May 18, 2006

Mr. Jeff Lux
Tronox Worldwide, LLC
P.O. Box 268859
Oklahoma City, OK 73126-8859

SUBJECT: TERMINATION OF SPECIAL NUCLEAR MATERIALS LICENSE NO. SNM-1999, CUSHING REFINERY SITE, OKLAHOMA

Dear Mr. Lux:

On May 11, 2006, Tronox Worldwide, LLC (Tronox) submitted an application for termination of the former Kerr-McGee Corporation (Kerr-McGee) Special Nuclear Materials (SNMs) License No. SNM-1999 for the Cushing Refinery Site located in Cushing, Oklahoma. The application states that Kerr-McGee has completed decommissioning and final status surveys (FSSs) of the Cushing Refinery Site, and the FSSs demonstrate that the site meets the criteria for decommissioning and release of the site for unrestricted use that are stipulated in Condition 11(N) of SNM-1999. Further, Kerr-McGee states that the post remediation conditions at the site meet the unrestricted release criteria of 10 CFR Part 20, Subpart E.

The U.S. Nuclear Regulatory Commission (NRC) staff has completed the review of the FSS Reports (FSSRs) and concludes in accordance with 10 CFR Part 70.38(k) that: (1) SNM has been properly disposed; (2) Reasonable effort has been made to eliminate residual radioactive contamination; (3) Submitted FSSRs and associated documentation, demonstrate that the facility and site are suitable for release in accordance with the criteria for decommissioning in License Condition 11(N); and (4) Records required by 70.51(a) [formerly required by 70.51(b)(6)] have been received. Therefore, License SNM-1999 is terminated, effective May 18, 2006.

The staff's review of the FSSRs is documented in the enclosed Safety Evaluation Report. Enclosure 2 is the Notice of Termination which is being sent to the *Federal Register* for publication.

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of General Applicability," a copy of this letter will be available electronically in the NRC Public Document Room or from the Publically Available Records component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions please contact John Buckley at (301) 415-6607.

Sincerely,

/RA/

Daniel M. Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

Enclosures:
1. Safety Evaluation Report
2. *Federal Register* Notice

Docket No.: 70-3073
License No.: SNM-1999

cc:
Cushing distribution list

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of General Applicability," a copy of this letter will be available electronically in the NRC Public Document Room or from the Publically Available Records component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions please contact John Buckley at (301) 415-6607.

Sincerely,

/RA/

Daniel M. Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

Enclosures:
1. Safety Evaluation Report
2. *Federal Register* Notice

Docket No.: 70-3073
License No.: SNM-1999

cc:
Cushing distribution list

DISTRIBUTION:
NMSS r/f DCD r/f DGillen RidsRgn4MailCenter

ML060960069

OFFICE	DWMEP:PM	DWMEP:Acting LA	DWMEP:SC	OGC	DWMEP:DD
NAME	JBuckley	Teresa Mixon	CCraig	STreby	DGillen
DATE	5/12/06	5/12/06	5/18/06	5/18/06	5/12/06

OFFICIAL RECORD COPY

SAFETY EVALUATION REPORT RELATED TO THE TERMINATION OF SPECIAL NUCLEAR MATERIALS LICENSE NO. SNM-1999 CUSHING REFINERY SITE, CUSHING, OKLAHOMA KERR-McGEE CORPORATION DOCKET NO. 70-3073

1.0 INTRODUCTION

Kerr-McGee Corporation (Kerr-McGee) used part of the former Cushing Refinery Site from 1962 through 1966 to process natural thorium and natural, depleted, and enriched uranium under two Atomic Energy Commission (AEC) licenses. The site was decommissioned and the licenses terminated in 1966. Contamination on-site resulted from the disposal and spraying of contaminated solid and liquid waste on portions of the site during operations, and the burial of wastes during decommissioning.

The U.S. Nuclear Regulatory Commission (NRC) granted Special Nuclear Material (SNM) License SNM-1999 to Kerr-McGee for the Cushing Refinery Site on April 6, 1993. The license authorizes possession of uranium and thorium onsite in concentrations above background levels. The license enables Kerr-McGee to possess contaminated soil, sludge, sediment, trash, building rubble, structures, and any other contaminated material at the Cushing Refinery Site during remediation and disposal activities.

Kerr-McGee has been remediating the site under a consent order with the Oklahoma Department of Environmental Quality (ODEQ). Kerr-McGee submitted its Decommissioning Plan (DP) on August 17, 1998, and NRC approved the DP on August 20, 1999.

The licensee conducted decommissioning activities at the Cushing Refinery Site in accordance with the approved DP from January 2000, to June 2005. In accordance with the approved DP, the licensee conducted final status surveys (FSSs) to demonstrate that the site meets the criteria for unrestricted release as stated in Condition 11(N) of SNM-1999. Details of the FSS results were submitted to the NRC in 15 separate FSS reports (FSSRs). Kerr- McGee also submitted a dose assessment which demonstrates that the site meets the unrestricted release criteria of 10 CFR Part 20, Subpart E. Additional information regarding each of these reports is provided in Section 2.2 of this safety evaluation report (SER).

Kerr-McGee submitted a request for termination of its SNM License on June 15, 2005 (ML051680329) with revisions on May 11, 2006 (ML061380781). Kerr-McGee revised its license termination request because a dose assessment demonstrates that the post remediation conditions at the site meet the unrestricted release requirements of 10 CFR Part 20, Subpart E. This SER documents the NRC's approval of Kerr-McGee's request for license termination.

2.0 EVALUATION

In accordance with 10 CFR Part 70.38(k), the Commission terminates SNM licenses when it determines that: (1) SNM has been properly disposed; (2) Reasonable effort has been made to eliminate residual radioactive contamination; (3) Submitted FSSRs and associated documentation, sufficiently shows that the site is suitable for release in accordance with the criteria for decommissioning as stipulated in 10 CFR Part 20, Subpart E; and (4) Records

required by 70.51(a) [formerly required by 70.51(b)(6)] have been received. The following is the staff's evaluation of this information.

2.1 Disposal of SNM

Section 3 of the DP provides a description of the decommissioning activities, including plans for disposal of contaminated material above the unrestricted release criteria at a licensed disposal facility. Kerr-McGee provided a detailed accounting of the waste shipments made to Envirocare of Utah, Inc., on NRC Form 314 - Certificate of Disposition of Materials (ML051680329).

The staff has reviewed the licensee's Certificate of Disposition of Materials and determined that the licensee has properly disposed of its SNM in accordance with its approved DP.

2.2 Elimination of Residual Radioactive Contamination

The decommissioning criteria used by Kerr-McGee at the Cushing Refinery Site are more protective of the public and environment than criteria established by the results of an "as low as reasonable achievable" analysis (Kerr-McGee, 1995). The criteria are also consistent with the Action Plan promulgated for the NRC Site Decommissioning Management Plan (SDMP) (NRC, 1992). Further, FSSs demonstrated that the post remediation condition of the site results in a dose less than the 25 mrem (milirem)/year (yr) unrestricted release criteria of 10 CFR Part 20, Subpart E. Therefore, the staff concludes that a reasonable effort has been made by Kerr-McGee to eliminate residual radioactive contamination.

2.3 Final Status Survey

The FSS is the radiation survey performed after an area has been fully characterized, remediation has been completed, and the licensee believes that the area is ready to be released for unrestricted use. The purpose of the FSS is to demonstrate that the area meets the radiological criteria for license termination.

Details of the FSS results were submitted to the NRC in the following FSSRs:

- Final Survey Report for the Unaffected Areas (ML060040090);
- Final Survey Report for the UA-2 Sediment Pond (ML060040039);
- Final Survey Report for Sector 1 (ML042020227, ML042020243);
- Final Survey Report for Sector 2 (ML050550111, ML050560319);
- Final Survey Report for Sector 3 (ML050550111, ML050560319);
- Final Survey Report for Sector 4 (ML050380138);
- Final Survey Report for Sector 5 (ML042020228, ML042020229);
- Final Survey Report for the Haul Road Corridor (ML060040071);
- Final Survey Report for Sector 6 (ML050690234);
- Final Survey Report for Sector 7 (ML050690363, ML050690365);
- Final Survey Report for Sector 8 (ML050760402);
- Final Survey Report for Sector 9 (ML051260153);
- Final Survey Report for Sector 10 (ML051240394);
- Final Survey Report for Sector 11 (ML050690365);
- Final Survey Report for Sector 12 (ML030830208, ML030830203).

The NRC conducted a number of performance-based in-process inspections of the licensee's FSS program during the decommissioning process. The purpose of the inspections was to verify that the FSS was being conducted in accordance with the commitments made by the licensee in the DP, and to evaluate the quality of the FSS by reviewing the FSS procedures, methodology, equipment, surveyor training and qualifications, document quality control, and survey data supporting the FSSRs. In addition, the NRC conducted a number of independent confirmatory surveys to verify the FSS results obtained and reported by the licensee. Confirmatory surveys consisted of surface scans for beta and gamma radiation, direct measurements for total beta activity, collection of smear samples for determining removable radioactivity levels, and collection and analysis of soil samples.

The staff's review and acceptance of the above referenced FSSRs is documented in correspondence with the licensee, and summarized below for completeness.

2.3.1 Final Survey Report for Sector 1

Kerr-McGee submitted Rev. 0 of the Sector 1 FSSR in November 2003 (ML033490695, ML033490697, ML033490699, ML033490700). The staff reviewed Rev. 0 and provided a Request for Additional Information (RAI) to Kerr-McGee on April 30, 2004 (ML041200561). Kerr-McGee responded to the RAI in May 2004 (ML041560467) and submitted Rev. 1 of the FSSR for NRC review in July 2004 (ML042020227, ML042020243). The staff accepted the FSSR in July 2004 (ML042100007). The staff concluded that the FSSR demonstrates that Sector 1 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion was based on its review of Kerr-McGee's FSSR and the results of confirmatory surveys. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-3073-02-004, 070-3073-03-002, and 070-3073-03-005 (ML030430068, ML031750873, and ML040410680).

2.3.2 Final Survey Report for Sector 2

Kerr-McGee submitted Rev. 0 of the Sector 2 FSSR in February 2005 (ML050550111, ML050560319). The staff concludes that the FSSR demonstrates that Sector 2 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of a confirmatory survey. Documentation of the confirmatory survey is presented in NRC Inspection Report 070-3073-04-001 (ML041130535).

2.3.3 Final Survey Report for Sector 3

Kerr-McGee submitted Rev. 0 of the Sector 3 FSSR in February 2005 (ML050550111, ML050560319). The staff concludes that the FSSR demonstrates that Sector 2 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of a confirmatory survey. Documentation of the confirmatory survey is presented in NRC Inspection Report 070-03073-04-001 (ML041130535).

2.3.4 Final Survey Report for Sector 4

Kerr-McGee submitted Rev. 0 of the Sector 4 FSSR in September 2004 (ML042780474, ML042780610, ML042780611, ML042780612). The staff reviewed Rev. 0 and provided a RAI to Kerr-McGee in January 2005 (ML050030086). Kerr-McGee responded to the RAI and submitted Rev. 1 of the FSSR for NRC review in February 2005 (ML050380138). The staff concludes that the FSSR demonstrates that Sector 4 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of confirmatory surveys. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-3073-00-002, 070-3073-01-003, 070-3073-03-005, and 070-3073-04-001 (ML003778550, ML013200160, ML040410680, and ML041130535).

2.3.5 Final Survey Report for Sector 5

Kerr-McGee submitted Rev. 0 of the Sector 5 FSSR in April 2003 (ML033370805, ML033370808, ML033370810). The staff reviewed Rev. 0 and provided a RAI to Kerr-McGee in March 2004 (ML040790357). Kerr-McGee responded to the RAI in April 2004 (ML041600168) and submitted Rev. 1 of the FSSR for NRC review in July 2004 (ML042020228, ML042020229). The staff accepted the FSSR in July 2004 (ML042100007). The staff concluded that the FSSR demonstrates that Sector 5 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion was based on its review of Kerr-McGee's FSSR and the results of a confirmatory survey. Documentation of the confirmatory survey is presented in NRC Inspection Report 070-3073-00-002 (ML003778550).

2.3.6 Final Survey Report for Haul Road Corridor and Sector 6

In May 1996, Kerr-McGee submitted a FSSR (ML060040071) for what was called the "Haul Road Corridor." This area is part of Sector 6, and release of the corridor within Sector 6 was requested by Kerr-McGee to allow for truck transport during remedial activities. NRC approved the use of the haul road corridor without radiation protection requirements in Amendment No. 5 to SNM-1999 in January 1997 (LL9701300022). In March 2005, Kerr-McGee submitted a Sector 6 FSSR Addendum (ML050690234) to release all of Sector 6. The staff reviewed the Sector 6 FSSR Addendum and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005 (ML052690269). The staff concludes that the FSSR Addendum demonstrates that all of Sector 6 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR Addendum and the results of confirmatory surveys conducted on the Haul Road Corridor and the remaining portions of Sector 6. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-3073-00-002 (Supplement), 070-3073-00-002, and 070-3073-04-002 (ML003778550, ML010370144, and ML031750873).

2.3.7 Final Survey Report for Sector 7

Kerr-McGee submitted Rev. 0 of the Sector 7 FSSR in February 2005 (ML050690363, ML050690365). The staff reviewed the Sector 7 FSSR and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005

(ML052690269). Based on Kerr-McGee's response the staff concludes that the FSSR demonstrates that Sector 7 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of confirmatory surveys. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-03073-04-002 and 070-03073-04-003 (ML041380390 and ML043010671).

2.3.8 Final Survey Report for Sector 8

Kerr-McGee submitted Rev. 0 of the Sector 8 FSSR in March 2005 (ML050760402). The staff reviewed the Sector 8 FSSR and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005 (ML052690269). The staff concludes that the FSSR demonstrates that Sector 8 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of confirmatory surveys. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-03073-03-003, 070-03073-04-001, and 070-03073-04-002 (ML032020491, ML041130535, and ML041380390).

2.3.9 Final Survey Report for Sector 9

Kerr-McGee submitted Rev. 0 of the Sector 9 FSSR in April 2005 (ML051260153). The staff reviewed the Sector 9 FSSR and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005 (ML052690269). Based on Kerr-McGee's response the staff concludes that the FSSR demonstrates that Sector 9 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR.

2.3.10 Final Survey Report for Sector 10

Kerr-McGee submitted Rev. 0 of the Sector 10 FSSR in April 2005 (ML051240394). The staff reviewed the Sector 10 FSSR and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005 (ML052690269). Based on Kerr-McGee's response the staff concludes that the FSSR demonstrates that Sector 10 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of confirmatory surveys. Documentation of the confirmatory surveys is presented in NRC Inspection Reports 070-03073-02-001, 070-03073-04-001, 070-03073-04-002, and 070-03073-04-003 (ML020860331, ML041130535, ML041380390, and Ml043010671).

2.3.11 Final Survey Report for Sector 11

Kerr-McGee submitted Rev. 0 of the Sector 11 FSSR in February 2005 (ML05690365). The staff reviewed the Sector 11 FSSR and provided a RAI to Kerr-McGee in September 2005 (ML052590168). Kerr-McGee responded to the RAI in September 2005 (ML052690269). Based on Kerr-McGee's response the staff concludes that the FSSR demonstrates that Sector 11 meets the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. The staff's conclusion is based on its review of Kerr-McGee's FSSR and the results of a confirmatory survey. Documentation of the confirmatory survey is presented in NRC Inspection Report 070-03073-04-001 (ML041130535).

2.3.12 Final Survey Report for Sector 12

Kerr-McGee submitted draft Sector 12 FSSR in July 2002 (ML030830208). Following telephone conversations between NRC and Kerr-McGee on results of NRC's review of the draft Sector 12 FSSR, Kerr-McGee submitted Rev. 1 of the Sector 12 FSSR in November 2002 (ML030830203). The staff accepted Rev. 1 of the Sector 12 FSSR in April 2003 after concluding that the FSSR demonstrated that Sector 12 met the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. NRC approved the release of Sector 12 from Kerr-McGee's license in License Amendment No.16 to SNM-1999, dated April 17, 2003 (ML031070038). The staff's conclusion was based on its review of Kerr-McGee's FSSR.

2.3.13 Final Survey Report for Unaffected Areas

Kerr-McGee submitted the FSSR for four unaffected areas of the Cushing site in April 1995 (ML060040090). The staff concluded that the FSSR demonstrates that the four unaffected areas meet the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999. Activities were allowed without radiation restrictions (minus the UA-2 Sediment Pond) in the four unaffected areas in December 1995 (LL9512150082), but the areas were not released from the license. The staff's conclusion was based on its review of Kerr-McGee's FSSR and the results of a confirmatory survey conducted by NRC contractors and documented in a report issued in July 1996 (LL9607260027).

Subsequently, Kerr-McGee requested release of the four unaffected areas (and portions of the haul road corridor of Sector 6) in October 1996 (LL9611080049). NRC approved release of these portions of the site in Amendment No. 9 of License No. SNM-1999 in May 1999 (LL9905070109). The staff's conclusions were based on confirmatory surveys of the four unaffected areas, and the portions of the haul road corridor, conducted in September 1995 and August 1996, respectively.

Kerr-McGee submitted Rev. 0 of the FSSR for UA-2 Sediment Pond in May 2000, Rev. 1 of the FSSR in November 2000, and Rev. 2 of the FSSR in January 2001 (ML060040039). The staff concluded in License Amendment No. 13 issued in July 2001 (ML012130075) that the FSSR demonstrated that the UA-2 sediment pond met the criteria for unrestricted release as presented in Condition 11(N) of SNM-1999, and released the UA-2 Sediment Pond from the Cushing site license.

2.4 Groundwater Remediation

Section 3.5 of the approved DP required Kerr-McGee to complete a radiological groundwater assessment of the Cushing site to:

- determine the range of background concentrations of natural radionuclides in groundwater,
- establish a groundwater monitoring system where licensed material may have contaminated groundwater, and
- evaluate the potential migration of radionuclides by sampling soil and/or groundwater, as necessary, at selected Radiological Material Areas (RMA) within Sectors.

Kerr-McGee submitted the Radiological Groundwater Assessment Report (GAR) on April 3, 2003. The NRC approved the GAR in a letter to Kerr-McGee dated May 27, 2004 (ML041400346). Based on the analysis of samples and data collected, the GAR concludes that groundwater contamination in the form of a uranium plume exists in the vicinity of Radiological Materials Area No.11 (RMA-11) within Sector 1 of the Cushing site. Model results indicated that total uranium concentrations have peaked along the centerline of the plume, which is still within the property boundary of the Cushing site. Further, the model predicts that groundwater concentrations of total uranium will not exceed U.S. Environmental Protection Agency's (EPA) Maximum Concentration Limits (MCL)[1] down-gradient of RMA-11 into Sector 5 of the Cushing site.

Kerr-McGee submitted a technical memorandum entitled, "*Alternate Concentration Limit (ACL) Derivation for Cushing*," on September 9, 2002 (ML022610452) requesting a license amendment to establish an ACL for total Uranium within the shallow groundwater at the Cushing facility rather than performing remediation of the groundwater to achieve the EPA MCLs. Following a review by the NRC, Kerr-McGee submitted Revision 1 to the technical memorandum (ML051920109). The technical memorandum concludes that 820 pCi (picocuries)/liter (l) of total uranium is the maximum concentration allowed in the shallow groundwater that would not exceed a dose to the average member of the critical group of 25 mrem/yr. The 820 pCi/l is based on an exposure pathway scenario for a resident farmer. The drinking water pathway was excluded from the analysis because the shallow water-bearing unit is not a viable source of drinking water. The Oklahoma Department of Environmental Quality, and the NRC, support this classification and evaluation of the shallow groundwater at the Cushing site. The NRC staff reviewed the technical memorandum, performed independent radiological analysis, and concluded that Kerr- McGee's analysis was acceptable.

Since the maximum concentration of total uranium measured in any groundwater sample to date is 102 pCi/l, Kerr-McGee has elected to withdraw its request for an ACL of 820 pCi/l. Instead, Kerr- McGee demonstrated that the as-left condition at the site will be less than the 25 mrem/yr unrestricted release criteria of 10 CFR Part 20.1402. Thus, no groundwater remediation was required at the site.

2.5 Documents Required for License Termination

10 CFR Part 70.51 requires licensees to forward specific records to NRC prior to license termination. These requirements include:

- Records of disposal of licensed material made under 20.2002 (including burials authorized before January 28, 1981), 20.2003, 20.2004, 20.2005;
- Records required by 20.2103(b)(4); and
- Records required by 70.25(g).

[1] The MCL is the level of a contaminant determined by the EPA and implemented by rule to be safe for drinking water as mandated under the Safe Drinking Water Act.

Section 2.2 of the DP contains information about the nuclear operating history of the Cushing site, including a discussion of past waste disposals on-site. The remediation completed removal of disposal of licensed material that had occurred under 20.2002, 20.2003, 20.2004, and/or 20.2005 at the Cushing site. Kerr-McGee did not dispose of any remediation waste under these waste disposal regulations under the license being terminated. Therefore, the NRC staff considers the requirements of 10 CFR Part 70.51(a)(1) satisfied for Cushing site license termination.

10 CFR Part 20.2103(b)(4) addresses records associated with the release of radioactive effluents to the environment. Kerr-McGee had no effluent release to the environment and therefore did not submit Radioactive Effluent Release Reports to the NRC. Therefore, the requirements of 10 CFR Part 70.51(a)(2) are not applicable.

Kerr-McGee also addressed the requirements of 10 CFR Part 70.51(a)(3). These regulations require the licensee to forward information important to decommissioning as required by paragraphs (1), (2), (3), and (4) of 10 CFR Part 70.25(g).

- 10 CFR Part 70.25(g)(1) requires licensees to submit information regarding records of spills or other unusual occurrences involving the spread of contamination in and around the facility. Chapters 2 and 3 of the Kerr-McGee Cushing Refinery Site - Site Decommissioning Plan, the Cushing Site - Radiological Characterization Report, Final Status Survey Reports provide this information, and Radiological Groundwater Assessment Report (ML022610452 and ML0519201090).

- 10 CFR Part 70.25(g)(2) requires licensees to submit as-built drawings and modifications of structures and equipment in restricted areas where radioactive material was used and/or stored and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. Chapter 2 of the Kerr-McGee Cushing Refinery Site - Site Decommissioning Plan provides this information.

- 10 CFR Part 70.25(g)(3) requires licensees to submit information regarding areas designated as restricted areas, or areas not designated as restricted areas, but have material requiring decontamination prior to license termination. Chapters 2 and 3 of the Kerr-McGee Cushing Refinery Site - Site Decommissioning Plan, and the Cushing Site - Radiological Characterization Report provide this information.

- 10 CFR Part 70.25(g)(4) requires licensees to submit information regarding the cost estimate for decommissioning and funding method used. Kerr McGee submitted its decommissioning funding plan in December 2003 (ML033510638). NRC approved the funding plan in March 2004 (ML040700292).

3.0 DOSE ASSESSMENT

The Kerr-McGee Cushing Site was designated an SDMP site in 1990. SDMP sites fall into one of two categories: (1) decommissioning under NRC's SDMP Action Plan Criteria ["grandfathered," pursuant to 10 CFR Part 20.1401(b)]; or (2) decommissioning under the License Termination Rule. Kerr-McGee submitted its DP before August 20, 1998, and had its DP approved by August 20, 2000, and thus became "grandfathered," and allowed to decommission to the SDMP Action Plan Criteria.

As a “grandfathered” site, Kerr-McGee is not required to submit a dose assessment to comply with license termination requirements. On October 14, 2005, Kerr-McGee submitted a technical memorandum containing residual source concentrations for each sector (ML052920696). Using the sector-averaged source concentrations, Kerr-McGee conducted a radiological assessment using the RESRAD computer code to estimate post-decommissioning dose to an average member of the critical group, and submitted a technical memorandum, also on October 14, 2005, documenting the results of this analysis (ML05290699). Kerr-McGee’s dose assessment demonstrated that the site meets the unrestricted release criteria of 10 CFR Part 20, Subpart E.

The NRC staff performed independent analyses to verify that the expected post-decommissioning dose to an average member of the critical group meets the unrestricted release requirements of 10 CFR Part 20, Subpart E. Based on the staff’s review of Kerr-McGee’s dose assessment and its own independent analyses, the staff concludes:

- The results of the staff’s probabilistic analysis shows a peak dose of 17.5 mrem/yr at eight years using the highest radionuclide concentration regardless of sector (conservative assumption). The primary radionuclide is Th-232 (Ra-228) contributing around 15 mrem/yr to the peak mean dose, while U-238 (and its daughter U-234) contribute about two mrem/yr.

- The staff concurs with the licensee’s assessment that residual contamination in buildings A-9 and Building 32 will not lead to significant doses. The surveys show residual surface contamination values lower than the DP limits and lower than the Regulatory Guide 1.86 limits. The expected doses from residual building contamination are expected to be less than one mrem/yr.

- Using a conservative value for uranium concentration in groundwater, the NRC staff concludes that a reasonable upper bound estimate for the dose from existing groundwater contamination is around three mrem/yr. This conclusion is based on the results of the NRC staff's evaluation for Kerr-McGee's ACL derivation for Cushing (ML051890261).

The results of NRC’s independent dose assessment of the Cushing Refinery Site are available in ADAMS at ML060330659.

4.0 STATE CONSULTATION

This SER was prepared by the NRC staff without input from the State of Oklahoma. However, the State is on distribution for all correspondence between NRC and Kerr-McGee and thus has been informed of NRC’s intention to terminate the Cushing site license.

5.0 ENVIRONMENTAL CONSIDERATIONS

Pursuant to 10 CFR Part 51, an environmental assessment (EA) was prepared and a finding of no significant impact (FONSI) was published in the *Federal Register* on August 23, 1999 (64 FR 45982) for approval of the DP. This SER documents Kerr-McGee’s acceptable implementation of the approved DP. Accordingly, no EA or FONSI will be prepared for termination of the Cushing Refinery Site license.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (I) The remaining dismantlement has been performed in accordance with the approved DP, (ii) The FSS and associated documentation demonstrate that the Cushing Refinery Site meets the criteria for decommissioning and release of the site for unrestricted use that are stipulated in Condition 11(N) of SNM-1999 and 10 CFR Part 20, Subpart E; and (iii) Kerr-McGee has met the Part 70 requirements for forwarding of specific records to NRC prior to license termination.

Principal Contributors: J. Buckley, NMSS/DWMEP/DCD

Date: May 18, 2006