performance of the obligations under this Consent Agreement that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless Kerr-McGee can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and Kerr-McGee cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, of if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section IV of this Consent Agreement.

VI. REIMBURSEMENT OF OVERSIGHT COSTS

1. Kerr-McGee shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement, following the effective date and for the effective period of this Consent Agreement. Kerr-McGee also agrees upon the effectiveness of this Agreement promptly to reimburse the Division for its share of the past oversight costs related to perchlorate as of the 30th day of June 1, 1999, in the amount of \$52,824.91.

2. The Division shall account for oversight costs associated with implementing this Consent Agreement and related work and shall submit to Kerr-McGee copies of all invoices on a quarterly basis, commencing with the first calendar quarter after the effective date of this Consent Agreement. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or cost details for administrative and vendor expenses (such as travel, training,

equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by Kerr-McGee of the invoices. Kerr-McGee may dispute particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of any such dispute, Kerr-McGee shall pay in a timely fashion undisputed costs. With respect to the disputed cost, Kerr-McGee may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section IV.

3. All payments due by Kerr-McGee shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and Kerr-McGee's name and address.

VII. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Kerr-McGee's failure to comply with any of the requirements of this Consent Agreement or of any requirement of federal or state laws, regulations, or permit conditions. Except as provided in Section VIII (Other Claims; Covenant Not to Sue), this Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State.

This Consent Agreement in no way relieves Kerr-McGee of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by Kerr-McGee pursuant to this Consent Agreement subject to Dispute Resolution under Section IV.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this Agreement, or (2) any applicable provision of state or federal law, subject to the Covenant Not To Sue under Section VIII.

4. Kerr-McGee reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this Agreement.

5. Nothing in this Consent Agreement shall be construed as an admission of liability or fault by Kerr-McGee.

VIII. OTHER CLAIMS; COVENANT NOT TO SUE

Nothing in this Consent Agreement shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site, except that the Division covenants not to sue Kerr-McGee with respect to the Division's past oversight costs and its obligations to perform the perchlorate

remediation at the seep adjacent to the Las Vegas Wash so long as Kerr-McGee is in compliance with the terms of this Consent Agreement.

IX. APPLICABLE LAW

This Agreement shall be construed in accordance with and governed by the law of the State of Nevada.

X. EFFECTIVE DATE

This Agreement shall become effective when it is fully executed by the parties. The effective date will be the date of last signature.

XI. TERMINATION

This Agreement shall terminate upon the occurrence of any of the following three events:

1. The Division and Kerr-McGee enter a new consent agreement to govern long-term remedial activity with respect to perchlorate contamination in groundwater at Henderson, and this later agreement expressly supersedes the present Agreement.
2. Kerr-McGee completes the work required under the removal Workplan pursuant to this Agreement and certifies to the Division that it has completed the work, and the Division issues written notice to Kerr-McGee confirming that its obligations under the Agreement have been fulfilled.
3. Any agency or department of the United States government asserts and undertakes lead responsibility for addressing perchlorate contamination at Henderson.

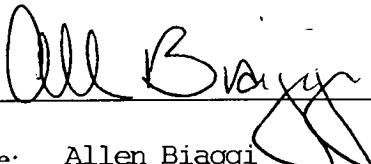
XII. SIGNATORIES

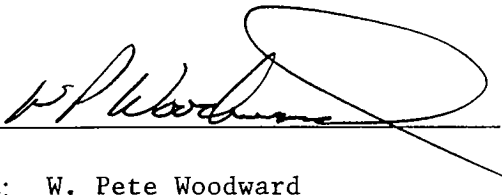
Each undersigned individual represents and warrants that he or she is fully authorized by the party he or she represents to enter into this Agreement and to legally bind such party to the terms and conditions of this Agreement.

IN WITNESS WHEREOF, the Division and Kerr-McGee execute this Consent Agreement by their duly authorized representatives on this 26 day of July, 1999.

THE STATE OF NEVADA
DIVISION OF ENVIRONMENTAL
PROTECTION

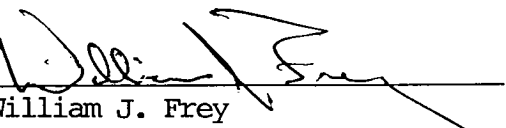
KERR-McGEE CHEMICAL LLC

By: 
Name: Allen Biaggi
Title: Administrator
Date: July 28, 1999

By: 
Name: W. Pete Woodward
Title: Senior Vice President
Date: July 26, 1999

APPROVED AS TO FORM ONLY this 28th day of July, 1999.

ATTORNEY GENERAL

By: 
William J. Frey
Deputy Attorney General

ATTACHMENT 2

Legal Description
of
Proposed Land Use

**LEGAL DESCRIPTION
AMMONIUM PERCHLORATE
COLLECTION FACILITY
(U.S.B.R.)**

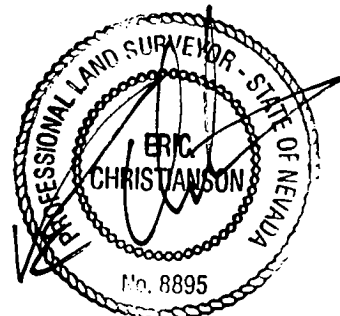
A PORTION OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 30, TOWNSHIP 21 SOUTH , RANGE 63 EAST, M.D.M., CITY OF HENDERSON, CLARK COUNTY, NEVADA MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SECTION 30, TOWNSHIP 21 SOUTH, RANGE 63 EAST, M.D.M.; THENCE ALONG THE SOUTH LINE THEREOF, NORTH 88°53'32" EAST, 565.00 FEET TO THE POINT OF BEGINNING; THENCE LEAVING SAID SOUTH LINE, NORTH 01°06'28" WEST, 500.00 FEET; THENCE NORTH 88°53'32" EAST, 625.00 FEET; THENCE SOUTH 01°06'28" EAST, 500.00 FEET TO A POINT ON AFOREMENTIONED SOUTH LINE OF SECTION 30; THENCE ALONG SAID SOUTH LINE SOUTH 88°53'32" WEST, 625.00 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS APPROXIMATELY 7.17 ACRES.

BASIS OF BEARING

NORTH 89°39'26" EAST - BEING THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 36, TOWNSHIP 21 SOUTH, RANGE 62 EAST, M.D.M., CITY OF HENDERSON, CLARK COUNTY, NEVADA AS SHOWN ON SHEET C-1 DATED 7/27/98 OF THE WATER RECLAMATION FACILITY PHASE IA IMPROVEMENT PROJECT FOR THE CITY OF HENDERSON, CLARK COUNTY, NEVADA.



8/2/99

ATTACHMENT 2

Legal Description
of
Proposed Land Use

N

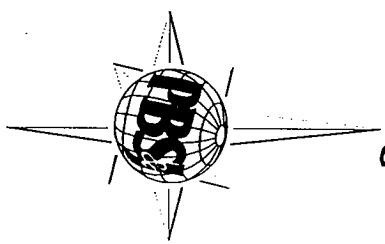
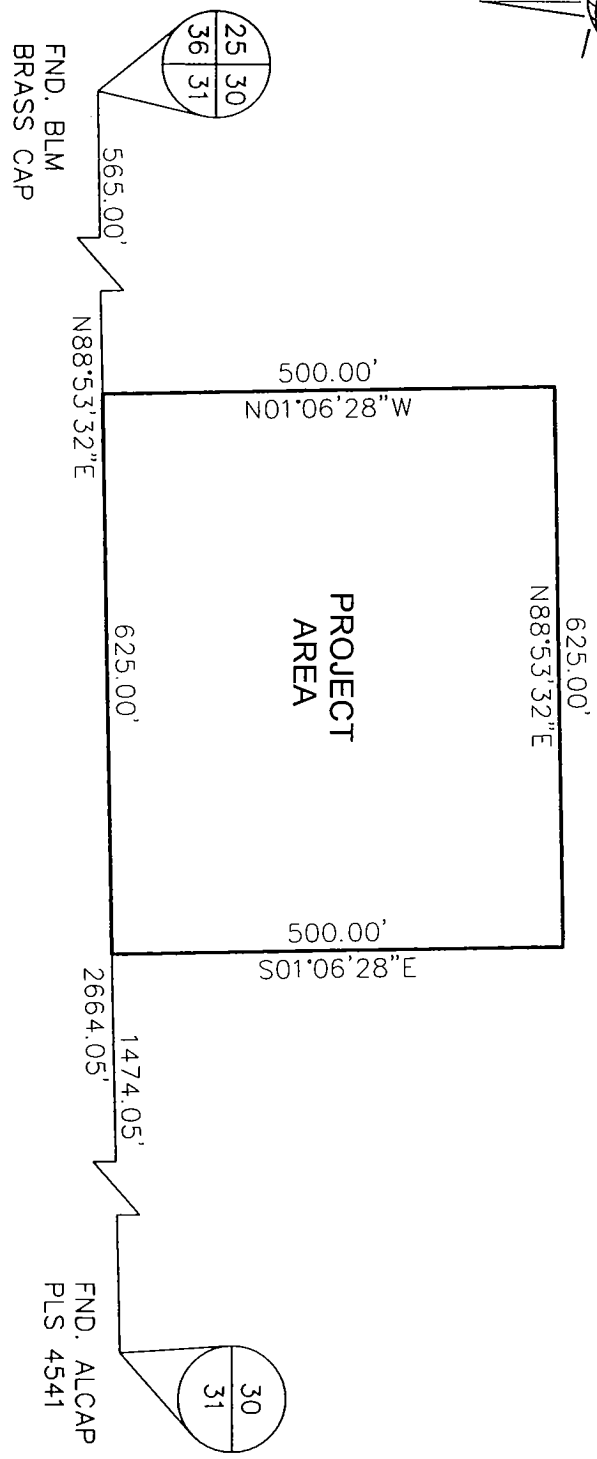


EXHIBIT TO ACCOMPANY APPLICATION
 A PORTION OF THE SOUTHWEST QUARTER (SW1/4) OF
 SECTION 30, TOWNSHIP 21 SOUTH, RANGE 63 EAST, M.D.M.,
 CITY OF HENDERSON, CLARK COUNTY, NEVADA



045EXHIB.DWG



901 N. Green Valley Pkwy.
 Suite 100
 Henderson, Nevada 89014
 Telephone: 702/263-7275
 Fax: 702/263-7200

ENGINEERING • PLANNING • SURVEYING • CONSTRUCTION SERVICES

UNITED STATES BUREAU OF RECLAMATION EXHIBIT TO ACCOMPANY APPLICATION	JOB NO. 511045	DRAWN EPC	DATE 7/30/99
	SHEET NO. 10F1	CHECKED CDK	SCALE NTS



KERR-McGEE CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

Law Department
Environmental Remediation

W. O. Green, III
Senior Counsel

Writer's Direct Number
(405) 270-2791
(405) 270-2863 Fax

July 26, 1999

RECEIVED

VIA FEDERAL EXPRESS

JUL 27 1999 2

William Frey, Esq.
Deputy Attorney General
State of Nevada
100 North Carson Street
Carson City, Nevada 89701

**OFFICE OF ATTORNEY GENERAL
DEPUTY ATTORNEY GENERAL**

Dear Bill:

Enclosed are two executed originals of the Consent Agreement by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("NDEP" or "Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). After the Division has signed both sets of the Consent Agreement, please keep one executed set for your files and return one executed set back to this office at the following address:

Kerr-McGee Corporation
Attn: W. O. Green, III
123 Robert S. Kerr Ave.
Oklahoma City, OK 73102

Thank you for your assistance in this matter.

Sincerely,

W. O. Green, III
Senior Attorney

WOG/rb

Enclosures

cc: P. Corbett
J. T. Smith

CONSENT AGREEMENT

This Consent Agreement is made and entered into this 26 day of July, 1999, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("NDEP" or "Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). Kerr-McGee and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Division is designated as the state water pollution control agency for Nevada and is empowered to administer and enforce the Nevada Water Pollution Control Law, Nevada Revised Statutes ("NRS") §§ 445.131 to 445.354, inclusive;

WHEREAS, Kerr-McGee has since 1967 owned and operated a plant at Henderson, Nevada used to produce ammonium perchlorate, which same facility Kerr-McGee asserts was previously owned by the United States Navy and others for the manufacture of perchlorate products and intermediates;

WHEREAS, in Henderson, to the southwest of Kerr-McGee's facility, ammonium perchlorate was manufactured by Pacific Engineering and Production Co. of Nevada ("PEPCON");

WHEREAS, sampling of groundwater at Kerr-McGee's and PEPCON's sites and in areas to the north and east of these facilities, approaching the Las Vegas Wash has indicated elevated levels of perchlorate in groundwater which are presumptively associated with historical operations at Kerr-McGee's and PEPCON's facilities;

WHEREAS, the Division has recently identified a groundwater seep north of the BMI lower ponds and adjacent to the Las Vegas Wash, believed to be located within the SE/4 of the

SE/4 of the SW/4, Sec. 30, T21S, R63, Clark County, Nevada, and the Division believes that expeditious action to capture this seep should materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

WHEREAS, Kerr-McGee has been cooperating with the Division in the further delineation of groundwater plumes of perchlorate and in the investigation of appropriate and feasible means to remediate this contamination, and Kerr-McGee has already constructed an eleven acre, lined impoundment at its Henderson facility and through use of this impoundment is currently removing substantial quantities of perchlorate from groundwater each day;

WHEREAS, Kerr-McGee desires to continue to cooperate fully with the Division in addressing the potential problem of perchlorate contamination in the Henderson, Nevada area, while preserving its rights to seek contribution from third parties who are likely to share responsibility for perchlorate contamination, including the United States Navy and PEPCON;

NOW, THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, and intending to be legally bound hereby, the Division and Kerr-McGee agree as follows:

I. STATEMENT OF PURPOSE

The Division and Kerr-McGee are entering into this agreement for three interrelated purposes:

1. To assure prompt implementation of a removal action to capture and contain perchlorate contaminated groundwater (the "seep") surfacing north of the BMI lower ponds and adjacent to the Las Vegas Wash and thereby to materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

2. To establish a framework for continued development by Kerr-McGee, in cooperation with the Division, of a plan to address more broadly perchlorate contamination in groundwater at Henderson, Nevada, including activities to address perchlorate at the Pittman Lateral area, and thereby achieve substantial, long-term remediation of perchlorate contamination at Henderson.

3. To provide for reimbursement to the Division of Kerr-McGee's fair share of oversight costs that the Division has incurred, and may in the future incur, with respect to the investigation and remediation of this perchlorate contamination in groundwater.

II. WORK TO BE PERFORMED

1. The parties intend that the work to be performed in accordance with this Agreement shall be carried out in manner consistent with applicable federal and Nevada statutes, implementing regulations, and with the National Contingency Plan, 40 C.F.R. § 300.1 *et seq.*

2. Within 15 days of execution of this Agreement, Kerr-McGee shall submit a Workplan detailing the removal measures that it plans to implement to capture and control the groundwater seep identified in the Las Vegas Wash area. The plan shall be consistent with the following key elements:

- (a). Kerr-McGee anticipates that completion of testing, site construction and equipment deliveries will allow the initiation of recovery of perchlorate at the seep in October 1999.
- (b). Treatment of perchlorate is expected to involve removing at least 97 percent of the perchlorate by ion exchange prior to discharge of the water.

(c). The parties recognize that permitting for seep access, construction and treated water discharge will require a concerted effort between Kerr-McGee and the agencies involved to meet the October 1999 deadline.

(d). Although Kerr-McGee believes that initial ion exchange technical results are promising, if technical obstacles arise, Kerr-McGee may submit a modified treatment plan to the Division.

The plan shall contain a schedule for implementation of the necessary control measures. Upon approval of this Workplan, it shall become an enforceable obligation pursuant to this decree. The parties will endeavor to reach mutual agreement on any changes to the Workplan after its submission, but, failing such agreement, the Division's written determination of necessary changes shall control, subject to Kerr-McGee's right to seek dispute resolution under Section IV below. The parties acknowledge that any such Workplan and schedule must take into account the necessity of a permit or other approval for discharge of water from the seep after removal of perchlorate.

3. No later than 60 days from the date of execution of this Agreement, Kerr-McGee shall submit a second Workplan and schedule setting forth a proposed long-term remedy to perchlorate contamination in the groundwater at Henderson. The Workplan must identify a system for long-term capture and treatment of perchlorate contamination in groundwater and for discharge of effluent from this perchlorate removal system. Such plan, at a minimum, shall include activities addressed to recover perchlorate contamination at the Pittman Lateral area, which activities will begin no later than December 31, 1999.

4. The parties agree that, upon submission of this second Workplan addressing long-term remedial issues, they will promptly enter good faith discussions of a consent agreement to

govern implementation and operation of this long-term remedy. The parties further agree to cooperate in resolving any issues that may remain regarding discharge of groundwater after treatment for perchlorate, including cooperation on issues relating to necessary permits.

III. STIPULATED PENALTIES

Unless there has been a written modification approved by NDEP or a Force Majeure under Section V, any failure by Kerr-McGee to meet a schedule deadline or an approved Workplan condition may result in NDEP assessing stipulated penalties against Kerr-McGee. The following table reflects the maximum penalties that may be imposed. Nothing in this Agreement shall be construed to limit in any manner NDEP's discretion with respect to whether to take enforcement action or to assess less than the maximum penalty. Failure to commence or complete work as described in the approved Workplan at the scheduled time may result in the following penalties subject, however, to a cap of \$250,000:

<u>Period of Noncompliance</u>	<u>Maximum Penalty per Day</u>
1 st – 7 th day	\$ 1,000
8 th – 21 st day	\$ 2,500
22 nd day and thereafter	\$ 5,000

The assessment of stipulated penalties shall not alter Kerr-McGee's obligation to comply with the terms of this Agreement.

IV. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this Consent

Agreement. If Kerr-McGee fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If Kerr-McGee disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, Kerr-McGee shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute which arises under or with respect to this Consent Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed ten (10) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within ten (10) days after the conclusion of the informal negotiation period, Kerr-McGee invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position Kerr-McGee claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for Kerr-McGee's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by Kerr-McGee, and any matters which it considers necessary for the Administrator's determination. The Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to

answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for an oral presentation.

5. Within fifteen (15) days following receipt of a Statement of Position, or after any oral presentation by Kerr-McGee, the Administrator shall issue his/her decision. The Administrator's written decision shall include a response to Kerr-McGee's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this Consent Agreement, and shall be considered the Department's final decision and an exhaustion of Kerr-McGee's administrative remedies.

6. As to any final decision of the Administrator, Kerr-McGee may seek judicial review as provided by State law and regulations.

V. FORCE MAJEURE

1. Kerr-McGee shall perform the requirements of this Consent Agreement within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. Kerr-McGee shall have the burden of proving such a *force majeure*. A *force majeure*, for purposes of this Consent Agreement, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of Kerr-McGee, or of any person or entity controlled by Kerr-McGee, which delays or prevents the timely performance of any obligation under this Consent Agreement despite Kerr-McGee's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes and lockouts, by other than Kerr-McGee employees, national emergencies, delays in obtaining access or use of property not owned or controlled by Kerr-McGee despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from

the Division or any other public agency that occur despite Kerr-McGee's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the Consent Agreement. A *force majeure* does not include (i) increased costs of the work to be performed under the Consent Agreement, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of Kerr-McGee's obligations under this Consent Agreement, whether or not caused by a *force majeure* event, Kerr-McGee shall notify the Division orally within two (2) business days of when Kerr-McGee first knew that the event might cause a delay. If Kerr-McGee wishes to claim a *force majeure* event, then within five (5) business days thereafter, Kerr-McGee shall provide to the Division a written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Kerr-McGee's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of Kerr-McGee, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. Kerr-McGee shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Kerr-McGee from asserting any claim of *force majeure* for that event.

3. The Division shall notify Kerr-McGee in writing of its *force majeure* determination within ten (10) days after receipt of the written notice from Kerr-McGee. If the Division determines that the delay has been or will be caused by circumstances constituting a

force majeure event, the time for performance of the obligations under this Consent Agreement that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless Kerr-McGee can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and Kerr-McGee cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, of if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section IV of this Consent Agreement.

VI. REIMBURSEMENT OF OVERSIGHT COSTS

1. Kerr-McGee shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement, following the effective date and for the effective period of this Consent Agreement. Kerr-McGee also agrees upon the effectiveness of this Agreement promptly to reimburse the Division for its share of the past oversight costs related to perchlorate as of the 30th day of June 1, 1999, in the amount of \$52,824.91.

2. The Division shall account for oversight costs associated with implementing this Consent Agreement and related work and shall submit to Kerr-McGee copies of all invoices on a quarterly basis, commencing with the first calendar quarter after the effective date of this Consent Agreement. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or cost details for administrative and vendor expenses (such as travel, training,

equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by Kerr-McGee of the invoices. Kerr-McGee may dispute particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of any such dispute, Kerr-McGee shall pay in a timely fashion undisputed costs. With respect to the disputed cost, Kerr-McGee may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section IV.

3. All payments due by Kerr-McGee shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and Kerr-McGee's name and address.

VII. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Kerr-McGee's failure to comply with any of the requirements of this Consent Agreement or of any requirement of federal or state laws, regulations, or permit conditions. Except as provided in Section VIII (Other Claims; Covenant Not to Sue), this Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State.

This Consent Agreement in no way relieves Kerr-McGee of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by Kerr-McGee pursuant to this Consent Agreement subject to Dispute Resolution under Section IV.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this Agreement, or (2) any applicable provision of state or federal law, subject to the Covenant Not To Sue under Section VIII.

4. Kerr-McGee reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this Agreement.

5. Nothing in this Consent Agreement shall be construed as an admission of liability or fault by Kerr-McGee.

VIII. OTHER CLAIMS; COVENANT NOT TO SUE

Nothing in this Consent Agreement shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site, except that the Division covenants not to sue Kerr-McGee with respect to the Division's past oversight costs and its obligations to perform the perchlorate

remediation at the seep adjacent to the Las Vegas Wash so long as Kerr-McGee is in compliance with the terms of this Consent Agreement.

IX. APPLICABLE LAW

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1. The Division and Kerr-McGee enter a new consent agreement to govern long-term remedial activity with respect to perchlorate contamination in groundwater at Henderson, and this later agreement expressly supersedes the present Agreement.
2. Kerr-McGee completes the work required under the removal Workplan pursuant to this Agreement and certifies to the Division that it has completed the work, and the Division issues written notice to Kerr-McGee confirming that its obligations under the Agreement have been fulfilled.
3. Any agency or department of the United States government asserts and undertakes lead responsibility for addressing perchlorate contamination at Henderson.

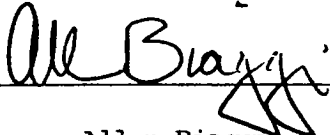
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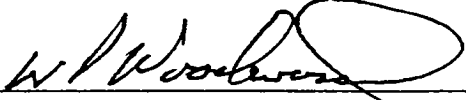
Each undersigned individual represents and warrants that he or she is fully authorized by the party he or she represents to enter into this Agreement and to legally bind such party to the terms and conditions of this Agreement.

IN WITNESS WHEREOF, the Division and Kerr-McGee execute this Consent Agreement by their duly authorized representatives on this 26 day of July, 1999.

THE STATE OF NEVADA
DIVISION OF ENVIRONMENTAL
PROTECTION


KERR-McGEE CHEMICAL LLC

By: 
Name: Allen Biaggi
Title: Administrator
Date: July 28, 1999

By: 
Name: W. Pete Woodward
Title: Senior Vice President
Date: July 26, 1999

APPROVED AS TO FORM ONLY this 28th day of July, 1999.

ATTORNEY GENERAL

By: 

July 6, 1999

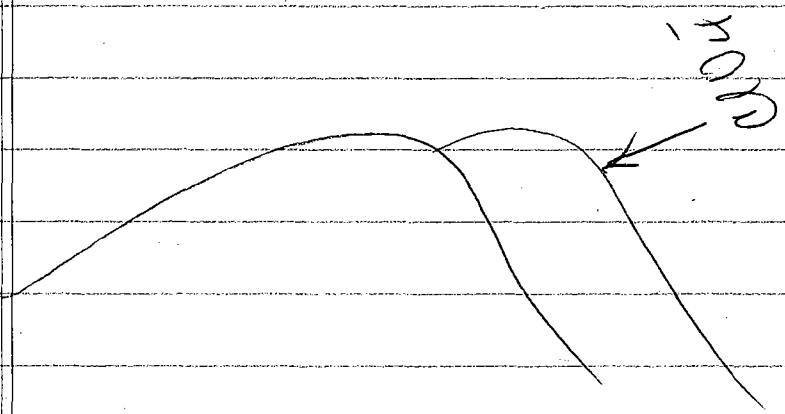
KMCC Update Meeting

- Discussing piping of water to existing pipeline + also building new pond. Also looked into RO
- US Filter have ion exchange technology which is showing 40-50:1 reduction. Regenerant can be placed into existing pond w/out running out of capacity
- Seep water \approx 70 ppm silica - minus RO unit membranes looked at pretreatment option - would result in 13 tons/day sludge + only 8x reduction in ClO_4^-
- Looked at cost of one time use resin too expensive. US Filter looking at one specific for ClO_4^- but able to regenerate. Looking at 40x reduction. Would locate 4 semi trailers down at wash. 2 sand filters, 2 resin beds. Resin would be regenerated at plant.
- Will not reduce TDS at all - need to do several tests of resin to see if efficiency reduces w/ each run

- Want to run 12-15 passes w/ reuse to be comfortable. Have already done some and think whole thing would take ~ 3 wks.

- May take 2-4 months to get entire thing set up.

800-1000 gpm @ 10,000 TDS } water which will need
1100-1300 BOD/COD } to be discharged



ENVIRONMENTAL
PROTECTION

J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

DIRECT FACSIMILE NUMBER
(202) 778-5555

jtsmith@cov.com

COVINGTON & BURLING

1201 PENNSYLVANIA AVENUE, N. W.

P.O. BOX 7566

WASHINGTON, D.C. 20044-7566

(202) 662-6000

FACSIMILE: (202) 662-6291

LECONFIELD HOUSE
CURZON STREET
LONDON W1Y 8AS
ENGLAND

TELEPHONE: 44-171-495-5655
FACSIMILE: 44-171-495-3101

KUNSTLAAN 44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-549-5230
FACSIMILE: 32-2-502-1598

June 30, 1999

VIA FEDERAL EXPRESS

Doug Zimmerman
Department of Conservation
and Natural Resources
Division of Environment Protection
333 West Nye Lane
Carson City, Nevada 89706-0851

Dear Doug:

At Susan Crowley's request, I am forwarding you a revised version of the proposed consent agreement with respect to perchlorate. The draft that you forwarded Susan on June 18 omitted significant portions of the version that we sent to NDEP on June 7. It is worth noting that the June 7 draft derived in large measure from a draft consent agreement discussed by Kerr-McGee representatives and Bill Frey during 1998. It was our understanding that this draft was largely agreed. Accordingly, we assumed it would be appropriate to use it as a starting point for our current drafting efforts.

Having received no explanation why we shouldn't use the prior draft as a starting point, we are resubmitting our June 7 draft, modified to address a number of the points in your June 18 draft. In particular:

- The new draft sets a deadline for submission of a workplan and schedule. This provision is a "placeholder." It is our understanding that discussion of the content of the workplan is ongoing and the NDEP and Kerr-McGee plan to meet on workplan issues on July 6.
- It includes stipulated penalties, but at a lower rate than the amounts proposed in the NDEP draft. The latter are significantly in excess of the stipulated penalties previously agreed in the Common Areas and Kerr-McGee Phase II consent decrees and appear unduly harsh in

June 30, 1999

Page 2

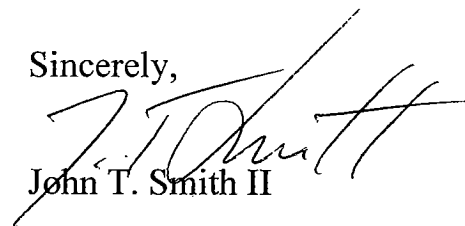
light of Kerr-McGee's track record of good faith efforts to work with NDEP on the perchlorate problem.

- It makes clear NDEP will recover its past oversight costs, but invites disclosures by NDEP of the amount it seeks before Kerr-McGee commits to payment of this amount.

You should note that Kerr-McGee strongly believes that any workplan to be covered by this consent agreement should undergo public comment. As you are aware, opportunity for public involvement is prescribed by the National Contingency Plan and, as such, may be a prerequisite for Kerr-McGee in seeking to recover these response costs from other potentially responsible parties such as the U.S. Navy.

Given the scope of our apparent differences regarding the appropriate approach to the consent agreement, it seems worthwhile to schedule a face-to-face meeting, including NDEP, Kerr-McGee and their respective counsel. In such a meeting our differences may be more expeditiously resolved than through continued exchange of divergent drafts. For this purpose, we would like to suggest a meeting on the morning of July 15, in Henderson or, if necessary, in Carson City. At that time we would also be prepared to discuss the concern you have recently raised with Susan Crowley regarding the Pittman lateral.

Sincerely,



John T. Smith II

Attachment

cc: William Frey, Esq.
Bill Green, Esq.
Susan Crowley
Pat Corbett

D R A F T: JUNE 28, 1999

CONSENT AGREEMENT

This Consent Agreement is made and entered into this _____ day of _____, 1999, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). Kerr-McGee and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Division is designated as the state water pollution control agency for Nevada and is empowered to administer and enforce the Nevada Water Pollution Control Law, Nevada Revised Statutes ("NRS") §§ 445.131 to 445.354, inclusive;

WHEREAS, through sampling and analyses begun in 1997, the Division has detected the presence of perchlorate in ground and surface waters in the area of the Las Vegas Wash and in Lake Mead, and the federal and state authorities have not yet finalized a level of perchlorate in drinking water which will be adequately protective of human health. [Provisional acceptable risk levels range from 18 to 33 micrograms per liter.]

WHEREAS, Kerr-McGee has since 1968 owned and operated a plant at Henderson, Nevada used to produce ammonium perchlorate, which same facility was previously owned by the United States Navy and others for the manufacture of perchlorate products, and intermediates;

WHEREAS, in Henderson, to the southwest of Kerr-McGee's facility, ammonium perchlorate was manufactured for approximately 30 years by Pacific Engineering and Production Co. of Nevada ("PEPCON");

WHEREAS, sampling of groundwater at Kerr-McGee's and PEPCON sites and in areas to the north and east of these facilities, approaching the Las Vegas Wash has indicated elevated levels of perchlorate in groundwater which are presumptively associated with historical operations at Kerr-McGee's and PEPCON's facilities;

WHEREAS, Kerr-McGee has been cooperating with the Division in the further delineation of the groundwater plume of perchlorate and in the investigation of appropriate and feasible means to remediate this contamination, and Kerr-McGee has already constructed an eleven acre, lined impoundment at its Henderson facility and through use of this impoundment is currently removing substantial quantities of perchlorate from groundwater each day;

WHEREAS, the Division has recently identified a groundwater seep north of the BMI lower ponds and adjacent to the Las Vegas Wash, believed to be located within the SE/4 of the SW/4 of the SW/4, Sec. 30, T21S, R63, Clark County, Nevada , and the Division believes that expeditious action to capture this seep should materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

WHEREAS, Kerr-McGee desires to continue to cooperate fully with the Division in addressing the potential problem of perchlorate contamination in the Henderson, Nevada area, while preserving its rights to seek contribution from third parties who are likely to share responsibility for perchlorate contamination, including the United States Navy and PEPCON; and

WHEREAS, Kerr-McGee has committed to the Division that it will promptly implement interim measures to further characterize, capture and contain the seep identified in the Las Vegas Wash area, and Kerr-McGee and Division have agreed that this Consent Agreement should govern the rights and responsibilities of the Parties with respect to this interim remedial effort.

NOW, THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, and intending to legally bound hereby, the Division and Kerr-McGee agree as follows:

I. STATEMENT OF PURPOSE

In entering this Consent Agreement, the mutual objective of the Parties is to cooperate in the design and implementation of interim measures that will allow the prompt capture and containment of the aforesaid seep in the area of the Las Vegas Wash, including the securing of all property access, permits and other environmental approvals that may pertain to wetlands and species protection, and rights-of-way or other property interests that may prove necessary. The Parties intend that the work to be performed in accordance with this Agreement and accepted by the Division will be consistent with the National Contingency Plan, 40 CFR § 300.1 *et seq.*

II. PARTIES BOUND

1. The provisions of this Consent Agreement shall apply to and be binding upon the Division, and upon Kerr-McGee, its successors and assigns.

2. Any change in ownership or corporate or partnership status of Kerr-McGee and any conveyance of title, easement, or other real property interest in its Henderson, Nevada facility or a portion of the facility, shall in no way alter Kerr-McGee's responsibilities under this Consent Agreement. In the event that Kerr-McGee proposes to sell or transfer all or a portion of the facility, or any real property subject to this Consent Agreement, Kerr-McGee shall, prior to such sale or transfer, provide written notice to such purchaser or transferee of the existence and terms of this Consent Agreement, and shall provide written notice to the Division concerning the sale or transfer not later than fifteen (15) days after such sale or transfer. Kerr-McGee shall also obtain, and provide to the Division a copy of, a written undertaking from any purchaser in

connection with such sale or transfer that said purchaser will comply with the foregoing notice requirements in connection with any subsequent transfer of such real property.

3. Kerr-McGee shall provide a copy of this Consent Agreement to all Contractors retained by it to conduct or monitor any portion of the work performed under this Consent Agreement not more than fourteen (14) days after either the Effective Date of this Consent Agreement or by the date on which such Contractor commences work relating to this Consent Agreement whichever is later. Kerr-McGee shall use best efforts to cause such persons or entities to comply with the terms of this Consent Agreement.

4. Kerr-McGee agrees to undertake all actions required by the terms and conditions of this Consent Agreement. Kerr-McGee shall finance the work and shall reimburse the Division for oversight costs as provided in this Consent Decree.

5. The undersigned representative of each Party to this Consent Agreement certifies that he or she is fully authorized by the Party whom he or she represents to enter into the terms and conditions of this Consent Agreement and to execute and legally bind that Party to it.

III. WORK TO BE PERFORMED

All work to be performed pursuant to this Agreement shall be carried out in a manner consistent with the applicable federal and Nevada statutes and their implementing regulations.

Within 30 days of execution of this Agreement, Kerr-McGee shall submit a Workplan detailing the measures it plans to implement to capture and control the groundwater seep identified in the Las Vegas Wash area. This plan shall contain a schedule for implementation of the necessary capture and control measures. After completion of the public participation requirements of Section IV and upon mutual agreement by the Parties on the Workplan and

accompanying schedule, they shall become an enforceable obligation pursuant to this Agreement.

IV. PUBLIC PARTICIPATION

Any Workplan and schedule received by the Division shall be made available to the public in accordance with applicable law. Following the notice and comment period, the Division and Kerr-McGee may mutually agree to revise the Workplan and schedule as necessary to address appropriately any issue regarding such document identified by the public during such comment period.

V. SAMPLING AND DATA AVAILABILITY

1. All final results of sampling, tests, modeling and other data (but not including raw data that has not been subject to QA/QC procedures) generated by Kerr-McGee, or on Kerr-McGee's behalf, pursuant to this Consent Agreement shall be submitted to the Division in any progress report required by this Consent Agreement. Kerr-McGee shall make all raw data available to the Division for review on request, and shall submit such data to the Division on written request. The Division will provide to Kerr-McGee validated data generated by the Division unless it is exempt from disclosure by any federal or state law or regulation.

2. Kerr-McGee shall notify the Division in writing at least five (5) working days prior to conducting any sampling described in the Workplan required by this Consent Agreement. If Kerr-McGee believes it must commence field activities without delay, Kerr-McGee may seek emergency telephone authorization from the Division Project Coordinator or, if the Division Project coordinator is unavailable, his/her Bureau Chief, the Administrator, or the Deputy Administrator, to commence such activities immediately. At the Division's oral or written request, Kerr-McGee shall provide or allow the Division or its authorized representative

to take split or duplicate samples of all samples collected by or on behalf of Kerr-McGee pursuant to this Consent Agreement.

VI. PROGRESS REPORT

Beginning with the second full month following the effective date of this Agreement, and throughout the effective period of this Consent Agreement, Kerr-McGee shall provide the Division with bi-monthly progress reports. Each progress report shall be filed with the Division no later than fifteen (15) days after the end of the two-month period for which the report provides information.

VII. STIPULATED PENALTIES

Unless there has been a written modification by NDEP, any failure by Kerr-McGee to meet a schedule deadline or an approved Workplan condition may result in NDEP assessing stipulated penalties against Kerr-McGee. All penalty amounts are maximum amounts. Nothing in this Agreement shall be construed to limit in any manner NDEP's discretion with respect to whether to take enforcement action or to assess less than the maximum penalty. Failure to commence, perform and/or complete work as described in the approved Workplan in a manner acceptable to NDEP at the scheduled time will result in the following penalties.

<u>Period of Noncompliance</u>	<u>Maximum Penalty per Day</u>
1 st – 7 th day	\$ 500
8 th – 21 st day	\$ 1,000
22 nd day and thereafter	\$ 2,000

The assessment of stipulated penalties shall not alter Kerr-McGee's obligation to comply with the terms of this Agreement.

VIII. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this Consent Agreement. If Kerr-McGee fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If Kerr-McGee disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, Kerr-McGee shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute which arises under or with respect to this Consent Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed thirty (30) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within thirty (30) days after the conclusion of the informal negotiation period, Kerr-McGee invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position Kerr-McGee claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for Kerr-McGee's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by Kerr-McGee, and any matters which it considers necessary for the Administrator's determination. The

Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for an oral presentation.

5. Within thirty (30) days following receipt of a Statement of Position, or by such later date within thirty (30) days after any oral presentation by Kerr-McGee as the Administrator may deem appropriate to adequately address such oral presentation, the Administrator shall issue his/her decision, which shall be binding on Kerr-McGee and unappealable unless, within twenty (20) days after receipt of the decision, Kerr-McGee exercises its rights as stated in paragraph 6 of this Section. The Administrator's written decision shall include a response to Kerr-McGee's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this Consent Agreement, and shall be considered the Division's final decision as provided in paragraph 6 of this Section.

6. As to any final Division decision, Kerr-McGee may pursue the dispute before the State Environmental Commission ("SEC") as a "contested case" pursuant to NRS §§ 233B.010 *et seq.* and NAC §§ 445.988 – 445.995, and shall be entitled to both administrative and judicial review as provided therein.

IX. FORCE MAJEURE

1. Kerr-McGee shall perform the requirements of this Consent Agreement within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. Kerr-McGee shall have the burden of proving such a *force majeure*. A *force majeure*, for purposes of this Consent Agreement, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of Kerr-McGee, or of any person or

entity controlled by Kerr-McGee, which delays or prevents the timely performance of any obligation under this Consent Agreement despite Kerr-McGee's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes, lockouts, national emergencies, delays in obtaining access or use of property not owned or controlled by Kerr-McGee despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from the Division or any other public agency that occur despite Kerr-McGee's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the Consent Agreement. A *force majeure* does not include (i) increased costs of the work to be performed under the Consent Agreement, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of Kerr-McGee's obligations under this Consent Agreement, whether or not caused by a *force majeure* event, Kerr-McGee shall notify the Division orally within two (2) business days of when Kerr-McGee first knew that the event might cause a delay. If Kerr-McGee wishes to claim a *force majeure* event, then within ten (10) days thereafter, Kerr-McGee shall provide to the Division a written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Kerr-McGee's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of Kerr-McGee, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. Kerr-McGee

shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Kerr-McGee from asserting any claim of *force majeure* for that event.

3. The Division shall notify Kerr-McGee in writing of its *force majeure* determination within fifteen (15) days after receipt of the notice from Kerr-McGee. If the Division determines that the delay has been or will be caused by circumstances constituting a *force majeure* event, the time for performance of the obligations under this Consent Agreement that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless Kerr-McGee can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and Kerr-McGee cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, or if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section VII of this Consent Agreement.

X. REIMBURSEMENT OF OVERSIGHT COSTS

1. Kerr-McGee shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement, following the effective date and for the effective period of this Consent Agreement. Kerr-McGee also agrees promptly upon the effectiveness of this Agreement to reimburse the Division for past oversight costs in the amount of \$_____.

2. The Division shall account for oversight costs associated with implementing this Consent Agreement and related work and shall submit to Kerr-McGee copies of all invoices on a

quarterly basis, commencing with the first full calendar quarter after the effective date of this Consent Agreement. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or cost details for administrative and vendor expenses (such as travel, training, equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by Kerr-McGee of the invoices. Kerr-McGee may dispute a particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of any such dispute, Kerr-McGee shall pay in a timely fashion undisputed costs. With respect to the disputed cost, Kerr-McGee may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section VIII.

3. All payments due by Kerr-McGee shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and Kerr-McGee's name and address.

XI. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Kerr-McGee's failure to comply with any of the requirements of this Consent Agreement or of any requirement of federal or state

laws, regulations, or permit conditions. Except as provided in Section XII (Other Claims; Covenant Not to Sue), this Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State. This Consent Agreement in no way relieves Kerr-McGee of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by Kerr-McGee pursuant to this Consent Agreement subject to Dispute Resolution under Section VIII.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this Agreement, or (2) any applicable provision of state or federal law.

4. If the Division determines that activities in compliance or noncompliance with this Consent Agreement have caused a release of perchlorate that may present an imminent and substantial hazard to human health, welfare, and/or the Environment, the Division may order Kerr-McGee to stop further implementation of this Consent Agreement for such period of time as the Division determines may be needed to abate any such Release and/or to undertake any action which the Division determines is necessary to abate such Release.

5. This Consent Agreement is neither a permit nor a modification of a permit. The Parties acknowledge and agree that the Division's approval of any Workplan hereunder does not constitute a warranty or representation that the Workplan will achieve the required or appropriate investigatory or performance standards.

6. Notwithstanding any other provision of this Consent Agreement and except as provided in Section VIII (Dispute Resolution), no action or decision by the Division pursuant to

this Consent Agreement including, without limitation, decisions by the Administrator, shall constitute final agency action giving rise to any right of judicial review prior to the Division's initiation of a judicial action to enforce this Consent Agreement, including an action to collect penalties or an action to compel Kerr-McGee's compliance with the terms and conditions of this Consent Agreement.

7. Kerr-McGee reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted to the Site and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this Agreement.

8. In any subsequent administrative or judicial proceeding initiated by the State for injunctive or other appropriate relief relating to the Site, Kerr-McGee shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, claim-splitting, or other defenses based upon any contention that the claims raised by the State of Nevada in the subsequent proceeding were or should have been raised in this Consent Agreement.

9. Nothing in this Consent Agreement shall be construed as an admission of liability by Kerr-McGee.

XII. OTHER CLAIMS; COVENANT NOT TO SUE

1. Nothing in this Consent Agreement shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising out of or relating in any way to the generation, storage, treatment,

handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site.

2. Notwithstanding any provision of this Consent Agreement to the contrary, the Division covenants not to sue Kerr-McGee for oversight costs incurred by the Division under this Consent Agreement in excess of the amounts specified in Section IX.

XIII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Agreement shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. Kerr-McGee shall obtain or cause its representative(s) to obtain all permits and approvals necessary under such laws and regulations.

XIV. GOVERNING LAW

The provisions and interpretation of this Consent Agreement shall be governed by the law of the State of Nevada.

XV. SEVERABILITY

If any provision or authority of this Consent Agreement or the application of this Consent Agreement to either Party or any circumstances is held by any judicial or administrative authority to be invalid, and such holding does not result in a material change in the rights or obligations of the Parties, the application of such provisions to other circumstances and the remainder of the Consent Agreement shall remain in force and shall not be affected thereby.

XVI. EFFECTIVE DATE

This Consent Agreement shall become effective on the ____ day of ____, 1999. This Consent Agreement may be executed in separate counterparts.

XVII. TERMINATION

After completion of the work required pursuant to the Workplan, Kerr-McGee shall submit to the Division a Statement of Completion, which certifies that Kerr-McGee has fulfilled all obligations under this Consent Agreement, including payment of any costs to the Division. Within a reasonable time after receipt of the Statement of Completion, the Division shall issue a written notice to Kerr-McGee that all obligations under this Consent Agreement have been fulfilled. If the Division determines that all obligations have not been fulfilled, such notice shall specify the obligations the Division believes must be fulfilled in order to satisfy this Consent Agreement. All obligations of Kerr-McGee created by the terms of this Consent Agreement shall be deemed satisfied and shall terminate upon issuance by the Division of written notice that Kerr-McGee has fulfilled all obligations under this Consent Agreement.

IN WITNESS WHEREOF, the Division and Kerr-McGee execute this Consent Agreement by their duly authorized representatives on this _____ day of June, 1999.

THE STATE OF NEVADA
DIVISION OF ENVIRONMENTAL
PROTECTION

KERR-McGEE CHEMICAL LLC

By:

By:

Name:

Name:

Title:

Title:

APPROVED AS TO FORM ONLY this _____ day of _____, 1999.

ATTORNEY GENERAL

Dear Mr. Smith

I would like to take the time to confirm my understanding of our meeting on July 7, 1999 and express the needs of the NDEP with respect to finalizing this agreement. If this agreement can not be finalized by July 16, 1999 the NDEP will proceed, as originally planned, with an administrative order under Nevada's water pollution or hazardous waste law. At Kerr McGee's request, NDEP is willing to negotiate and enter a consent agreement if it achieves the same overall results.

You have made it clear that Kerr McGee intends to bring an action under CERCLA for contribution against other potentially responsible parties. As you suggested I have continued to research this and have not found that this intent on your part requires any action from the State. Any party that undertakes a response action is entitled to bring suit for recovery of response costs as long as the response was performed consistent with the NCP.

In an attempt to arrive at agreement quickly we provided you with a concise agreement that met our concerns and we believed yours. We are concerned with the length of time consumed with negotiating what started as a relatively simple agreement. Based on our discussion, a major portion of this delay is attributable to your attempts to preserve your CERCLA rights. Rights which our document in no way negated. Kerr McGee's rights to preserve its ability to seek contribution impose obligations on Kerr McGee and not NDEP.

Based on the foregoing the following clauses should be added:

Whereas NDEP fully intended to issue an order pursuant to state statute and upon Kerr McGee's request enters into this consent agreement.

Whereas Kerr McGee intends to file actions for contribution to recover response costs Kerr McGee will assure that the work to be performed in accordance with this Agreement will be consistent with the National Contingency Plan, 40 CFR...

Dear Mr. Smith

I would like to take the time to confirm my understanding of yesterday's discussions. Doug Zimmerman confirmed that he still believes, as I do, that issuing an administrative order under Nevada's water pollution or hazardous waste law is the simplest and most direct way to proceed. However, at Kerr McGee's request NDEP is willing to negotiate and enter a consent agreement if it achieves the same overall results.

You have made it clear that Kerr McGee intends to bring an action under CERCLA for contribution against other potentially responsible parties. As you suggested I have continued to research this and have not found that this intent on your part requires any action from the State. Any party that undertakes a response action is entitled to bring suit for recovery of response costs as long as the response was performed consistent with the NCP.

In an attempt to arrive at agreement quickly we provided you with a concise agreement that met our concerns and we believed yours. We are concerned with the length of time consumed with negotiating what started as a relatively simple agreement. Based on yesterday's discussion a major portion of this delay is attributable to your attempts to preserve your CERCLA rights. Rights which our document in no way negated. Kerr McGee's rights to preserve its ability to seek contribution impose obligations on Kerr McGee and not NDEP.

NDEP's goal is to arrive at an agreement by next Friday. If agreement is not reached by then NDEP will return to its original plan of issuing an order. Please do not take this as a threat, but rather a bald statement that something must occur in a relatively short time frame. While we have no intent to interfere with any contribution action you might bring we do not believe that concern should dictate the terms of the agreement.


Based on the foregoing the following clauses should be added.

Whereas NDEP fully intended to issue an order pursuant to state statute and upon Kerr McGee's request enters into this consent agreement.

Whereas Kerr McGee intends to file actions for contribution to recover response costs Kerr McGee will undertake to

DZ
Your copy.

Post-It® Fax No:	7671	Date	6/30	# of pages	11
To:	Allen + Doug		From:	Brenda	
Co./Dept.		Co.			
Phone #		Phone #			
Fax #		Fax #			

FAX TRANSMISSION			
TO:	NAME:	Brenda Pohlmann	
	ORGANIZATION:	NDEP, Bureau of Corrective Actions	
	MAIL CODE:		
	FAX NUMBER:	(702) 486-2863	
	PHONE NUMBER:	(702) 486-2857	
FROM:		Kevin Mayer U.S. Environmental Protection Agency Region IX, SFD-7-2 75 Hawthorne Street San Francisco, CA 94105-3901	
		DIVISION:	Superfund
		PHONE NUMBER:	(415) 744-2248
		FAX NUMBER:	(415) 744-2180
DATE:	June 29, 1999		
PAGES (Including Cover)	11		
SUBJECT:	Perchlorate - Colorado River Board		
NOTES: Just received this today. I believe that Allen should be receiving a fax from EPA too, although I have not sent him one.			

- ① June 3 memo - Tim Fields - 2 pages
- ② June 18 memo - Norine Norman - 4 pages
- ③ EPA Region 9 Fact Sheet - June (barely) - 4 pages
(checked for nearly 6 weeks)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 3 1999

MEMORANDUM

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

SUBJECT: Release of Report on Perchlorate Toxicity Peer Review

FROM: Timothy Fields, Jr. *Timothy Fields, Jr.*
Acting Assistant Administrator
Office of Solid Waste and Emergency Response

TO: Interested Parties

Please find the attached final report of the external peer review workshop on the toxicity of perchlorate, held on February 10-11, 1999, in San Bernardino, California. The peer review workshop was conducted by Research Triangle Institute, a contractor to EPA's Office of Solid Waste and Emergency Response. Areas covered by the peer review included the draft toxicological review document for perchlorate, protocols and results of several recently completed and ongoing toxicological and ecological effects studies on perchlorate, and the harmonized human health oral risk benchmark (RfD) proposed for perchlorate in the toxicological review document.

The peer review workshop was sponsored by the EPA Office of Solid Waste and Emergency Response (OSWER) and Office of Water. The draft toxicological review document for perchlorate, entitled "Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization Based on Emerging Information", was prepared by EPA's National Center for Environmental Assessment (NCEA). The draft toxicological review document presented an updated human health risk assessment as well as a screening ecological assessment of newly performed studies on perchlorate. The updated human health assessment harmonizes noncancer and cancer approaches to derive a single proposed oral RfD based on precursor effects for both non-cancer health effects and thyroid cancer.

The panel concluded that the presentation of the data in the toxicological review document was generally well done but that further work is needed before the RfD proposed by EPA can be definitively evaluated. It recommended using thyroid hyperplasia (increase in cell number) rather than thyroid hypertrophy (increase in cell size) for the determination of the reference dose, since it concluded that hypertrophy is an adaptive effect, not an adverse effect. The panel recommended that a pathology working group (PWG) be convened to review the thyroid and brain tissue from all previous and pending studies. This PWG review will provide for a common nomenclature of lesions and for a consistent pathology review across studies. In addition, the peer reviewers identified a number of statistical issues that should be addressed by NCEA.

The peer reviewers commended NCEA's use of available biological and toxicological data to move in the direction of a harmonized approach to assessing cancer and noncancer endpoints,

and encouraged further use of the mode of action data in the determination of the RfD. The peer reviewers concluded that the RfD proposed by EPA in the toxicological review document (0.0009 mg/kg/d) is likely to be conservative, based upon the existing toxicological data base.

The panel found that the ecotoxicology studies were well done and support the screening ecological risk assessment. The major weaknesses of the screening ecological risk assessment (SERA) were identified as limited data on the current levels of perchlorate in the environment and the potential for long-term effects. These data limitations resulted in a SERA that was conservative both in terms of the risk-based effects thresholds suggested and the scope of the additional studies recommended. The lack of this information makes it difficult to determine what types of fish, wildlife and plants are at risk from perchlorate.

NCEA is currently working with the National Institute of Environmental Health Sciences on the establishment of a PWG to review the thyroid and brain tissue from all previous and pending studies. In the final toxicological review document, NCEA will address comments made in the peer review workshop report, and will review and incorporate data from additional studies that are currently ongoing, as well as the results of the PWG review.

Several months ago the Agency committed to a second external peer review as part of the process to characterize the potential human and ecotoxicological risks associated with perchlorate contamination. The purpose of the second external peer review will be to evaluate the additional data, the presentation and analyses of these data in the toxicological review document, and the draft final NCEA assessment. It is anticipated that a second peer review workshop will be held early in 2000. The second peer review may use a number of the peer reviewers that participated in the recent workshop. This next peer review is intended as part of the Integrated Risk Information System (IRIS) process. After revision to reflect any additional comments or recommendations, the final NCEA assessment will then go to IRIS consensus review.

EPA's Office of Research and Development will address in a separate memorandum the issue of the appropriate provisional reference dose for perchlorate pending the completion of the final toxicological review document with its associated health benchmark dose. In brief, it will recommend the continued use of the existing provisional reference dose range of 0.0001 to 0.0005 mg/kg-day, until such time as a final benchmark is approved.

Any questions regarding the peer review workshop report should be directed to Peter Grevatt (202-260-3100) or Dorothy Canter (202-260-2230) of my staff.

cc: P. Grevatt
D. Canter
N. Noonan
W. Farland
A. Jarabek



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 18 1999

OFFICE OF
RESEARCH AND DEVELOPMENT

SUBJECT: Interim Assessment Guidance for Perchlorate

FROM: Norine E. Noonan *Norine E. Noonan*
Assistant Administrator (8101R)

TO: Regional Administrators
Regional Waste Management Division Directors
Regional Water Management Division Directors

The purpose of this memorandum is to transmit the attached interim assessment guidance from the Office of Research and Development (ORD) relevant to Agency activities related to perchlorate. The development of this guidance is in response to requests to ORD from some of the Regional offices, as well as from individual States.

As you know, the Office of Solid Waste and Emergency Response (OSWER) has recently forwarded to you the final report of the February 1999, External Peer Review of the document entitled "Perchlorate Environmental Contamination: Toxicology Review and Risk Characterization." The external review document (ERD), subject of the peer review, was developed by ORD's National Center for Environmental Assessment (NCEA).

The human health and ecological assessment issues related to environmental contamination by perchlorate are complex. The ERD addressed an immediate need to bring more science into the assessment process, but at the time of the February 1999 peer review meeting, several key studies on perchlorate were underway or planned. These studies will provide some critical assessment information. These new data will be incorporated into the revised assessment document that will undergo a second external peer review in January 2000. Because ORD is committed to bringing the latest available science to bear on the human and ecotoxicology estimates, ORD is recommending that until the completion of the second review, EPA risk assessors and risk managers follow the attached interim guidance. This guidance has been reviewed by the Office of Water (OW), Office of Solid Waste and Emergency Response (OSWER), and the Office of General Counsel and is supported by both OW and OSWER.

We look forward to working with you as we come to closure on this aspect of the perchlorate contamination issues over the next nine months. If there are any questions or if you require additional information, do not hesitate to contact Annie Jarabek at 919-541-4847 (voice); 919-541-1818 (FAX); or jarabek.annie@epa.gov (E-mail).

Attachment

cc: Tim Fields, OSWER
Jonathan C. Fox, OW
William Farland, NCEA
Lt. Col. Dan Rogers, DoD
Annie Jarabek, NCEA

ORD Interim Guidance for Perchlorate

Because of remaining significant concerns and uncertainties that must be addressed in order to finalize a human health oral risk benchmark for perchlorate, the Office of Research and Development (ORD) recommends that Agency's risk assessors and risk managers continue to use the standing provisional RfD range of 0.0001 to 0.0005 mg/kg-day for perchlorate-related assessment activities. This recommendation is based on the determination that important new emerging data may have an impact on the proposed revised oral human health risk benchmark contained in the February 1999 External Review Document (ERD). Some background information and the reasons for this recommendation are detailed below.

In February 1999, an external peer review meeting was held in San Bernadino, California to review the document entitled "Perchlorate Environmental Contamination: Toxicology Review and Risk Characterization." This ERD was developed by ORD's National Center for Environmental Assessment (NCEA). The ERD, available on the Internet at <http://www.epa.gov/ncea/perch.htm>, was developed as part of a wider interagency effort to address environmental contamination issues related to perchlorate. More information on this effort is available at <http://www.epa.gov/ogwdw/cc/perchlor/perchlo.html>. The external peer review was sponsored by the Office of Solid Waste and Emergency Response (OSWER) and the Office of Water. The final peer review report of the February 1999 meeting has recently been transmitted to you by OSWER.

As explained in the ERD, the current range of a provisional RfD value for perchlorate spans from 0.0001 mg/kg-day to 0.0005 mg/kg-day; this range was issued by the NCEA Superfund Technical Support Center based on assessments in 1992 and revised in 1995. If state or local environmental authorities decide to pursue site-specific clean-up or other water management decisions based on this provisional RfD range by applying the standard default body weight (70 kg) and water consumption level (2 L/day), the resulting provisional clean-up levels or action levels would range from 4-18 parts per billion (ppb). It should be noted that no cancer assessment was performed at this time.

The ERD presented an updated human health risk assessment as well as a screening-level ecological assessment of newly performed studies on the toxicity of perchlorate. The updated health assessment harmonizes noncancer and cancer approaches to derive a single oral risk benchmark based on precursor effects for both neurodevelopmental effects and thyroid neoplasia. Both of these are historically established effects often observed after disturbances in the hypothalamic-pituitary-thyroid feedback system. By their nature, each of these effects is likely to have a biological threshold. The proposed revised oral human health risk benchmark is protective of potential carcinogenic effects based on new perchlorate data on the lack of its genotoxicity and the reversibility of induced thyroid hypertrophy/hyperplasia. The proposed revised oral human health risk benchmark is 0.0009 mg/kg-day. No traditional RfD or cancer slope factor was proposed in the ERD. If state or other local environmental authorities choose to apply the same default values as above to the revised oral benchmark, a site-specific clean-up or action level of 32 ppb would result.

The Agency has committed to another external peer review as part of the process to more completely and accurately characterize the human and ecotoxicological risks associated with perchlorate contamination and to make this information available through the Integrated Risk Information System (IRIS). In the next assessment, NCEA will address comments made in the February 1999 report, as well as review and incorporate data from additional studies that were either nearing completion or recommended at that time. In addition to recommended studies on pharmacokinetics, developmental effects testing in another species and repeat motor activity evaluations are underway. Another important recommended activity underway is a National Toxicology Program-sponsored pathology working group (PWG) review of the thyroid and brain tissue from all previous and pending studies. This PWG review will provide for a common nomenclature of lesions and for a consistent pathology review across studies, with the goal to reduce variability in the data. Further, an interlaboratory validation study of the hormone analyses (T4, T3, and TSH) across participating laboratories will be performed. Additional ecotoxicology studies, including some site-specific and farm gate analyses of food crops, are also either being reviewed or already underway.

The purpose of the next external peer review will be to evaluate these additional data and to review the draft final NCEA assessment. All of the perchlorate testing and study activities, whether underway, in review, or planned, are being timed to support the goal of the next external peer review in January 2000. As mentioned above, this next peer review is intended as part of the IRIS process. After revision to reflect any additional comments or recommendations, the final NCEA assessment will then go to IRIS consensus review.

Because new analyses and data are to be considered, we can predict that the human and ecotoxicology benchmarks are likely to change. The new estimates will reflect greater accuracy and may be either higher or lower than the harmonized benchmark proposed in the February 1999 document (0.0009 mg/kg-day). Therefore, ORD recommends that Agency risk assessors and risk managers continue to use the standing provisional RfD range of 0.0001 to 0.0005 mg/kg-day because of continued uncertainty with respect to the impact of the pending data and analyses on the final estimate. This recommendation helps to ensure that the Agency bases its risk management decisions on the best available peer reviewed science and is in keeping with the full and open participatory process embodied by the proposed series of peer review workshops. It should be noted, that due to the uncertainty of whether the final oral human health risk benchmark will increase or decrease based on the new data and analyses, the standing provisional RfD range is the more conservative of the estimates available at this time and, therefore, more likely to be public health protective in the face of this uncertainty. This is also consistent with Agency practice that existing toxicity estimates remain in effect until the review process to revise them is completed.

This document provides guidance to EPA Regions concerning Agency activities related to perchlorate. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in carrying out these activities. The guidance is designed to implement national policy on these issues. The document does not, however, substitute for EPA statutes or regulations; nor is it a regulation itself. Thus, it cannot impose legally-binding requirements on EPA or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. EPA may change this guidance in the future.



Region 9 Perchlorate Update

U.S. ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • 75 HAWTHORNE STREET • SAN FRANCISCO, CA • JUNE 1999

The U.S. Environmental Protection Agency (EPA) has been working in partnership with states, federal agencies, tribes, water suppliers and the private sector to address a recently discovered threat to water supplies from a component of solid rocket fuel and other sources. The Interagency Perchlorate Steering Committee (IPSC) is co-chaired by the EPA and the Department of Defense (DoD) and is comprised of representatives from 19 state, federal, and tribal agencies.

Background

Perchlorate originates as a contaminant in the environment from the solid salts of ammonium, potassium, or sodium perchlorate. The perchlorate part of the salts are quite soluble in water. The resultant anion (ClO_4^-) is very mobile in aqueous systems. It can persist for many decades under typical groundwater and surface water conditions, because of its resistance to react with other available constituents.

Ammonium perchlorate is manufactured for use as the oxidizer component and primary ingredient in solid propellant for rockets, missiles, and fireworks.

Large-scale production began in the United States in the mid-1940s. Because of its shelf life, it must be periodically washed out of the country's missile and rocket inventory and replaced with a fresh supply. Thus, large volumes of the compound have been disposed of since the 1940s in Nevada, California, Utah, and likely other states. Perchlorate salts are used on a large scale as a component of air bag inflators. Ammonium perchlorate is used in the manufacture of matches and in analytical chemistry.

Other uses of perchlorate salts include their use in nuclear reactors and electronic tubes, as additives in lubricating oils, in tanning and finishing leather, as a fixer for fabrics and dyes, in electroplating, in aluminum refining, in rubber manufacture, and in the production of paints and enamels. Chemical fertilizer also has been reported to be a potential source of perchlorate contamination.

The EPA had established a provisional reference dose (RfD) range based on assessments of existing information in 1992 and revised in 1995. By applying the standard default body weight (70 kg) and water consumption level (2 L/day), the resulting provisional cleanup or action levels would range from 4-18 parts per billion (ppb).

Prior to April 1997, perchlorate could not be detected at concentrations below 100 ppb. Many uncertainties remained about its toxicity, about how to remove it from water, or how extensive a problem perchlorate might pose to water supplies. In April 1997, the California Department of Health Services (CA DHS) developed a new analytical method to detect low levels of perchlorate (4ppb) in water. Within the last two years, this chemical has been found in the water supplies of over 15 million people in CA, NV and AZ and in surface or groundwater throughout the United States (AR, IA, IN, KS, MD, NM, NY, PA, TX, UT, WV).

Perchlorate is of concern because of:

- 1) Potential health effects at low concentrations;
- 2) the possibility that perchlorate may be widespread in the environment;
- 3) the expense of removing perchlorate from water and soils; and
- 4) the effects that perchlorate may have on ecosystems.

Research has been carried out at an accelerated pace to better understand the human health effects of perchlorate, examine possible ecological impacts, refine analytical methods, develop treatment technologies, and increase occurrence data, while keeping stakeholders informed and involved.

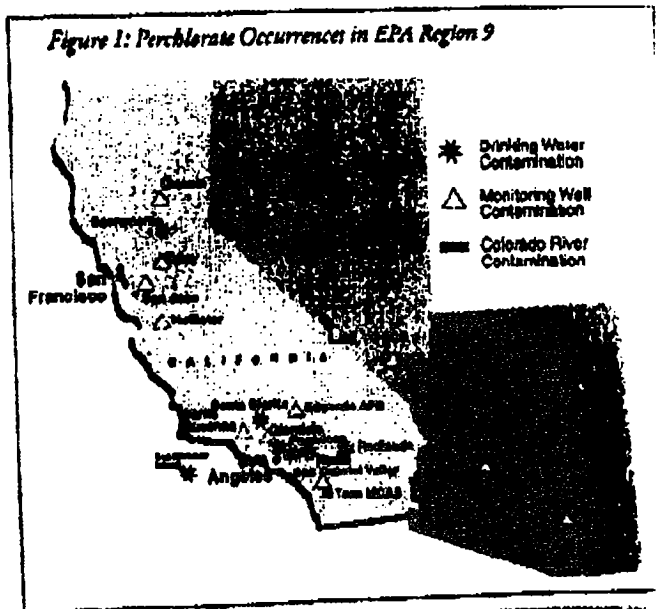
Toxicology

The EPA held an external peer review of the document entitled "Perchlorate Environmental Contamination: Toxicology Review and Risk Characterization" on

February 10-11, 1999 in San Bernardino, CA which was open to the public. The external review document (ERD), was developed by the EPA's Office of Research and Development, National Center for Environmental Assessment (ORD/NCEA). The ERD presented an updated human health risk assessment as well as a screening-level ecological assessment of newly performed studies on the toxicity of perchlorate. The updated human health risk assessment model harmonizes noncancer and cancer approaches to derive a single oral risk benchmark for perchlorate. The proposed revised oral human health risk benchmark is 0.0009 mg/kg-day. The proposed revised oral risk benchmark is an estimate of the amount of perchlorate, which when ingested daily over a lifetime is anticipated to be without adverse health effects (both noncancer and cancer) to humans, including sensitive subpopulations. Finalizing the oral risk benchmark requires completion of additional toxicology studies and further evaluation of toxicology results.

The EPA has committed to another external peer review as part of the process to more completely and accurately characterize the human and ecotoxicological risks associated with perchlorate contamination. In the next assessment, NCEA will address comments

Figure 1: Perchlorate Occurrences in EPA Region 9



made in the external peer review report, as well as review and incorporate data from additional studies that were either nearing completion or recommended at that time. The purpose of the next external peer review will be to evaluate these additional data and to review the final draft NCEA assessment on perchlorate. All of the perchlorate testing and study activities, whether underway, in review, or planned, are being timed to support the goal of the next external peer review in early 2000.

Because new analysis and data are to be considered, the human and ecotoxicology benchmarks are likely to change. The new estimates will reflect greater accuracy and may be either higher or lower than the harmonized benchmark proposed in the ERD. The Office of Research and Development has recommended that the EPA's risk assessors and risk managers continue to use the standing provisional reference dose (RfD) range of 0.0001 to 0.0005 mg/kg-day because of continued uncertainty with respect to the impact of the pending data and analyses. This recommendation helps to ensure that the EPA bases its risk management decisions on the best available peer reviewed science and is in keeping with the full and open participatory process of the series of external peer review workshops. The standing provisional RfD range is the more conservative of the estimates available at this time and, therefore, more likely to be protective of public health. This is also consistent with the EPA's practice that existing toxicity estimates remain in effect until the review process to revise them is completed.

Regulatory/Federal

There is currently no federal National Primary Drinking Water Regulation for perchlorate. It is on the EPA's Safe Drinking Water Act's Contaminant Candidate List, but before a determination to regulate can be made, data gaps must be filled regarding occurrence, health effects, treatment technologies, and analytical methods. Finding these answers for perchlorate is a very high priority.

Following the establishment of a final harmonized oral human health risk benchmark for perchlorate, the EPA will develop a drinking water Health Advisory. Based on the current proposed revised oral risk benchmark, and standard default body weight (70 kg) and water consumption (2 L/day) values, a drinking water equivalent level (DWEL) would be calculated at 31.5 ppb. It is important to recognize that the DWEL is a level that assumes all perchlorate exposure comes from drinking water and does not take into account the contribution of perchlorate from other sources, which will be considered in developing a Health Advisory.

Regulatory/States

In 1997, California established an action level of 18 ppb for perchlorate in public water supplies. Legislative action to establish a state drinking water standard for perchlorate was passed in 1998 (CA Senate Bill 1033) but was vetoed by the governor. In January 1999, CA DHS adopted a regulation identifying perchlorate as an unregulated chemical for which monitoring is required. Certain drinking water systems will need to sample their drinking water sources for perchlorate.

In August 1997, the Nevada Division of Environmental Protection (NDEP) selected 18 ppb as the recommended action level for cleanup pending a more current risk assessment.

In March 1999, the Arizona Department of Health Services set a provisional Health Based Guidance Level of 31 ppb.

Texas has decided to use 32 ppb as an "interim" action level for perchlorate in drinking water.

No other state is known to have adopted action levels for perchlorate.

Figure 2: States With Identified Perchlorate Manufacturers or Users

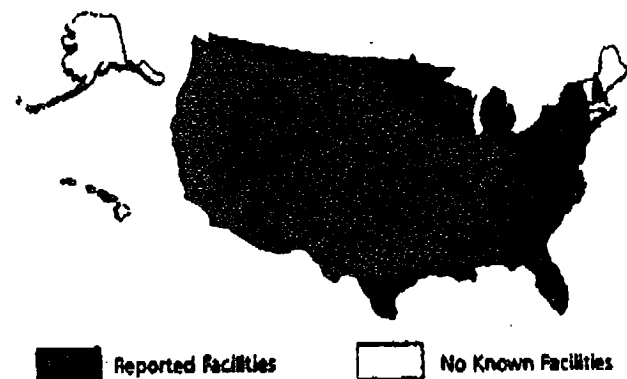
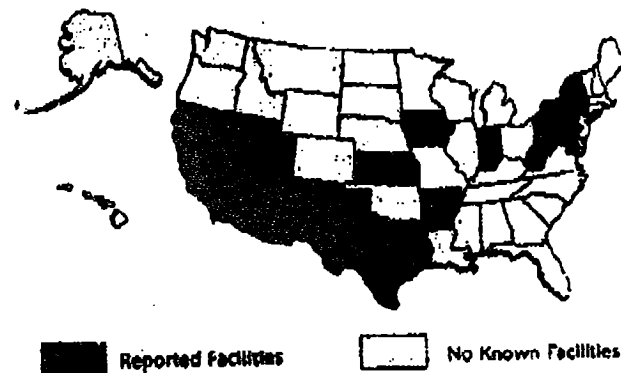


Figure 3: States with Environmental Releases of Perchlorate



Colorado River

Perchlorate concentrations at the Metropolitan Water District's (MWD) water intake at Lake Havasu, CA have averaged 6 ppb for the last two years (range 5 to 9 ppb). Arizona's Central Arizona Project (CAP) also takes water from Lake Havasu. Perchlorate concentrations in Lake Mead, at the water intake for the city of Las Vegas, have varied from less than 4 ppb to 16 ppb. The EPA is working with the NDEP to clean up the source of the perchlorate in Henderson, NV, and is monitoring the river for perchlorate in collaboration with the U.S. Geological Survey, adjacent states and other agencies.

Groundwater

In California, 140 public water supply wells have reported perchlorate above 4 ppb. Water suppliers have shut down wells or blended water so that they are providing water which does not exceed the California action level of 18ppb. In EPA Region 9, we know of 19 separate releases of perchlorate to the environment affecting 3 states, 11 tribes and perhaps Mexico.

Treatment Technologies

In the two years since perchlorate was discovered in water supplies in California, Nevada, and Arizona, much progress has been made in developing treatment methods capable of removing perchlorate from water. Most of the attention has been directed at two technologies: biological treatment and ion exchange.

Biological Treatment

In the biological treatment process, microbes destroy perchlorate by converting the perchlorate ion to oxygen and chloride. In most cases,

nutrients must be added to sustain the microbes. A six month pilot-scale study of a biological process has been completed for the San Gabriel Valley Superfund Sites, demonstrating the reduction of perchlorate from approximately 75 ppb to below detectable levels. The same process is being used in a recently-constructed full-scale system at the Aerojet Superfund Site in Northern California, where perchlorate concentrations exceed 1,000 ppb. A biological process has also been used to treat perchlorate-contaminated wastewaters resulting from the manufacture and maintenance of rocket motors, where perchlorate concentrations may exceed 500,000 ppb.

Biological treatment methods are believed to be capable of producing potable water, but additional testing must be completed to determine whether a biological process can reliably and cost-effectively produce drinking water quality water. The necessary tests are planned for later this year, when a 500 gallon per minute biological treatment system designed to produce potable water for use in the San Gabriel Valley should be in operation. The treatment system is expected to include a biological reactor, followed by a biologically-active multimedia filter and granular activated carbon (GAC) polishing treatment. Biological treatment methods are new to many water utilities, but biologically-active filters have been used in drinking water treatment for decades to help remove particles and biodegradable organic matter. The treatment train to be used in the San Gabriel Valley project will rely on biological treatment for primary removal of perchlorate, and is expected to include GAC as a backup process capable of limited perchlorate removal.

Ion Exchange

The second of the two perchlorate-removal technologies receiving the most attention is ion exchange, in which the perchlorate ion is replaced by chloride, a chemically similar but nontoxic ion. Ion exchange processes have been used in homes and businesses for water softening for decades. Bench- and pilot-scale studies have demonstrated that ion exchange systems can reliably reduce perchlorate concentrations in San Gabriel Valley groundwater from approximately 75 ppb to below detectable levels. The studies have also provided valuable information on resin selection and regeneration, brine production, and cost that will guide the design and operation of full scale systems. By Summer 1999, a 2500 gallon per minute ion exchange system is expected to be online producing potable water for use in the San Gabriel Valley.

The principal disadvantage of ion exchange systems is that they produce a concentrated brine that requires disposal and/or further treatment. Research is underway to try to identify methods of reducing the volume of perchlorate-contaminated brines to reduce the high cost of disposal.

Two other technologies have also been demonstrated capable of removing perchlorate, but probably at higher cost. Reverse osmosis and nanofiltration were tested by researchers at the Metropolitan Water District of Southern California and shown to be effective in removing perchlorate, but they are likely to be much more expensive to operate than ion exchange processes. Liquid phase GAC also removes perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on GAC for perchlorate removal very expensive. Perchlorate cannot be removed from water by conventional filtration, sedimentation, or air stripping technologies.

In the next two years, the results of perchlorate treatment research funded by a \$2 million Federal appropriation to the American Water Works Association Research Foundation (AWWARF) will be available. AWWARF is funding studies into biological treatment methods, ion exchange, reverse osmosis, nanofiltration, and other processes. The

results of the AWWARF research should allow more efficient design and operation of ion exchange and biological treatment processes, and may identify other technologies capable of more cost-effectively removing perchlorate from water.

The "best" technology for removal of perchlorate will probably vary from site to site. By the end of 1999, it is likely that full scale ion exchange and biological treatment systems will have been constructed and begun operation, providing cost and performance data that will be available to help others choose the best technology for their site. The results from recent and ongoing studies will be of use to water utilities in need of reliable, easy-to-operate treatment methods that can reliably reduce perchlorate concentrations to low or non-detectable levels, and in the remediation of non-potable contaminated groundwaters.

Analytical Issues

Ion chromatography (IC) is the state-of-the-art analytical method for the measurement of perchlorate in water. Federal, state, and private laboratories collaborated to study the existing IC method and its variations. The study design evaluated the within laboratory precision (repeatability), between laboratory precision (reproducibility), method accuracy (bias), detection limit, and sensitivity of the method. The results of this collaborative study will help focus future research and method development.

An increasing number of commercial and government laboratories are capable of low level perchlorate analysis, leading to further discoveries of perchlorate contamination. Development of a formal published method documenting the reproducibility and limitations of the technique is expected to facilitate the acceptance of perchlorate testing at low concentrations by laboratories across the country. The need for a reporting limit of 4 ppb taxes the sensitivity and reproducibility of the current IC method. Work is also being planned to develop different analytical techniques to confirm the results of the IC method.

Interagency Perchlorate Steering Committee (IPSC)

The Interagency Perchlorate Steering Committee (IPSC) was formed in January 1998 and now has representatives from 19 different government agencies. Its purpose is to ensure an integrated approach to addressing perchlorate issues and to inform and involve stakeholders about developments in the technical and regulatory arenas. Four EPA representatives serve on the Executive Committee of the IPSC and EPA representatives serve on all of the subcommittees of the IPSC (health effects/toxicity, ecological impacts/transport and transformation, occurrence, treatment technology, analytical, communications and outreach, and external peer review). The initial toxicological assessment effort for perchlorate was accomplished in an extraordinarily expedited time frame through the partnership of the IPSC membership.

As of May 1999, the following agencies are members of the IPSC: U.S. Environmental Protection Agency, Department of Defense, Agency for Toxic Substances and Disease Registry, National Institute for Environmental Health Sciences, National Aeronautics & Space Administration, Bureau of Indian Affairs, Arizona Department of Environmental Quality, Arizona Department of Health Services, California Department of Health Services, National Park Service, Nevada Division of Environmental Protection, Texas Natural Resource Conservation Commission, Utah Department of Environmental Quality, Utah Department of Health Laboratories, Cocopah Tribe, Colorado River Indian Tribes, Fort Mojave Tribe, Chemehuevi Tribe, Quechan Tribe.

U.S. Environmental Protection Agency World Wide Web Sites

EPA Perchlorate Web site:
<http://www.epa.gov/ogwdw/ccf/perchlor/perchlo.html>

NCEA External Review Document:
<http://www.epa.gov/ncea/perch.htm>

Other Region 9 World Wide Web Sites

California Department of Health Services:
<http://www.dhs.cahwnet.gov/ps/ddwern/chemicals/perchl/perchlindex.htm>

Arizona Department of Environmental Quality:
<http://www.adeq.state.az.us>

Nevada Division of Environmental Protection:
<http://www.state.nv.us/ndep/>

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Government Relations
Tel: 415-744-1588

A number of documents related to perchlorate are indexed and available from the EPA's Region 9 Superfund Records Center, located at 95 Hawthorne Street in San Francisco, CA. The Superfund Records Center is open from 8:00 a.m. to 5:00 p.m., Monday through Friday. For more information on document availability, contact the Superfund Records Center at 415-536-2000 or Catherine McCracken at 415-744-2182 or 800-231-3075 (toll-free from AZ, CA, HI, NV, and the U.S. Territories only).

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Attn: Catherine McCracken

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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138

Carson City, Nevada 89706-0851

June 25, 1999

MEMORANDUM

To: Allen Biaggi, Administrator

Handwritten signature of Allen Biaggi in black ink.

Through: Jim Williams, Bureau Chief

Handwritten initials "JBU" in black ink.

From: Darrell W. Rasner

Handwritten signature of Darrell W. Rasner in black ink.

Subject: KERR MCGEE POND ANALYSIS - 11 ACRE POND

The 11 acre pond at Kerr McGee was analyzed for volume and fill rate under various flow scenarios. Precipitation and evaporation rates in the Las Vegas Valley were also taken into account (see spreadsheets). The following scenario's were reviewed:

Scenario # 1 - 60 gpm (chromium treatment flow)
[60 gpm]

Scenario # 2 - 60 gpm (chromium treatment flow) +
[420 gpm] 360 gpm (perchlorate seep)

Scenario # 3 - 60 gpm (chromium treatment flow) +
[570 gpm] 360 gpm (perchlorate seep) +
 150 gpm (Pitman lateral well)

Scenario # 4 - 60 gpm (chromium treatment flow) +
[210 gpm] 150 gpm (Pitman lateral well)

Pond volume was calculated by scaling the drawing in the permit file. The base is approximately 11 acres and the top is about 15 acres @ 20 ft. above the base. It is estimated the volume is around 70 million gallons @ 17 ft. deep (assumed operating depth, allowing 3 ft. of freeboard). There was a discrepancy in evaporation values used by Kerr McGee and the one staff was given by Dr. David Davit, University Agricultural Extension Office. This accounts in part, for the difference in fill rates.

Kerr McGee

	Scenario # 1	Scenario # 2	Scenario # 3	Scenario # 4
GPM	60	420	570	210
GPD	86,400	604,800	820,800	302,400
Million gal/yr	31,536,000	220,752,000	299,592,000	110,376,000
Time to 17 ft.	192 months	4.5 months	3 months	11 months
Time to 20 ft.	*	5.5 months	3.7 months	12.5 months

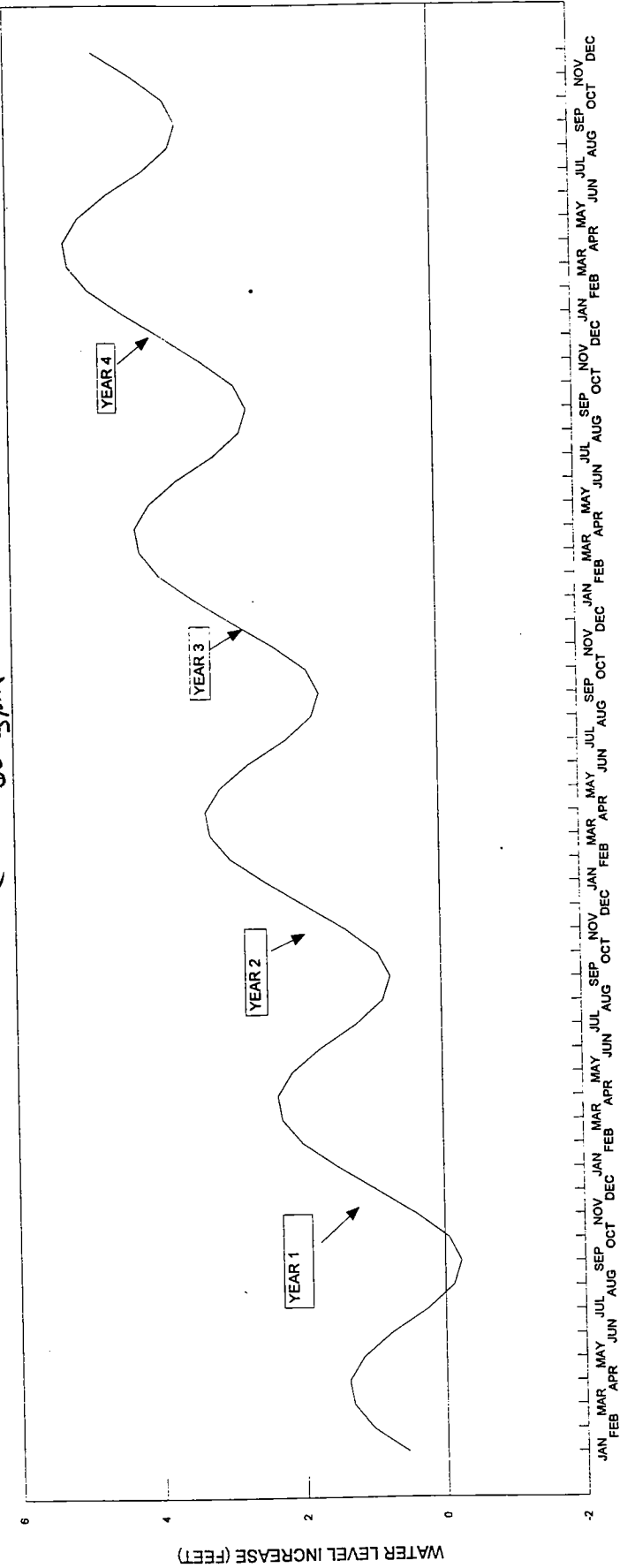
* Not determined

Enclosures:

- Memo to D. Rasner from J. Maez, June 24, 1999
- Scenario 1 - Graph & spreadsheet
- Scenario 2 - Graph & spreadsheet
- Scenario 3 - Graph & spreadsheet
- Scenario 4 - Graph & spreadsheet
- Drawing of pond (n.t.s.)
- Kerr McGee perc pond calcs - Time to fill pond, months
- Draft volume calculation for 11 acre pond
- Draft calculation sheet

KERR MCGEE POND DEPTH
SCENARIO 1- 60 GPM INFLOW

(Chromium Treatment)
60 spm



Kerr McGee Pond 1999-JUNE		PPT (INCHES)		EVAP (INCHES)		INFLOW (GPD)		VOLUME PPT (MGAL)		VOLUME EVAP (MGAL)		VOLUME CHANGE (MGAL)		DEPTH CHANGE IN POND (FEET)		YEAR 2 DEPTH		YEAR 3 DEPTH		YEAR 4 DEPTH		YEAR 5 DEPTH	
FLOW (gpd):		86400																					
Pond Volume (mgal)		74.851																					
MONTH																							
JAN		0.5	1.1	86400.0	0.215	0.4	0.4	0.556	1.512	2.468	3.423	4.379											
FEB		0.5	2.1	86400.0	0.215	0.6	0.6	1.047	2.002	2.958	3.913	4.869											
MAR		0.5	5.1	86400.0	0.215	1.6	1.6	1.324	2.279	3.235	4.190	5.146											
APR		0.2	7.7	86400.0	0.090	2.4	2.4	1.384	2.340	3.295	4.251	5.207											
MAY		0.2	11.5	86400.0	0.073	3.6	3.6	1.177	2.132	3.088	4.044	4.999											
JUN		0.1	14.1	86400.0	0.034	4.4	4.4	0.778	1.734	2.689	3.645	4.600											
JUL		0.4	16.3	86400.0	0.185	5.1	5.1	0.256	1.211	2.167	3.123	4.078											
AUG		0.5	14.3	86400.0	0.198	4.5	4.5	-0.121	0.834	1.790	2.746	3.701											
SEP		0.3	10.3	86400.0	0.146	3.2	3.2	-0.231	0.725	1.680	2.636	3.592											
OCT		0.2	6.2	86400.0	0.099	1.9	1.9	-0.056	0.899	1.855	2.810	3.766											
NOV		0.4	2.3	86400.0	0.159	0.7	0.7	0.406	1.362	2.317	3.273	4.228											
DEC		0.4	1.1	86400.0	0.164	0.3	0.3	0.956	1.911	2.867	3.822	4.778											
		4.2	92.0		1.8	28.7	4.2																
						Each Year																	

Notes: Precipitation data (ppt) from DRI information gathered from 68 years

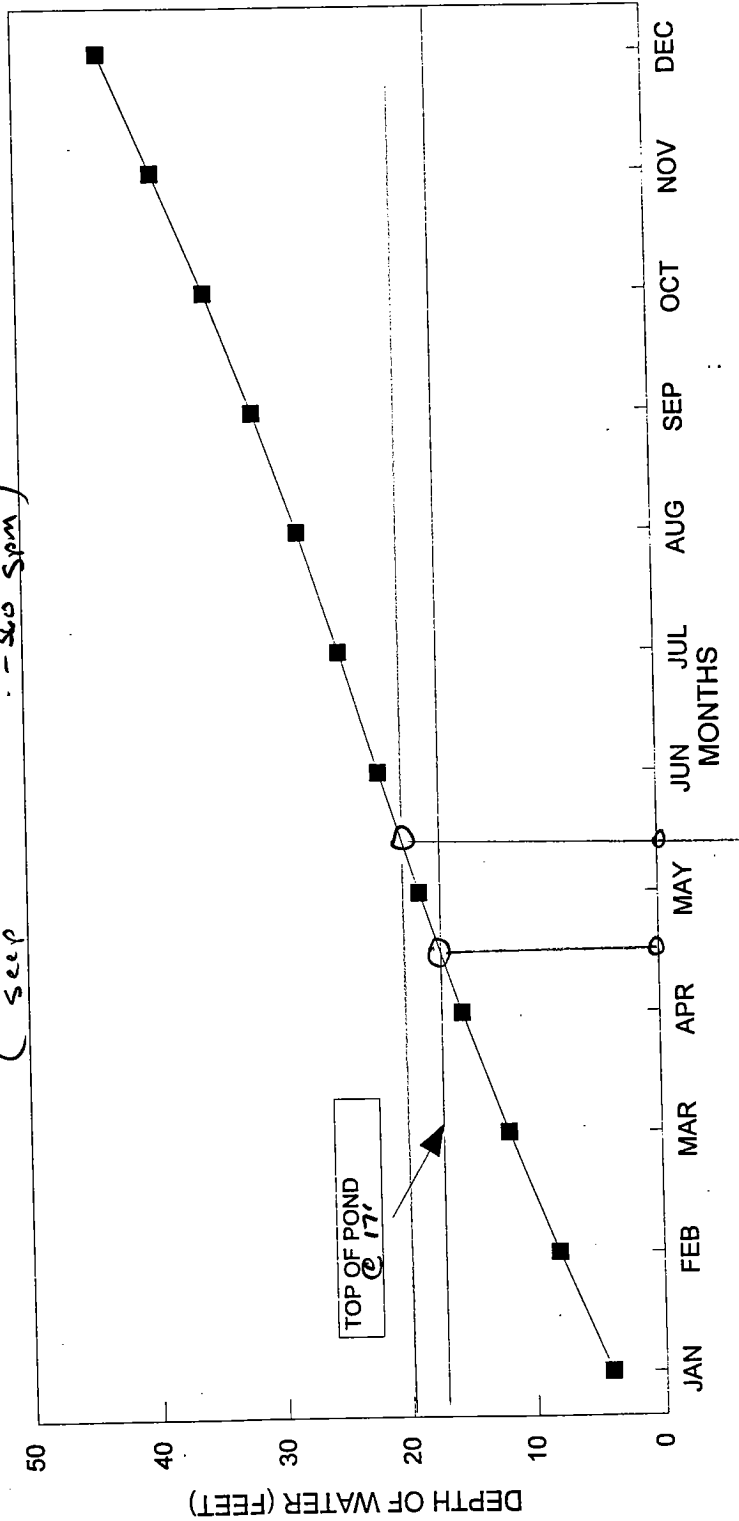
Evaporation data (EVAP) from proportioning of regions ET rates with the annual lake evaporation rate provided from Dr. Devitt of UNR

Assumptions: Surface area for evap is at mid-depth of the pond
Surface area for ppt is at top operating level of pond

KERR MCGEE POND DEPTH

SCENARIO 2 - FLOW OF 420 GPM

(Chromium treatment - 60 Spm
Seep - 360 Spm)

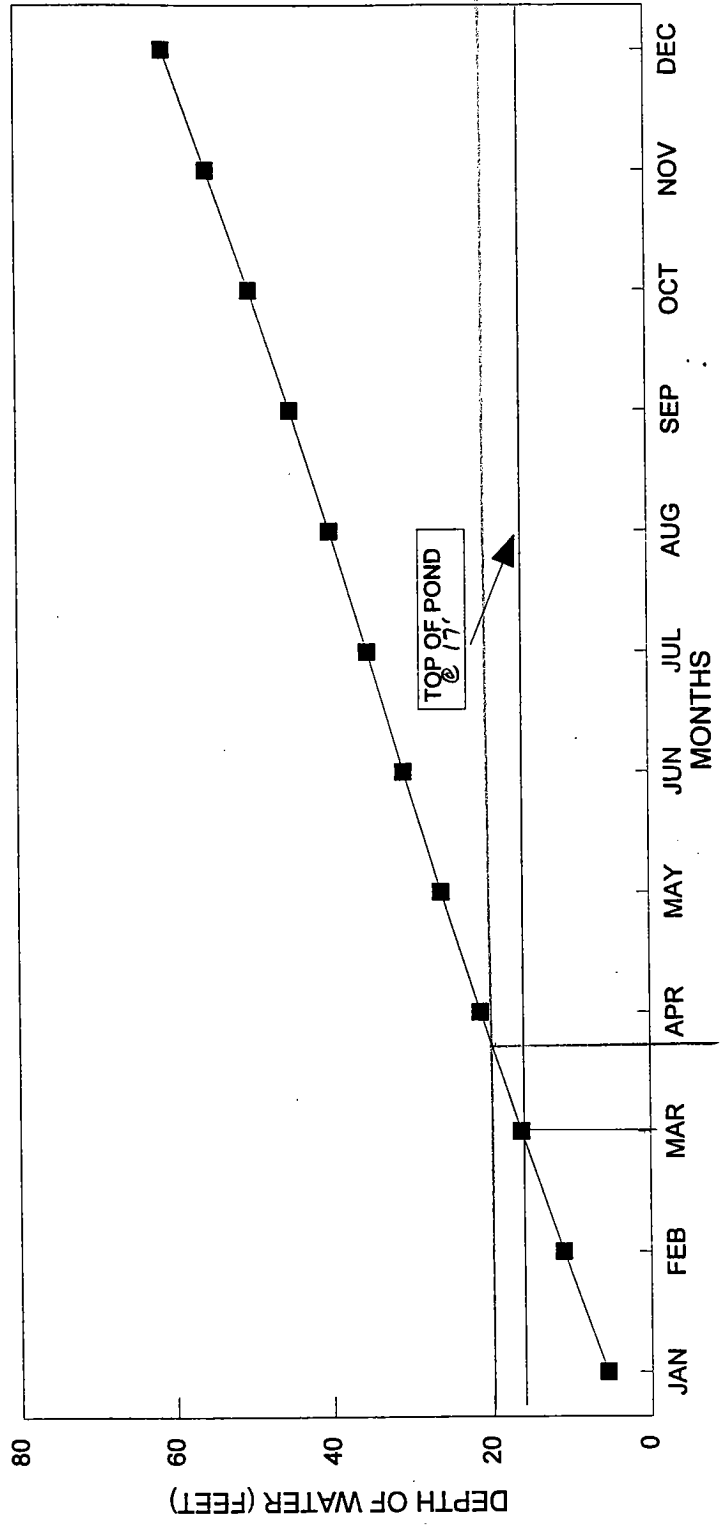


Totally full

3.5 mos.

KERR MCGEE POND DEPTH
 SCENARIO 3 - 570 GPM

Chromium treatment - 60 Spm + Seep - 360 Spm + Pitman well - 150 Spm



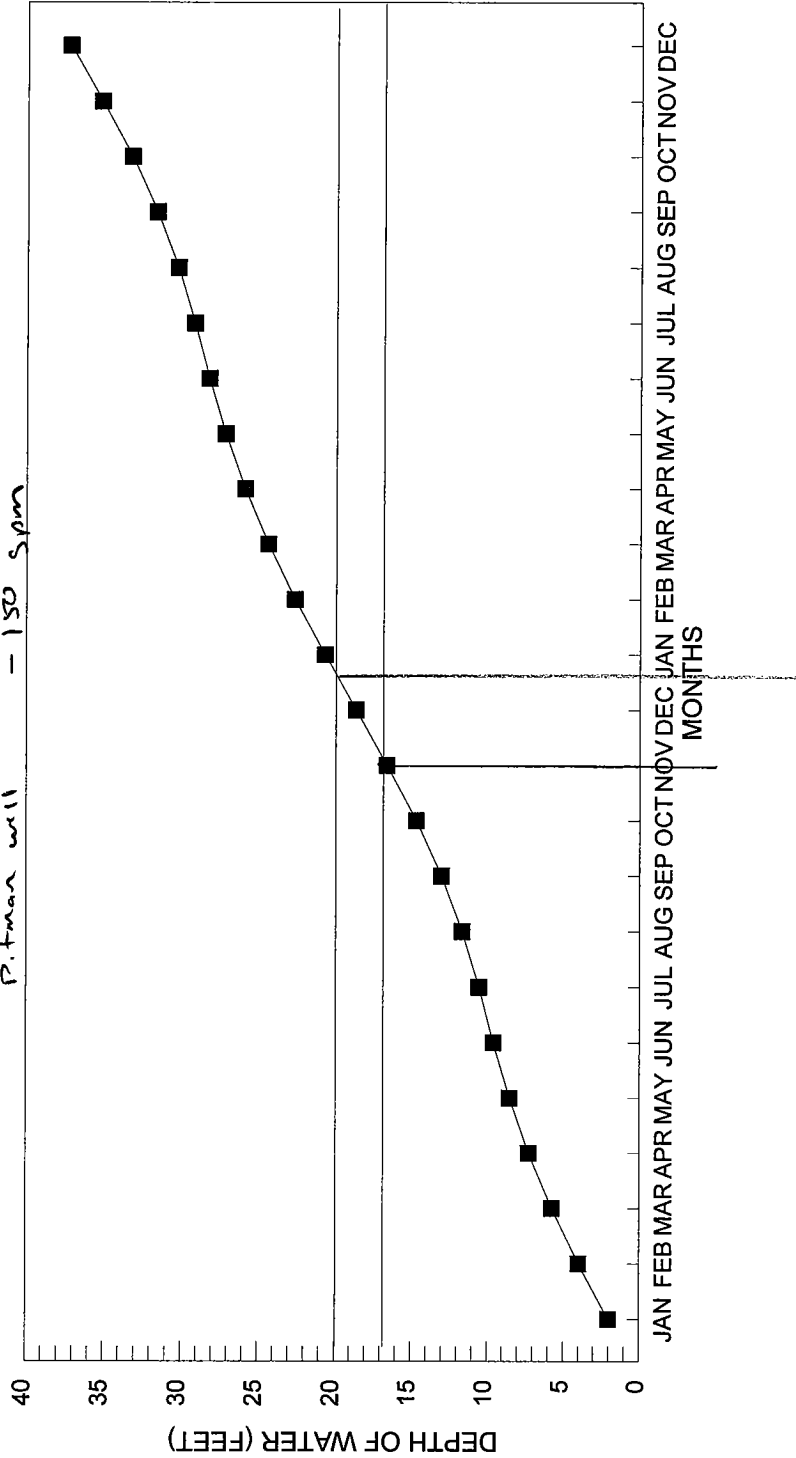
Daily High

2.0 mds

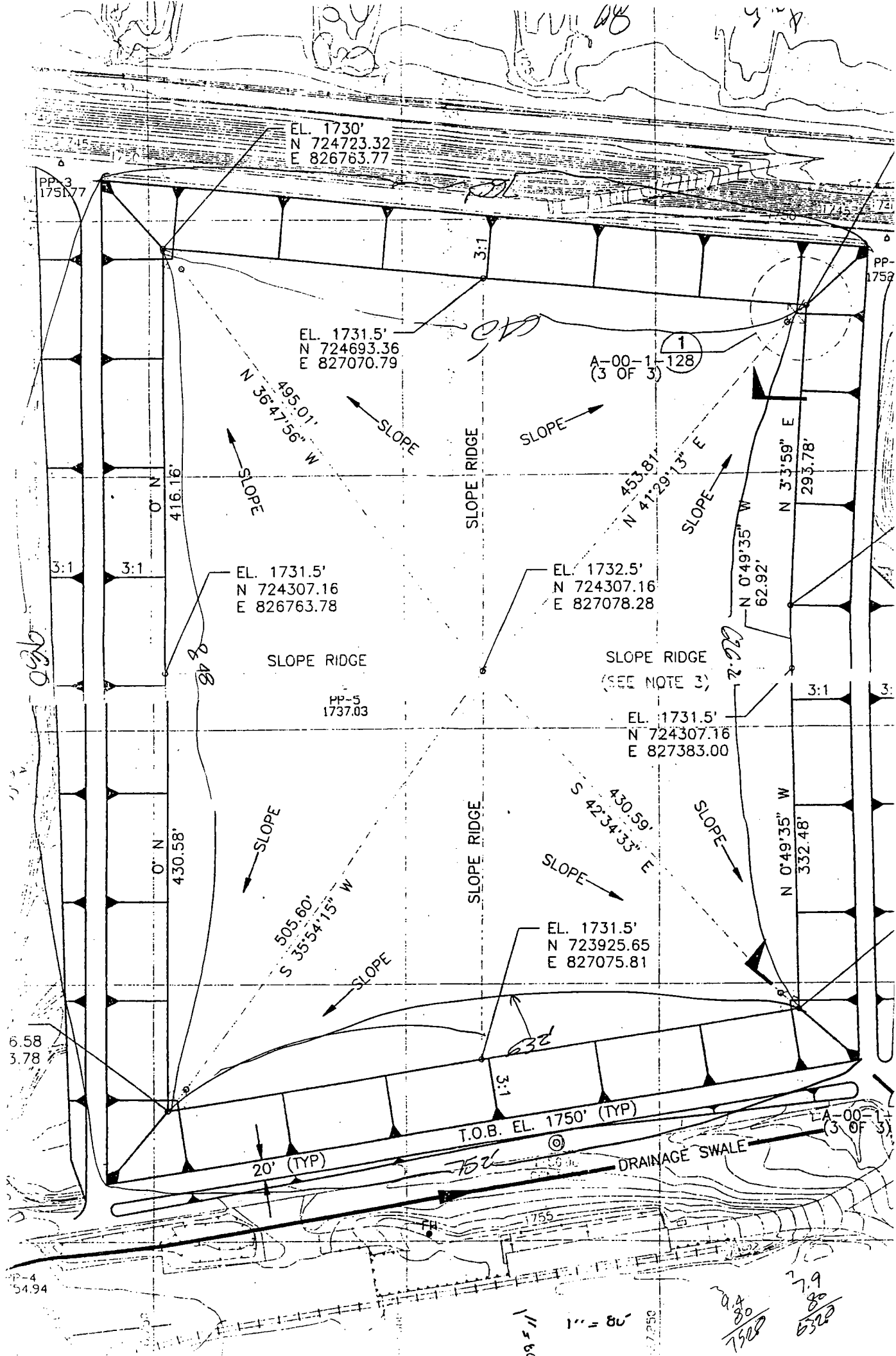
KERR MCGEE POND DEPTH

SCENARIO 4 - FLOW OF 210 GPM

Chromium Treatment - 60 Spm
Pitman well - 150 Spm



MONTH	PPT (INCHES)	EVAP (INCHES)	INFLOW (GPD)	VOLUME PPT (MGAL)	VOLUME EVAP (MGAL)	VOLUME CHANGE (MGAL)	DEPTH CHANGE IN POND (FEET)	YEAR 2 DEPTH	YEAR 3 DEPTH	YEAR 4 DEPTH	YEAR 5 DEPTH
JAN	0.5	1.1	302400.0	0.215	0.4	8.9	2.028	20,644	39,261	57,877	76,493
FEB	0.5	2.1	302400.0	0.215	0.6	8.6	3,990	22,606	41,223	59,839	78,455
MAR	0.5	5.1	302400.0	0.215	1.6	7.7	5,739	24,355	42,971	61,588	80,204
APR	0.2	7.7	302400.0	0.090	2.4	6.7	7,271	25,887	44,504	63,120	81,736
MAY	0.2	11.5	302400.0	0.073	3.6	5.6	8,536	27,152	45,768	64,384	83,001
JUN	0.1	14.1	302400.0	0.034	4.4	4.7	9,608	28,225	46,841	65,457	84,073
JUL	0.4	16.3	302400.0	0.185	5.1	4.2	10,558	29,174	47,790	66,407	85,023
AUG	0.5	14.3	302400.0	0.198	4.5	4.8	11,652	30,269	48,885	67,501	86,118
SEP	0.3	10.3	302400.0	0.146	3.2	6.0	13,015	31,631	50,247	68,864	87,480
OCT	0.2	6.2	302400.0	0.099	1.9	7.2	14,661	33,277	51,893	70,510	89,126
NOV	0.4	2.3	302400.0	0.159	0.7	8.5	16,595	35,211	53,828	72,444	91,060
DEC	0.4	1.1	302400.0	0.164	0.3	8.9	18,616	37,233	55,849	74,465	93,081
	4.2	92.0		1.8	28.7	82.0					
					Each Year						
Notes: Precipitation data (ppt) from DRI information gathered from 68 years											
Evaporation data (EVAP) from proportioning of regions ET rates with the annual lake evaporation rate provided from Dr. Devitt of UNR											
Assumptions: Surface area for evap is at mid-depth of the pond											
Surface area for ppt is at top operating level of pond											



EL. 1730'
 N 724723.32
 E 826763.77

PP-3
 1751.77

EL. 1731.5'
 N 724693.36
 E 827070.79

A-00-1
 (3 OF 3) 128

495.01'
 N 36°47'56" W

SLOPE

SLOPE RIDGE

SLOPE

453.81'
 N 47°29'13" E

SLOPE

N 3°3'59" E
 293.78'

3:1

3:1

EL. 1731.5'
 N 724307.16
 E 826763.78

EL. 1732.5'
 N 724307.16
 E 827078.28

N 0°49'35" W
 62.92'

SLOPE RIDGE

SLOPE RIDGE
 (SEE NOTE 3)

PP-5
 1737.03

EL. 1731.5'
 N 724307.16
 E 827383.00

3:1

SLOPE

SLOPE RIDGE

SLOPE

SLOPE

430.59'
 S 42°34'33" E

N 0°49'35" W
 332.48'

505.60'
 S 35°54'15" W

SLOPE

EL. 1731.5'
 N 723925.65
 E 827075.81

6.58
 3.78

632

T.O.B. EL. 1750' (TYP)

A-00-1
 (3 OF 3)

20' (TYP)

DRAINAGE SWALE

PP-4
 174.94

1" = 80'

7.9
 80
 6320

PROVIDED BY KEAR MCGEE

Perc Pond Calcs

ITEM 4

Time to fill pond, months

Flow	50 gpm
Evaporation	2.5 gpm/acre
Rainfall	4 Average annual, inches per year

2.5 spm/ac x 11 ac = 27.5 spm
 27.5 spm x 60 min/hr x 24 hr x 365 days/yr = 14,454,000 gal/yr

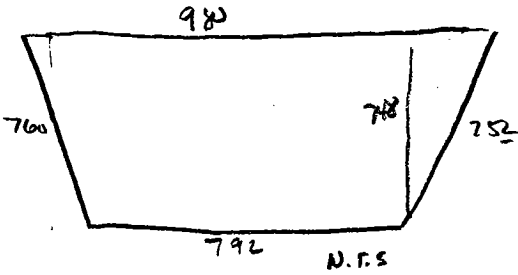
ACRES	DEPTH	10		12		14		16		18		20		22		24		26		28		30	
		Rainfall gpm	Net gpm	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill	Months to fill
1		0.21	47.71	1.56	1.87	2.18	2.49	2.81	3.12	3.43	3.74	4.05	4.37	4.68	5.00	5.31	5.62	5.93	6.24	6.55	6.86	7.17	7.48
1.5		0.31	46.56	2.40	2.88	3.36	3.83	4.31	4.79	5.27	5.75	6.23	6.71	7.19	7.67	8.15	8.63	9.11	9.59	10.07	10.55	11.03	11.51
2		0.41	45.41	3.28	3.93	4.59	5.24	5.90	6.55	7.21	7.86	8.52	9.17	9.83	10.48	11.13	11.78	12.43	13.08	13.73	14.38	15.03	15.68
2.5		0.52	44.27	4.20	5.04	5.88	6.72	7.56	8.40	9.24	10.08	10.92	11.76	12.60	13.44	14.28	15.12	15.96	16.80	17.64	18.48	19.32	20.16
3		0.62	43.12	5.18	6.21	7.25	8.28	9.32	10.35	11.39	12.42	13.46	14.49	15.53	16.56	17.59	18.62	19.65	20.68	21.71	22.74	23.77	24.80
3.5		0.72	41.97	6.20	7.44	8.68	9.93	11.17	12.41	13.65	14.89	16.13	17.37	18.61	19.85	21.09	22.33	23.57	24.81	26.05	27.29	28.53	29.77
4		0.83	40.83	7.29	8.75	10.20	11.66	13.12	14.58	16.03	17.49	18.95	20.41	21.87	23.33	24.79	26.25	27.71	29.17	30.63	32.09	33.55	35.01
4.5		0.93	39.68	8.44	10.12	11.81	13.50	15.19	16.87	18.56	20.25	21.93	23.62	25.31	27.00	28.69	30.38	32.07	33.76	35.45	37.14	38.83	40.52
5		1.03	38.53	9.65	11.58	13.51	15.44	17.37	19.31	21.24	23.17	25.10	27.03	28.96	30.89	32.82	34.75	36.68	38.61	40.54	42.47	44.40	46.33
5.5		1.14	37.39	10.94	13.13	15.32	17.51	19.70	21.89	24.08	26.26	28.45	30.64	32.83	35.02	37.21	39.40	41.59	43.78	45.97	48.16	50.35	52.54
6		1.24	36.24	12.32	14.78	17.24	19.71	22.17	24.63	27.10	29.56	32.02	34.49	36.95	39.41	41.88	44.34	46.81	49.27	51.74	54.20	56.67	59.13
6.5		1.34	35.09	13.78	16.53	19.29	22.05	24.80	27.56	30.31	33.07	35.82	38.58	41.34	44.09	46.85	49.60	52.36	55.11	57.87	60.62	63.38	66.13
7		1.45	33.95	15.34	18.41	21.48	24.54	27.61	30.68	33.75	36.82	39.88	42.95	46.02	49.09	52.16	55.23	58.30	61.37	64.44	67.51	70.58	73.65
7.5		1.55	32.80	17.01	20.41	23.81	27.22	30.62	34.02	37.42	40.82	44.23	47.63	51.03	54.43	57.83	61.23	64.63	68.03	71.43	74.83	78.23	81.63
8		1.65	31.65	18.80	22.56	26.32	30.08	33.84	37.60	41.36	45.12	48.88	52.64	56.40	60.16	63.92	67.68	71.44	75.20	78.96	82.72	86.48	90.24
8.5		1.76	30.51	20.73	24.87	29.02	33.16	37.31	41.45	45.60	49.75	53.89	58.04	62.18	66.33	70.47	74.62	78.76	82.91	87.05	91.20	95.34	99.49
9		1.86	29.36	22.80	27.36	31.93	36.49	41.05	45.61	50.17	54.73	59.29	63.85	68.41	72.97	77.53	82.09	86.65	91.21	95.77	100.33	104.89	109.45
9.5		1.96	28.21	25.05	30.06	35.07	40.08	45.09	50.10	55.11	60.12	65.13	70.14	75.15	80.16	85.17	90.18	95.19	100.20	105.21	110.22	115.23	120.24
10		2.07	27.07	27.48	32.98	38.48	43.97	49.47	54.97	60.47	65.96	71.46	76.96	82.45	87.95	93.45	98.95	104.45	109.95	115.45	120.95	126.45	131.95
10.5		2.17	25.92	30.14	36.16	42.19	48.22	54.24	60.27	66.30	72.32	78.35	84.38	90.41	96.44	102.47	108.50	114.53	120.56	126.59	132.62	138.65	144.68
11		2.27	24.77	33.03	39.64	46.24	52.85	59.46	66.06	72.67	79.28	85.88	92.49	99.09	105.70	112.30	118.91	125.51	132.12	138.73	145.33	151.94	158.54
11.5		2.38	23.63	36.21	43.45	50.69	57.93	65.18	72.42	79.66	86.90	94.14	101.39	108.63	115.87	123.11	130.35	137.59	144.83	152.07	159.31	166.55	173.79
12		2.48	22.48	39.71	47.65	55.59	63.54	71.48	79.42	87.36	95.31	103.25	111.19	119.13	127.07	135.01	142.95	150.89	158.83	166.77	174.71	182.65	190.59

81-ZHJ L-00085

ENGINEERING
 CONSULTANTS
 INC.

RETENTION BASIN - 980' x 760' x 792' x 752' (TOP)
 848' x 640' x 626' x 632' (BOTTOM)

TOP



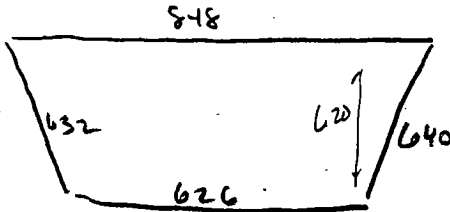
$$A = \frac{h(a+b)}{2} =$$

$$A = \frac{748(980 + 792)}{2} = \boxed{662,728 \text{ FT}^2}$$

Top of pond

→ 15.2 AC

Bottom



Bottom

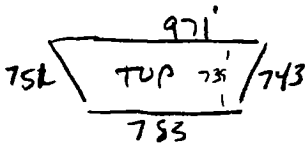
$$A = \frac{620(848 + 626)}{2} = \boxed{456,940 \text{ FT}^2}$$

→ 10.5 AC

$$\text{Volume} = \frac{d(A_1 + A_2)}{2} \times 7.48 = \boxed{83,751,166 \text{ Million gallons}}$$

Full!

3' freeboard



3' down

$$A = \frac{(739)(971 + 783)}{2} = \boxed{648,103 \text{ FT}^2}$$

$$(17') \frac{648,103 + 456,940}{2} \times 7.48 = \boxed{70,258,634 \text{ M}}$$

POND capacity @ 17ft is \approx 70 MG



11 ac ponds (base) $\approx 470,000 \text{ FT}^2$
 20 FT MAX depth - 3' freeboard (17' operating depth)

@ 17' deep - Volume \approx 70 MG

EVAP RATE: 92" yr (7.67') per Dr. D. DAVI UNR Extension

PRECIP RATE: 4" yr (0.34') per Desert Research Institute

$$Q_1 = 60 \text{ gpm} \rightarrow 86,400 \text{ gpd} \rightarrow (31,536,000 \text{ gal/yr})$$

$$Q_2 = 360 \text{ gpm} \rightarrow 518,400 \text{ gpd} \rightarrow (189,216,000 \text{ gal/yr})$$

$$Q_3 = 150 \text{ gpm} \rightarrow 216,000 \text{ gpd} \rightarrow (78,840,000 \text{ gal/yr})$$

$$\text{EVAP} - \text{PRECIP} = 7.67' - 0.34' = \underline{7.33 \text{ FT/yr}}$$

$$7.33 \text{ FT} \times \underset{\substack{\uparrow \\ \text{CONSERVATIVE VALUE}}}{\approx 500,000 \text{ FT}^2} \times 7.48 \text{ gal/FT}^3 =$$

$$\boxed{27,414,200 \text{ gal}} \\ \text{that will evaporate} \\ \text{per year}$$

As depth increases, evaporation volume will also increase due to increased surface area:

$$\text{@ 17', surface area is } \approx 650,000 \text{ FT}^2$$

$$\therefore 7.33 \text{ FT} \times \approx 650,000 \text{ FT}^2 \times 7.48 = \boxed{35,638,460 \text{ gal}}$$

Worst case - assuming no evap losses:

$$Q_1 - \frac{70,000,000 \text{ gal}}{86,400 \text{ gal}} = \underline{810 \text{ days}} = \boxed{2.21 \text{ yr}}$$

$$Q_1 + Q_2 - \frac{70,000,000 \text{ gal}}{604,800 \text{ gal}} = \underline{116 \text{ days}} = \boxed{0.317 \text{ yr}}$$

$$Q_1 + Q_2 + Q_3 - \frac{70,000,000 \text{ gal}}{820,800 \text{ gal}} = \underline{85 \text{ days}} = \boxed{0.23 \text{ yr}}$$

TRANSMIT CONFIRMATION REPORT

NO.	:	003
RECEIVER	:	1 4155 744 1796
TRANSMITTER	:	NW DIV EVN PROT
DATE	:	JUN 25 1999 1510
DURATION	:	0723
MODE	:	STD
PAGES	:	14
RESULT	:	OK



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 25, 1999

Mr. Douglas Zimmerman
 Chief, Bureau of Corrective Action
 Nevada Department of Environmental Protection
 333 W. Nye Lane
 Carson City, Nevada 89710

Doug
 Dear Mr. Zimmerman:

EPA appreciates this opportunity to provide comments on the Draft Consent Agreement prepared by the Nevada Department of Environmental Protection (NDEP) to be issued to the Kerr McGee Chemical Corporation. We strongly support formalization of an enforceable NDEP Order which would require Kerr McGee to capture and treat all of the surface discharges and ground water impacted by perchlorate as a result of Kerr McGee's past operations.

We would like to see NDEP's Consent Agreement reflect a more comprehensive approach to the remediation of perchlorate in Las Vegas Wash. In addition to the tasks specified at the Las Vegas Wash, Kerr McGee should immediately begin the pumping of ground water at the Pittman Lateral. Ground water could initially be trucked to the existing 11.5 acre evaporation pond while new pond capacity is developed, a pipeline is constructed, and/or treatment technologies are constructed and brought on line.

The level of detail in the Consent Agreement should be broadened to include specific tasks Kerr McGee needs to complete in order to begin interception of ground water and surface water at Las Vegas Wash, the Pittman Lateral, and to continue the interception of ground water already begun at the chrome treatment line. The Order should also contain provisions to continue the investigations near Las Vegas Wash to identify the remaining perchlorate flow pathways into the Wash, and eventually to intercept and treat these flow pathways.

Finally, a schedule or schedules of compliance should be included in the Consent Agreement for all future work. A realistic time line for the completion of specific tasks by Kerr McGee should be set forth in the Order.

Post-it® Fax Note	7671	Date	6/29/99	# of pages	7
To	Brenda	From	Doug		
Co./Dept.		Co.			
Phone #		Phone #			
Fax #	702 486-2863	Fax #			

EPA looks forward to continuing our close working relationship NDEP to bring the release of perchlorate from Kerr McGee under control within the shortest possible timeframe. If you have any questions, please call me at (415) 744-2051 or Mitch Kaplan at (415) 744-2063.

Sincerely,

Larry Bowerman

Larry Bowerman, Chief

RCRA Corrective Action Office

cc: Julie Anderson, EPA
Keith Takata, EPA
John Kemmerer, EPA
Kathy Moore, EPA
Kevin Mayer, EPA



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

RECEIVED
ENVIRONMENTAL
PROTECTION

JUN 10 99

June 7, 1999

Mr. Alan Biaggi, Administrator
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi:

Subject: Draft Perchlorate Interim Consent Agreement

Kerr-McGee Chemical LLC (Kerr-McGee) provides the attached draft Perchlorate Interim Consent Agreement for Nevada Division of Environmental Protection (NDEP) review and comment. This draft Agreement is intended to cover activities associated with perchlorate recovery close to the Las Vegas Wash. After discussion with Brenda Pohlmann, it was evident that a work schedule, including a capture completion date, could not be provided with this initial draft but will be provided as soon as possible. The two documents will ultimately be merged into one document describing the activities relating to the seep area.

Please feel free to contact me at (702) 651-2234, if you have any questions.
Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Attachment

cc: PSCorbett
ALDooley
WOGreen
J Reichenberger
JTSmith, Covington and Burling
Brenda Pohlmann, NDEP
Doug Zimmerman, NDEP

DRAFT
June 7, 1999

CONSENT AGREEMENT

This Consent Agreement is made and entered into this _____ day of June, 1999, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("Division") and Kerr-McGee Chemical LLC (the "Company"). The Company and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Division is designated as the state water pollution control agency for Nevada and is empowered to administer and enforce the Nevada Water Pollution Control Law, Nevada Revised Statutes ("NRS") §§ 445.131 to 445.354, inclusive;

WHEREAS, through sampling and analyses begun in 1997, the Division has detected the presence of perchlorate in ground and surface waters in the area of the Las Vegas Wash and in Lake Mead, and the federal and state authorities have not yet finalized a level of perchlorate in drinking water which will be adequately protective of human health. [Provisional acceptable risk levels range from 18 to 33 micrograms per liter.]

WHEREAS, the Company has since 1968 owned and operated a plant at Henderson, Nevada used to produce ammonium perchlorate, which same facility was previously owned by the United States Navy and others for the manufacture of perchlorate products, and intermediates;

WHEREAS, in Henderson, to the southwest of the Company's facility, ammonium perchlorate was manufactured for approximately 30 years by Pacific Engineering and Production Co. of Nevada ("PEPCON");

WHEREAS, sampling of groundwater at the Company's and PEPCON sites and in areas to the north and east of these facilities, approaching the Las Vegas Wash has indicated elevated

levels of perchlorate in groundwater which are presumptively associated with historical operations at the Company's and PEPCON's facilities;

WHEREAS, the Company has been cooperating with the Division in the further delineation of the groundwater plume of perchlorate and in the investigation of appropriate and feasible means to remediate this contamination, and the Company has already constructed an eleven acre, lined impoundment at this Henderson facility and through use of this impoundment is currently removing substantial quantities of perchlorate from groundwater each day;

WHEREAS, the Division has recently identified a groundwater seep north of the BMI lower ponds and adjacent to the Las Vegas Wash, believed to be located within the SE/4 of the SW/4 of the SW/4, Sec. 30, T21S, R63, Clark County, Nevada , and the Division believes that expeditious action to capture this seep should materially and substantially reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in the near term;

WHEREAS, the Company desires to continue to cooperate fully with the Division in addressing the potential problem of perchlorate contamination in the Henderson, Nevada area, while preserving its rights to seek contribution from third parties who are likely to share responsibility for perchlorate contamination, including the United States Navy and PEPCON; and

WHEREAS, the Company has committed to the Division that it will promptly implement interim measures to further characterize, capture and contain the seep identified in the Las Vegas Wash area, and the Company and Division have agreed that this Consent Agreement should govern the rights and responsibilities of the Parties with respect to this interim remedial effort.

NOW, THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, and intending to legally bound hereby, the Division and the Company agree as follows:

I. STATEMENT OF PURPOSE

In entering this Consent Agreement, the mutual objective of the Parties is to cooperate in the design and implementation of interim measures that will allow the prompt capture and containment of the aforesaid seep in the area of the Las Vegas Wash, including the securing of all property access, permits and other environmental approvals that may pertain to wetlands and species protection, and rights-of-way or other property interests that may prove necessary. The Parties intend that the work to be performed in accordance with this Agreement and accepted by the Division will be consistent with the National Contingency Plan, 40 CFR § 300.1 *et seq.*

II. PARTIES BOUND

1. The provisions of this Consent Agreement shall apply to and be binding upon the Division, and upon the Company, its successors and assigns.

2. Any change in ownership or corporate or partnership status of the Company and any conveyance of title, easement, or other real property interest in its Henderson, Nevada facility or a portion of the facility, shall in no way alter the Company's responsibilities under this Consent Agreement. In the event that the Company proposes to sell or transfer all or a portion of the facility, or any real property subject to this Consent Agreement, the Company shall, prior to such sale or transfer, provide written notice to such purchasers or transferee of the existence and terms of this Consent Agreement, and shall provide written notice to the Division concerning the sale or transfer not later than fifteen (15) days after such sale or transfer. The Company shall also obtain, and provide to the Division a copy of, a written undertaking from any purchaser in

connection with such sale or transfer that said purchaser will comply with the foregoing notice requirements in connection with any subsequent transfer of such real property.

3. The Company shall provide a copy of this Consent Agreement to all Contractors retained by it to conduct or monitor any portion of the work performed under this Consent Agreement not more than fourteen (14) days after either the Effective Date of this Consent Agreement or by the date on which such Contractor commences work relating to this Consent Agreement whichever is later. The Company shall use best efforts to cause such persons or entities to comply with the terms of this Consent Agreement.

4. The Company agrees to undertake all actions required by the terms and conditions of this Consent Agreement. The Company shall finance the work and shall reimburse the Division for oversight costs as provided in this Consent Decree.

5. The undersigned representative of each Party to this Consent Agreement certifies that he or she is fully authorized by the Party whom he or she represents to enter into the terms and conditions of this Consent Agreement and to execute and legally bind that Party to it.

III. WORK TO BE PERFORMED

All work to be performed pursuant to this Agreement shall be carried out in a manner consistent with the applicable federal and Nevada statutes and their implementing regulations.

Upon execution of this Agreement, the Company shall submit a Workplan detailing the measures it plans to implement to capture and control the groundwater seep identified in the Las Vegas Wash area. This plan shall contain a schedule for implementation of the necessary capture and control measures. After completion of the public participation requirements of Section IV and upon mutual agreement by the Parties on a Workplan and accompanying schedule, they shall become an enforceable obligation pursuant to this Agreement.

IV. PUBLIC PARTICIPATION

Any Workplan and schedule received by the Division shall be made available to the public in accordance with applicable law. Following the notice and comment period, the Division and the Company may mutually agree to revise the Workplan and schedule as necessary to address appropriately any issue regarding such document identified by the public during such comment period.

V. SAMPLING AND DATA AVAILABILITY

1. All final results of sampling, tests, modeling and other data (but not including raw data that has not been subject to QA/QC procedures) generated by the Company, or on the Company's behalf, pursuant to this Consent Agreement shall be submitted to the Division in any progress report required by this Consent Agreement. The Company shall make all raw data available to the Division for review on request, and shall submit such data to the Division on written request. The Division will provide to the Company validated data generated by the Division unless it is except from disclosure by any federal or state law or regulation.

2. The Company shall notify the Division in writing at least five (5) working days prior to conducting any sampling described in the Workplan required by this Consent Agreement. If the Company believes it must commence field activities without delay, the Company may seek emergency telephone authorization from the Division Project Coordinator or, if the Division Project coordinator is unavailable, his/her Bureau Chief, the Administrator, or the Deputy Administrator, to commence such activities immediately. At the Division's oral or written request, the Company shall provide or allow the Division or its authorized representative to take split or duplicate samples of all samples collected by or on behalf of the Company pursuant to this Consent Agreement.

VI. PROGRESS REPORT

Beginning with the first full month following the effective date of this Agreement, and throughout the effective period of this Consent Agreement, the Company shall provide the Division with bi-monthly progress reports. Each progress report shall be filed with the Division no later than fifteen (15) days after the end of the month for which the report provides information.

VII. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this Consent Agreement. If the Company fails to follow any of the requirement contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If the Company disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, the Company shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute which arises under or with respect to this Consent Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed thirty (30) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within thirty (30) days after the conclusion of the informal negotiation period, the

Company invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position the Company claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for the Company's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by the Company, and any matters which it considers necessary for the Administrator's determination. The Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for an oral presentation.

5. Within thirty (30) days following receipt of a Statement of Position, or by such later date within thirty (30) days after any oral presentation by the Company as the Administrator may deem appropriate to adequately address such oral presentation, the Administrator shall issue his/her decision, which shall be binding on the Company and unappealable unless, within twenty (20) days after receipt of the decision, the Company exercises its rights as stated in paragraph 6 of this Section. The Administrator's written decision shall include a response to the Company's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this Consent Agreement, and shall be considered the Division's final decision as provided in paragraph 6 of this Section.

6. As to any final Division decision, the Company may pursue the dispute before the State Environmental Commission ("SEC") as a "contested case" pursuant to NRS §§ 233B.010 *et seq.* and NAC §§ 445.988 – 445.995, and shall be entitled to both administrative and judicial review as provided therein.

VII. FORCE MAJEURE

1. The Company shall perform the requirements of this Consent Agreement within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. The Company shall have the burden of proving such a *force majeure*. A *force majeure*, for purposes of this Consent Agreement, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of the Company, or of any person or entity controlled by the Company, which delays or prevents the timely performance of any obligation under this Consent Agreement despite the Company's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes, lockouts, national emergencies, delays in obtaining access or use of property not owned or controlled by the Company despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from the Division or any other public agency that occur despite the Company's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the Consent Agreement. A *force majeure* does not include (i) increased costs of the work to be performed under the Consent Agreement, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of the Company's obligations under this Consent Agreement, whether or not caused by a *force majeure* event, the Company shall notify the Division orally within two (2) business days of when the Company first knew that the event might cause a delay. If the Company wishes to claim a *force majeure* event, then within ten (10) days thereafter, the Company shall provide to the Division a

written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Company's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of the Company, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. The Company shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude the Company from asserting any claim of *force majeure* for that event.

3. The Division shall notify the Company in writing of its *force majeure* determination within fifteen (15) days after receipt of the notice from the Company. If the Division determines that the delay has been or will be caused by circumstances constituting a *force majeure* event, the time for performance of the obligations under this Consent Agreement that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless the Company can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and the Company cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, or if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section VII of this Consent Agreement.

IX. REIMBURSEMENT OF OVERSIGHT COSTS

1. The Company shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement, following the effective date and for the effective period of this Consent Agreement.

2. The Division shall account for oversight costs associated with implementing this Consent Agreement and related work and shall submit to the Company copies of all invoices on a quarterly basis, commencing with the first full calendar quarter after the effective date of this Consent Agreement. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or cost details for administrative and vendor expenses (such as travel, training, equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by the Company of the invoices. The Company may dispute a particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of any such dispute, the Company shall pay in a timely fashion undisputed costs. With respect to the disputed cost, the Company may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section VII.

3. All payments due by the Company shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and the Company's name and address.

X. INDEMNIFICATION

The Company agrees to indemnify, defend, save and hold harmless the Division, its contractors, agents and employees from any and all claims or causes of action arising from or on account of acts or omissions of the Company or its officers, employees, agents or Contractors in carrying out the activities required by or otherwise pursuant to this Consent Agreement.

XI. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to the Company's failure to comply with any of the requirements of this Consent Agreement or of any requirement of federal or state laws, regulations, or permit conditions. Except as provided in Section XII (Other Claims; Covenant Not to Sue), this Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State. This Consent Agreement in no way relieves the Company of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by the Company pursuant to this Consent Agreement subject to Dispute Resolution under Section VII.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this Agreement, or (2) any applicable provision of state or federal law.

4. If the Division determines that activities in compliance or noncompliance with this Consent Agreement have caused a release of perchlorate that may present an imminent and

substantial hazard to human health, welfare, and/or the Environment, the Division may order the Company to stop further implementation of this Consent Agreement for such period of time as the Division determines may be needed to abate any such Release and/or to undertake any action which the Division determines is necessary to abate such Release.

5. This Consent Agreement is neither a permit nor a modification of a permit. The Parties acknowledge and agree that the Division's approval of any Workplan hereunder does not constitute a warranty or representation that the Workplan will achieve the required or appropriate investigatory or performance standards.

6. Notwithstanding any other provision of this Consent Agreement and except as provided in Section VII (Dispute Resolution), no action or decision by the Division pursuant to this Consent Agreement including, without limitation, decisions by the Administrator, shall constitute final agency action giving rise to any right of judicial review prior to the Division's initiation of a judicial action to enforce this Consent Agreement, including an action to collect penalties or an action to compel the Company's compliance with the terms and conditions of this Consent Agreement.

7. The Company reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted to the Site and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this Agreement.

8. In any subsequent administrative or judicial proceeding initiated by the State for injunctive or other appropriate relief relating to the Site, the Company shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, claim-splitting, or other

defenses based upon any contention that the claims raised by the State of Nevada in the subsequent proceeding were or should have been raised in this Consent Agreement.

9. Nothing in this Consent Agreement shall be construed as an admission of liability by the Company.

XII. OTHER CLAIMS; COVENANT NOT TO SUE

1. Nothing in this Consent Agreement shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site.

2. Notwithstanding any provision of this Consent Agreement to the contrary, the Division covenants not to sue the Company for oversight costs incurred by the Division under this Consent Agreement in excess of the amounts specified in Section IX.

XIII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Agreement shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. The Company shall obtain or cause its representative(s) to obtain all permits and approvals necessary under such laws and regulations.

XIV. GOVERNING LAW

The provisions and interpretation of this Consent Agreement shall be governed by the law of the State of Nevada.

XV. SEVERABILITY

If any provision or authority of this Consent Agreement or the application of this Consent Agreement to either Party or any circumstances is held by any judicial or administrative authority to be invalid, and such holding does not result in a material change in the rights or obligations of the Parties, the application of such provisions to other circumstances and the remainder of the Consent Agreement shall remain in force and shall not be affected thereby.

XVI. EFFECTIVE DATE

This Consent Agreement shall become effective on the _____ day of June, 1999. This Consent Agreement may be executed in separate counterparts.

XVII. TERMINATION

After completion of the work required pursuant to the Workplan, the Company shall submit to the Division a Statement of Completion, which certifies that the Company has fulfilled all obligations under this Consent Agreement, including payment of any costs to the Division. Within a reasonable time after receipt of the Statement of Completion, the Division shall issue a written notice to the Company that all obligations under this Consent Agreement have been fulfilled. If the Division determines that all obligations have not been fulfilled, such notice shall specify the obligations the Division believes must be fulfilled in order to satisfy this Consent Agreement. All obligations of the Company created by the terms of this Consent Agreement shall be deemed satisfied and shall terminate upon issuance by the Division of written notice that the Company has fulfilled all obligations under this Consent Agreement.

IN WITNESS WHEREOF, the Division and the Company execute this Consent Agreement by their duly authorized representatives on this _____ day of June, 1999.

THE STATE OF NEVADA
DIVISION OF ENVIRONMENTAL

KERR-McGEE CHEMICAL LLC

PROTECTION

By:

Name:

Title:

By:

Name:

Title:

APPROVED AS TO FORM ONLY this ____ day of _____, 1999.

ATTORNEY GENERAL

STATE OF NEVADA
KENNY C. GUINN
Governor

Doug Allen



Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

PETER G. MOPROS, Director
ALLEN BIAGGI, Administrator
(775) 687-4670
TDD 687-4678
Administration
Water Pollution Control
Facsimile 687-5856

Mining Regulation and Reclamation
Facsimile 684-5259

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

May 28, 1999

Mr. Michael Turnipseed
State Engineer
123 West Nye Lane
Carson City, Nevada 89710

Dear Mr. Turnipseed:

As you are aware, the Nevada Division of Environmental Protection has been working with Kerr McGee Chemical Corporation (KMCC) and American Pacific Corporation (formerly PEPCON) to delineate and remediate perchlorate contamination in the subsurface of the Las Vegas Valley. Perchlorate is an ion of ammonium perchlorate; a solid rocket fuel ingredient. In association with these efforts, a significant surface spring in the vicinity of the Las Vegas Wash (SE/4 of the SW/4 of the SW/4, Sec. 30, T21S, R63E) has been discovered whose water contains significant concentrations of perchlorate. Preliminary estimates of the flow from this spring is 360 gallons per minute.

In the interest of public health and environmental quality, the Division has initiated discussions with KMCC for the interception and containment of the surface flow. KMCC, in accordance with direction from the Division of Environmental Protection, has committed to addressing the issue of the seep (see attached letter, KMCC to the Division). It is recognized both by the Division and KMCC that a number of issues must be resolved before this system can become operational. One of these issues is with regard to approval of the interception and containment of the seep from a water rights perspective.

As we have discussed, KMCC may apply for an environmental permit in accordance with NRS 533.4373 and that such a permit may be granted by the State Engineer within a short period of time after receipt of a complete application.

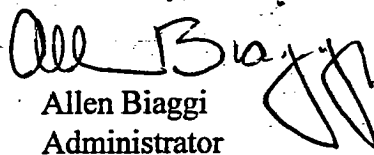
The mechanism of agreement between KMCC and the Division to initiate interception and containment activities will be through an enforceable consent agreement. This agreement will be under negotiation by the parties in the near future. The purpose of this letter is to provide to you a notice of environmental purpose pursuant to NRS 533.4373(1). The Division will ask KMCC submit a formal application to you within the next few weeks.

Michael Turnipseed
May 28, 1999
Page 2

Your prompt issuance of an environmental permit would be greatly appreciated.

If questions or comments arise, please contact me.

Sincerely,


Allen Biaggi
Administrator

cc: Pat Corbett, Plant Manager, KMCC
Verne Rosse, Deputy Administrator
Doug Zimmerman, Chief, Bureau of Corrective Actions



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

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PROTECTION

JUN -1 99

May 27, 1999

Mr. Alan Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi:

Subject: Reduction of Perchlorate Loading in the Las Vegas Wash

Nevada Division of Environmental Protection (NDEP) has identified their concern related to a groundwater seep in an area north of the lower BMI ponds; believed to be located within the SE/4 of the SW/4 of the SW/4, Sec. 30, T21S, R63E County of Clark, State of Nevada. NDEP believes that capture and containment of this seep will achieve substantial near-term perchlorate loading reductions in the Las Vegas Wash. NDEP has directed Kerr-McGee Chemical LLC (Kerr-McGee) to take certain immediate response measures to characterize and capture the surface discharge resulting from the seep.

It is understood that the activities described by this letter are intended as an interim measure, until such time as a more permanent perchlorate remedy can be identified and implemented. It is contemplated by the parties that these immediate response measures should be set forth in an Interim Consent Agreement with a mutually agreed upon schedule for project completion. Without conceding the appropriateness of such measures, Kerr-McGee has agreed to expeditiously negotiate an Interim Consent Agreement to capture and contain the seep.

However, the following concerns must be addressed before interim measures can be accomplished. These issues require the cooperation and support of organizations outside of Kerr-McGee. While Kerr-McGee will contact the appropriate organizations to express our needs and accomplishment of the ambitious schedule, NDEP support/participation is necessary and required. Kerr-McGee will report its progress in resolving the following concerns after the Contact Dates listed below:

<u>Concern</u>	<u>Contact Date</u>
1. The flow exists on Bureau of Land Management (BLM) property. Kerr-McGee will require approval for access and construction of facilities on BLM property.	6-04-99

	<u>Concern</u>	<u>Contact Date</u>
2.	State of Nevada surface waters will be diverted and will require the appropriate approvals and permits.	6-04-99
3.	Nevada State agencies will need to review and approve our actions as they relate to Wetlands Preservation and Endangered Species Protection.	6-04-99
4.	Once a process is designed, we will require building permits and land use permits through Clark County and the City of Henderson.	6-04-99
5.	Sufficient property needs to be accessed or acquired providing for containment construction together with ancillary structures.	6-11-99
6.	Right-of-way requirements need definition once the impoundment location is established to provide for electric power and pipeline installation.	6-11-99

The Consent Agreement will contain a mutually agreed upon schedule for completion of the interim containment project. While Consent Agreement negotiations are underway, under the guidance of NDEP, Kerr-McGee will perform the following activities toward achieving the aforesaid objectives:

	<u>Activity</u>	<u>Target Date</u>
1.	Provide Interim Consent Agreement draft to NDEP for comment.	6-07-99
2.	Characterize the seep.	6-21-99
3.	Characterize of the residue which would result from containment and evaporation of the seep.	6-30-99
4.	Determine if the residue resulting from evaporation of the flow would be potentially regulated as a RCRA waste.	6-30-99
5.	Characterize the discharge resulting from temporary treatment by reverse osmosis or other treatment systems.	6-30-99

	<u>Activity</u>	<u>Target Date</u>
6.	Locate suitable property for the construction of an impoundment to temporarily contain the seep, if the eleven (11) acre pond located on Kerr-McGee property is not suitable.	6-30-99
7.	Design the seep capture system.	6-30-99

Kerr-McGee remains committed to addressing the concerns of NDEP relating to the seep. Please call if you have any questions in this matter.

Sincerely,



P. S. Corbett
Plant Manager

PSC:jmr

xc: LKBailey
SMCrowley
ALDooley
WJGanus
WOGreen
TWRreed
JReichenberger
EMSpore
Brenda Pohlmann, NDEP (Las Vegas)
Doug Zimmerman, NDEP (Carson City)

PETER G. MORROS, Director
ALLEN BIAGGI, Administrator
(775) 687-4670
TDD 687-4678
Administration
Water Pollution Control
Facsimile 687-5856
Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor



DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

EZ -
For File
ALBI

hnd-del.
5/21/99 mlw

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

MEMORANDUM

May 21, 1999

To: Governor Kenny Guinn

Through: Pete Morros, Director, Department of Conservation and Natural Resources

From: Allen Biaggi, Administrator, Division of Environmental Protection

Subject: Pending Enforcement Action, Kerr McGee Chemical Company.

This memorandum is to advise you of an ongoing action by the Division of Environmental Protection concerning the Kerr McGee Chemical Company (KMCC) in Henderson, Nevada.

KMCC manufactured ammonium perchlorate, a solid rocket fuel ingredient, at the BMI Complex in Henderson for a number of years. Releases to ground water underlying the KMCC facility have occurred resulting in contamination to the Las Vegas Wash, a tributary to Lake Mead and the Colorado River. Perchlorate has been detected in the river from Lake Mead to the U.S./Mexico border. The presence of perchlorate in the Colorado River system has been of great concern to the State of Nevada, the Southern Nevada Water Authority whose water intakes are downstream in Lake Mead and the 23 million downstream users. The Division has been working with KMCC on strategies to remove the chemical from the ground and surface water systems. KMCC has been very responsive to the need for clean up and has expended significant resources to contain contaminated ground water at the plant site.

The federal Environmental Protection Agency has been closely monitoring this situation and will initiate actions of their own (hazardous waste/water pollution control orders) if the State is not successful in having the responsible party remove perchlorate from the system. EPA also has the authority to initiate a CERCLA (Superfund) 106 action where the agency could expend its own resources to halt the discharge. EPA would seek cost recovery against the responsible party; in this case KMCC. It has been the policy of the State of Nevada and the Division to conduct its own enforcement actions to compel compliance and avoid federal action.

Pete Morros
Memorandum
May 21, 1999
Page 2

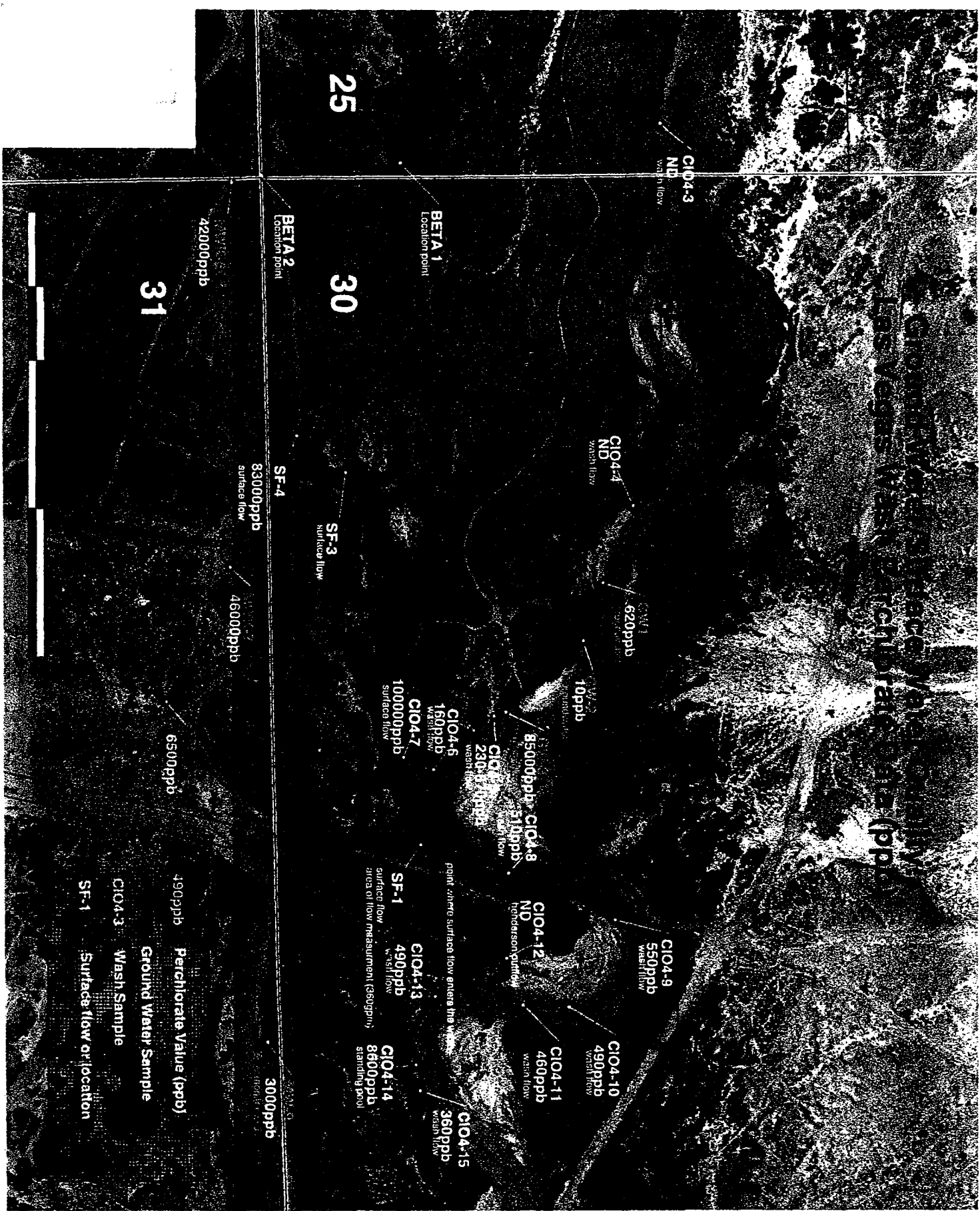
Approximately two weeks ago, a surface spring was found in close proximity to the Las Vegas Wash (see attached photo). This spring system has a flow of about 360 gallons per minute and has a perchlorate concentration of 100 parts per **million** (the provisional reference dose proposed by EPA is 32 parts per **billion**). This flow, which enters Las Vegas Wash, represents about 50% of the total perchlorate loading to the Colorado River system.

The presence of the spring provides a unique opportunity to capture a significant amount of the perchlorate loading to the River and provide immediate downstream water quality improvements. About a week ago, we entered into informal discussions with KMCC to capture and contain the flow from the spring. KMCC has legitimate liability, financial and other concerns with this action. The Division has drafted a Finding and Order to compel KMCC to initiate containment. We have shared this draft with the company in order to make it as workable and realistic as possible for the company while accomplishing the Division's clean up goals. A letter received from KMCC yesterday did not provide a firm commitment or schedule for capture. Discussions are continuing.

I received a call this morning from Scott Craigie, R & R Advertizing, who is representing KMCC. I outlined the situation to Mr. Craigie who related to me the concerns of KMCC from a corporate perspective. I indicated that while I understood his concerns, I felt the Division needed to initiate the action in the interest of public health and to preempt federal intervention.

A meeting with KMCC has been set for Monday May 24th. Our current schedule is to issue the Finding and Order the 25th or 26th.

If questions arise concerning this issue please contact me.



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99 MAY 24 PM 12:13



KERR-McGEE CHEMICAL LLC

POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

May 20, 1999

Mr. Alan Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi:

Kerr-McGee Chemical LLC has long been committed to investigation and implementation of a remedy for perchlorate in the groundwater. This commitment has resulted in the Company spending over three million dollars toward that end. At each step in this process, we have fully cooperated with NDEP and devoted resources to the request by NDEP to investigate and characterize the problem and look at potential solutions. As recently as February 5, 1999, Kerr-McGee set forth several commitments and request for action by the Agency to bring about a solution to this issue.

In an effort to address your concerns as to a surface discharge identified by the Southern Nevada Water Authority (SNWA) in an area below the BMI lower ponds, Kerr-McGee Chemical LLC will perform the following:

1. By May 27, 1999, we will measure the flow of surface discharge water identified in the area below the BMI lower ponds in order to characterize the variability, if any, in flow. At a minimum, two additional flow measurements will be made between May 27, 1999, and June 9, 1999. Characterization of flow is critical to any planned remedial actions in this area. Seasonal flow variation, composition changes, and sustainable flow rates are some of the variables involved which will not be evaluated with this limited sampling plan.
2. We will submit results of our research and investigation to NDEP on the flow identified near the Las Vegas Wash which will:
 - a) characterize the quality and quantity of the flow,
 - b) characterize the quality and quantity of residue which would result from containment and evaporation of the flow,
 - c) determine if the residue resulting from evaporation of the flow would potentially be regulated as a RCRA waste,
 - d) characterize the quality and quantity of the discharges resulting from temporary treatment by reverse osmosis or other treatment systems of the flow, and

Mr. Alan Biaggi
Page 2 of 2
May 20, 1999

- e) provide cost estimates for temporary treatment by reverse osmosis or other treatment systems which include mobilization, implementation, and monthly charges. Any provision for temporary treatment in this area would necessarily require a discharge permit and authorization from NDEP to discharge the perchlorate treated effluent.

By June 30, we will provide you with a written evaluation of remedial alternatives. Before implementation of any remedy, we would expect all responsible parties to enter into a Consent Agreement for such work or such parties be named in any Order issued by NDEP.

Kerr-McGee Chemical's stated commitment is to continue to act responsibly and cooperate fully with local, state, and federal officials to determine appropriate perchlorate remedial actions.

We look forward to continuing this work with you and your staff. If you have any questions related to our proposal, please contact me at (702) 651-2283.

Sincerely,



Patrick S. Corbett
Plant Manager

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Division of Environmental Protection
(Las Vegas Office)
Sawyer State Building
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101
(702) 486-2850 Fax (702) 486-2863

FAX COVER SHEET

Date: May 15, 1998

From: Brenda Polmann, Las Vegas Office

No. of Pages Including Cover Sheet: 2

To: Bob Kelso / Tom Whalen

FAX No. _____ Voice Phone: _____

Message: Just received this note from Kevin Mayer
at EPA Region 9. I told him that I didn't
think this was new information but that I would
follow up on it.

*Tom
FYI*

Printed by Brenda Pohlmann 5/15/1998 1:29pm

From: Mayer.Kevin @ epamail.epa.gov
To: Brenda Pohlmann
Subject: fwd: Perchlorate waste disposal insider Info

====NOTE=====5/15/98==3:10pm=====

Brenda - I was wondering why this message kept coming back to me as undeliverable. Now I know. Marshall Davis has loaned us overheads and 35mm slides of the Lake Mead figures in beautiful color. He also included figures of perchlorate concentration along depth profiles in the Lake Mead near Hoover Dam Outlet Tower for August, Dec., and March. Pretty interesting!

Kevin
Brenda - Are you interested in following up on this information? I will try to call him if you do not want to, but I will await your decision

Kevin
----- Forwarded by Kevin Mayer/R9/USEPA/US on 05/15/98
09:53 AM -----

William Thurston
05/15/98 09:23 AM

To: Kevin Mayer/R9/USEPA/US@EPA
cc: Ben Machol/R9/USEPA/US@EPA
Subject: Perchlorate waste disposal insider Info

Kevin: I got a call a couple of days ago from a guy who said he worked at/ for Kerr McGee in Henderson and one of his jobs was to haul and dispose of drums of waste from perchlorate processing areas. He talked about being a "cell tender" and disposing of the stuff from the mud dumpster that "Silver Slade" ? would not take. He says he knows where the barrels were buried (or maybe it was where they were emptied) and thought maybe we would like to know so sampling wells could be better located.

I told him I would pass along his name and # to those who are involved in developing the sampling protocol etc. His name is Robert Mayfield @ 702-293-4416 . Could you see that this info gets to the right people. He said he was retired and can usually be reached at that number.

Thanks
Bill

Fwd=by:=Brenda=Pohlma=====

Fwd to: mayer.kevin @ epamail.epa.gov

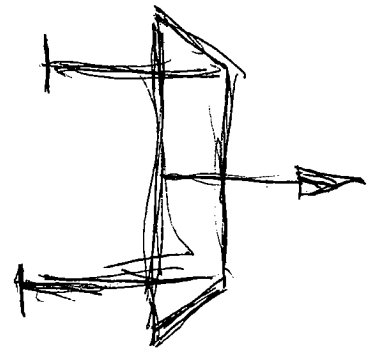
.....
Hi Kevin,
Just got your note.

6/10 4³⁰ →

ROBERT MAYFIELD
702-293-4416

7/1975 - 9/90

75-80 SUMPED



LABORER - BASEMENTS

MOD 55 GAL OPEN TRENCH

NO OF STAFFERS

CHLORATE IN SUMPS

UNIT 5 SUMP LEAKED

PRODUCT LEAKED INTO GROUND

COVINGTON & BURLING

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KUNSTLAAN 44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-549-5230
FACSIMILE: 32-2-502-1598

April 9, 1999 RECEIVED

APR 13 1999

ENVIRONMENTAL PROTECTION

The Honorable Richard Danzig
Secretary of the Navy
U.S. Department of the Navy
The Pentagon
Room 4E724
Washington, D.C. 20350

Re: Henderson Nevada, BMI Complex
Environmental Response Costs

Dear Mr. Secretary:

On January 11, 1999, on behalf of Kerr-McGee Chemical LLC ("Kerr-McGee"), I wrote to provide notice to the United States Navy regarding contamination of groundwater and surface water in Henderson, Nevada by perchlorate, a matter for which the Navy would appear to have substantial responsibility. My letter requested an opportunity for early dialogue with a representative of the U.S. Navy regarding this matter.

During the past three months, there have been additional developments. On February 5, 1999, Kerr-McGee submitted to the Nevada Division of Environmental Protection the attached "Perchlorate Design Assessment for Remedial Action." Subsequently, NDEP and Kerr-McGee have corresponded regarding this matter. Copies of NDEP's March 11, 1999, letter and Kerr-McGee's March 30, 1999, response are also attached.

For the reasons set forth in my January 11, 1999, letter and the attachments thereto, the Navy unquestionably should bear a portion of the mounting costs of the efforts to characterize and remediate this perchlorate contamination problem. It deserves emphasis that this is not simply a case where a private industrial firm manufactured a chemical in response to federal, national security requirements and is alleging "operator" liability on the part of the United States. Rather, it is manifest in this case that the Navy

The Honorable Richard Danzig

April 8, 1999

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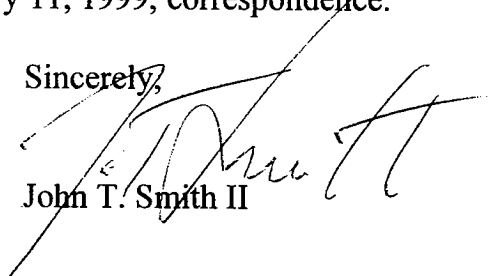
bears responsibility by virtue of actual historical ownership of perchlorate production facilities at Henderson, Nevada.

Kerr-McGee believes that the most cost effective and expeditious means to address this substantial environmental issue is continued voluntary cooperation with Nevada authorities. To date, the federal Environmental Protection Agency has been willing to defer to Nevada's lead in this matter, possibly in consideration of Kerr-McGee's vigorous, voluntary efforts to address the matter. Keeping the matter in this constructive and cost-effective context may depend, however, on the willingness of the U.S. Navy to open the dialogue requested in our January 11, 1999, letter. Including the cost of 11-acre impoundment described in the attached correspondence, Kerr-McGee has now expended more than \$3 million in responding to this perchlorate problem. Implementation of a biological treatment system as described in the attached will entail substantial additional expenditures.

We remain hopeful that we can reach an agreement with the U.S. Navy regarding a sensible arrangement for sharing of these burdens without having to undertake the trouble and expense of contribution litigation.

For your convenience, and in expectation of an early response to this letter, I am also attaching a copy of our January 11, 1999, correspondence.

Sincerely,



John T. Smith II

cc: Doug Zimmerman – w/attachments
Nevada Division of
Environmental Protection

The Honorable Richard Danzig

April 8, 1999

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bcc: BY MAIL

Peter M. Frank – w/attachments

Bill Green – w/o attachments

Joel Mack -- w/o attachments

Susan Steward – w/o attachments