ALLEN BIAGGI, *Administrator*

STATE OF NEVADA
KENNY C. GUINN
Governor

R. Michael Turnipseed, *Director*

Administration
Water Pollution Control
Air Quality
(702) 486-2850

Federal Facilities
Corrective Actions
Waste Management
Facsimile 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
(Las Vegas Office)
1771 East Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119-0837

November 19, 2003

Susan M. Crowley
Kerr-McGee Chemical LLC
PO Box 55
Henderson, Nevada 89009

RE: Perchlorate Remediation – 3rd Quarter 2003 Performance Report
Kerr-McGee Chemical LLC
NDEP Facility ID # H-000539

Dear Ms. Crowley:

The Nevada Division of Environmental Protection (NDEP) has received and reviewed the above referenced report. The NDEP recognizes the significant efforts that have been put forth by Kerr-McGee Chemical LLC (Kerr-McGee) to remediate perchlorate-impacted surface water and groundwater in Henderson, Nevada. We also appreciate the effort that is currently being put forth to construct the fluidized bed reactor system for the long-term remediation of perchlorate. However, we also believe additional optimization efforts are warranted at this time.

The NDEP has several observations regarding the efficiency of the existing Athens Road Well Field Remedial System. In review of this quarter's and previous quarter's potentiometric surface maps it is apparent that the capture of the existing system is not optimized. In the area between wells ART-4 and ART-5 there are no capture wells and the cones of depression do not appear to influence the groundwater movement in this area sufficient for full capture by this system. Perchlorate concentrations in this area appear to exceed 100 ppm. In the area to the east of well ART-7 there are no capture wells and the cones of depression do not appear to influence the groundwater movement in this area sufficient for adequate capture by this system. Perchlorate concentrations in this area appear to exceed 25 ppm. A review of these data and other information by NDEP and our consultant suggests that 100% capture is not being achieved at the Athens Road Well Field. It is possible that Athens Road Well Field capture efficiencies are substantially less than 100%. Furthermore, the MODLFLOW scenarios included in Attachment B appear to show more than one particle is passing through the Athens Road Well Field. These diagrams do not agree with the text on pages 5 and 6 of the report which indicates that one particle is passing through the Athens Road Well Field. As such, the NDEP requests that Kerr-McGee perform a quantitative

evaluation of the effectiveness of capture at the Athens Road Well Field and provide these results by **May 1, 2004**.

Additionally, the NDEP has suggestions for improvement of the efficiency of the Athens Road Well Field portion of the perchlorate remedial system. It appears that additional capture wells should be installed between wells ART-4 and ART-5 as well as to the east of well ART-7. A sufficient number of wells should be installed in these areas to permit overlapping cones of depression to coalesce into one large depression. We suggest that any new wells that are installed be coupled with a "buddy well" for contingency purposes. Additionally, a slurry wall could be installed down gradient of the existing Athens Road Well Field to bolster the capture efficiency. Placement of a slurry wall on the Kerr-McGee plant site in October 2001 doubled the yield from the on-site well field in a very short period of time. Use of a slurry wall in conjunction with the Athens Road Well Field could provide similar positive results. An alternate technology such as a permeable reactive barrier or an in-situ bioremediation system could also be applied to the plume in the Athens Road area.

Kerr-McGee is encouraged to present alternatives to the remedial systems outlined herein if such alternatives are focused at increased mass capture and well field optimization at the Athens Road Well Field. This is especially important given the mix of analytes in the groundwater in the Athens Road Well Field vicinity. An optimized well field should address the multiple analytes present in local groundwater.

NDEP requests that optimizations to the existing remedial system or an improved remedial system be on-line by **April 1, 2004**. A schedule for resolution of the issues outlined herein is expected by **January 2, 2004**. Please contact me at your earliest convenience to discuss this matter and to arrange a time to meet.

Sincerely,

Brian A. Rakvica, P.E.
Staff Engineer III
Bureau of Corrective Actions
NDEP-Las Vegas Office

Todd J. Croft, Supervisor
Remediation & LUST Branch
Bureau of Corrective Actions
NDEP-Las Vegas Office

cc: Leo Drozdoff, NDEP, Carson City
Jon Palm, NDEP, BWPC, Carson City
Jim Najima, NDEP, BCA, Carson City
Jennifer Carr, NDEP, BCA, Carson City
Jeff Johnson, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Alan Tinney, NDEP, BWPC, Carson City
Valerie King, NDEP, BWPC, Carson City
Tamara Pelham, NDEP, BWPC, Carson City
Mitch Kaplan, USEPA, Region IX, mail code: WST-5, 75 Hawthorne Street, San Francisco, CA 94105
Larry Bowerman, USEPA, Region IX, mail code: WST-5, 75 Hawthorne Street, San Francisco, CA 94105
Peggy Roefer, SNWA, 1900 E. Flamingo Road, Suite 170, Las Vegas, Nevada 89119
Joe Leising, SNWA, 1900 E. Flamingo Road, Suite 170, Las Vegas, Nevada 89119
Keith Bailey, Kerr-McGee, Kerr-McGee Center, PO Box 25861, Oklahoma City, Oklahoma 73125
Ranajit Sahu, BRC, 875 West Warm Springs Road, Henderson, Nevada 89015