UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE REGION SIX REGIONAL ADMINISTRATOR

In the matter of
CONCERNED CITIZENS FOR NUCLEAR SAFETY
REQUEST TO TERMINATE NPDES PERMIT
NM 0028355 FOR LOS ALAMOS NATIONAL
LABORATORY RADIOACTIVE LIQUID WASTE
TREATMENT FACILITY DUE TO LACK OF
DISCHARGES

REQUEST TO TERMINATE NPDES PERMIT # NM0028355 AS TO OUTFALL 051 FOR THE RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

I. STATEMENT OF FACTS.

1. This Request to Terminate NPDES Permit No. NM0028355 as to Outfall 051 is filed on behalf of the Applicant ("Petitioner" hereinafter), Concerned Citizens for Nuclear Safety ("CCNS"). The mission of CCNS, among other matters, is to address issues of public health and safety in connection with the nuclear weapons operations and legacy waste clean-up of the Los Alamos National Laboratory ("LANL"). The CCNS membership contributes financially, personally, or both to advance this mission. Members have participated in numerous hearings related to the hazardous waste, air, surface and ground water permitting of the LANL facility since the 1990s. Some CCNS members reside in the vicinity of Los Alamos, New Mexico, where LANL is located. CCNS members also reside at Santa Clara Pueblo, Pueblo de San Ildefonso, Española and Santa Fe, which are "downstream" and "downwind" of the operations of the LANL facility.

2. LANL is a federal facility within the terms of 33 U.S.C. § 1323 and 42 U.S.C. § 6961, owned by the U.S. Department of Energy ("DOE") and managed by Los Alamos National

Security, LLC. LANL's functions include design and development of nuclear weapons. Such functions involve use of radioactive and hazardous materials, the release of which would be dangerous to human health and the environment.

3. Members of CCNS are at risk from the release or mismanagement of radioactive and hazardous wastes at LANL. Releases of such wastes would create a direct and immediate risk to members of CCNS.

4. CCNS members, Kathy Wanpovi Sanchez and J. Gilbert Sanchez, who live at 38 O Toh Nah Po, Santa Fe, New Mexico 87508, within 11.5 miles from Outfall 051, which serves the Radioactive Liquid Waste Treatment Facility ("RLWTF"), and 6.25 miles from the LANL boundary at State Route 4 and Jemez Road, have authorized CCNS to represent them in this proceeding and any others necessary to obtain the relief sought herein, as they are persons who would suffer harm from releases of waste from the RLWTF and facilities transporting waste to and from the RLWTF. These representative CCNS members wish to participate in proceedings under the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6901 *et seq.*, to assure that the RLWTF operates safely and is regulated pursuant to RCRA. They believe that the current regime of regulation by the New Mexico Environment Department ("NMED") Ground Water Quality Bureau, resulting from the asserted exemption of the RLWTF from RCRA regulations, does not provide sufficient scrutiny and safeguards over the operations of the RLWTF and is not lawful or appropriate, where the RLWTF does not discharge pollutants into the environment that reach the waters of the United States and is not required, or even eligible, to have a permit to do so. *See generally*, 33 U.S.C. §§ 1311, 1342, 1362(12).

5. LANL operates the RLWTF at Technical Area 50 ("TA-50") within the LANL site. The RLWTF treats liquid radioactive and hazardous wastes generated at LANL, which are

delivered to the RLWTF by pipe and by truck. The RLWTF treats both low-level and transuranic radioactive and hazardous liquid waste. Such wastes contain hazardous constituents and come within the definition of "solid waste" and "hazardous waste" under RCRA, 42 U.S.C. § 6903(5), (27). RCRA is applied in New Mexico pursuant to a program under the New Mexico Hazardous Waste Act, §§ 74-4-1 *et seq.*, NMSA 1978, by action of the U.S. Environmental Protection Agency ("EPA").

6. Until late 2010, the RLWTF discharged to the environment certain pollutants that are regulated under the Clean Water Act, 33 U.S.C. § 1251 *et seq.* ("CWA"), through an outfall into a tributary to Mortandad Canyon. This outfall ("Outfall 051") is regulated under LANL's National Pollutant Discharge Elimination System ("NPDES"), 33 U.S.C. § 1342, permit No. NM0028355. LANL has maintained, and continues to maintain despite changed circumstances, that the RLWTF and its discharge through Outfall 051 are exempt from regulation under RCRA as a "wastewater treatment unit" and an NPDES discharge.[1]

7. The RLWTF was originally constructed at TA-50 in 1963. It was reconstructed in the early 2000's. The present RLWTF is designed and operated as a "zero liquid discharge" facility and has not discharged any liquid since November 2010. A 1998 LANL report[2] recited LANL's objective to attain zero liquid discharge: "Determining viable options for eliminating the discharge of treated radioactive liquid waste to Mortandad Canyon was the directive of the outfall 051 elimination working group."[3]

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[1] See 42 U.S.C. § 6903(27); 40 C.F.R. § 260.10 (*Tank system, Wastewater treatment unit*), and § 264.1(g)(6).

[2] Moss, et al., "Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility," (1998) (Ex. A).

[3] *Id.*, Ex. A at v.

8. The 1998 report emphasizes that the adoption of zero liquid discharge will cause elimination of the RCRA exemption, thus imposing additional regulatory requirements: "Under RCRA, wastewater treatment facilities that are subject to NPDES permit limits may qualify for exemption from certain RCRA requirements, including engineering design standards. When the RLWTF implements zero liquid discharge, if the NPDES permit for Mortandad Canyon is deleted, current exemptions would not apply. RCRA-listed wastes are already administratively prohibited from the RLW ["Radioactive Liquid Waste"] stream. However, the potential for exposure to increased RCRA regulatory coverage with zero discharge underscores the need for better administration and documentation of compliance with WAC ["Waste Acceptance Criteria"] requirements."[4]

9. LANL's 1998 report states that the loss of the RCRA exemption was an "important consideration" in planning: "Loss of this exemption would mean that the RLWTF would be required to meet additional RCRA regulatory guidelines regarding waste treatment practices. RCRA guidelines regarding waste treatment at the RLWTF would focus on concentrations of metals and organics in the RO ["reverse osmosis"] concentrate stream and sludges produced at the RLWTF. The RLWTF would need to manage the constituents in the waste stream and so have much better knowledge of, and control over, wastes discharged to it for treatment."[5]

10. In sum: "[T]he loss of the NPDES permit at the RLWTF will cause the loss of the RCRA exemption for the RLWTF. RCRA regulatory oversight will increase at the RLWTF.

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[4] *Id.*, Ex. A at 12.

[5] *Id.*, Ex. A at 32.

NPDES regulatory oversight will decrease."[6] Also: "As regulatory requirements become more stringent and as the possibility of eliminating outfall 051 progresses, it will be important to have complete characterization of wastes discharged to the RLWTF. . . . If the outfall 051 NPDES permit is allowed to be deleted, operation of the RLWTF will fall under RCRA guidelines. Management of waste at the source, including management of the waste generators' WAC and management of facility connections to the collection system, is a necessary part of this process. Specific monitoring regimes will be required by the RLWTF."[7]

11. If the RLWTF were regulated under RCRA, it would be subject, *inter alia*, to detailed protective RCRA requirements, calling for, *e.g.*, a public permitting process for approval of any new construction (40 C.F.R. § 270.10(f)), assurances of the engineering integrity of tank systems (40 C.F.R. §§ 264.190-.200), and completeness of closure planning (40 C.F.R. §§ 264.110-.120). LANL has maintained that these and other requirements do not apply to the RLWTF under its RCRA exemption. These requirements are applied under a public process, therefore enabling members of the public, such as CCNS's representative members, Kathy Wanpovi Sanchez and J. Gilbert Sanchez, to advocate higher levels of public health and safety assurance in the operation of the RLWTF than are provided under the New Mexico state regulation of the facility pursuant to its ground water quality regulations.

12. Despite LANL's expressed concerns about the loss of the RCRA exemption, LANL advised NMED that zero liquid discharge at the RLWTF was LANL's "ultimate goal."[8]

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[6] *Id.*, Ex. A at Table 6.

[7] *Id.*, Ex. A at 37.

[8] Letter, Hanson and Rae to Bustamante (Sept. 3, 1998) (Ex. B).

LANL repeatedly so advised EPA.[9] NMED has stated publicly that elimination of Outfall 051 is a desirable goal.[10]

13. During the RLWTF's reconstruction, LANL advised EPA and NMED of the upgrades.[11] LANL's January 2012 NPDES re-application lists 12 submissions concerning changes at the RLWTF.[12]

14. Elsewhere than at the RLWTF, LANL has striven to reduce the number of outfalls at LANL subject to NPDES regulation under its sitewide Outfall Reduction Program.[13] LANL asked EPA to delete from the NPDES permit outfalls that are "no longer in use."[14] LANL

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[9] *See* Letter, Erikson and Baca to Coleman (Mar. 18, 1999) (Ex. C); Letter, Rae to Coleman (Dec. 22, 1999) (Ex. D); Letter, Rae to Coleman (June 13, 2000) (Ex. E).

[10] *See* Letter, Yanicak to Coghlan (CCNS) (May 12, 1999) at 2 (Ex. F).

[11] *See* Letter, Rae to Coleman (Oct. 22, 2001) (Ex. G); Letter, Rae to Coleman (Jan. 31, 2002) (Ex. H); Letter, Rae to Coleman (May 7, 2002) (Ex. I); Letter, Rae to Coleman (Nov. 27, 2002) (Ex. J); Letter, Rae to Strickley (April 18, 2003) (Ex. K); Letter, Grieggs to Hall (May 14, 2007) (Ex. L); Letter, Grieggs to Hall (May 6, 2008) (Ex. M); Letter, Grieggs and Turner to Hall (June 3, 2010) (Ex. N); Letter, Grieggs and Turner to Hall (Aug. 19, 2010) (Ex. O); Letter, Grieggs and Turner to Hall (Sept. 16, 2010) (Ex. P); Letter, Grieggs and Turner to Hall (Dec. 9, 2010) (Ex. Q); Letter, Grieggs and Turner to Simmons (Feb. 23, 2011) (Ex. R); Letter, Grieggs and Turner to . Chen (Feb. 23, 2011) (Ex. S); Letter, Grieggs and Turner to Branning (Sept. 28, 2011) (Ex. T); Letter, Grieggs and Turner to Branning (Nov. 16, 2011) (Ex. U); Letter, Dorries and Turner to Schoeppner (July 25, 2013) (Ex. V).

[12] Letter, Dorries and Smith to Hosch (Jan. 27, 2012) with attached excerpts from February 2012 Los Alamos National Laboratory, NPDES Permit No.NM0028355, 2012 NPDES Permit Re-Application, concerning Outfall 051, and Form 2C, showing no discharge from Outfall 051 after November 2010. (Ex. W).

[13] Los Alamos National Laboratory, NPDES Permit No. NM0028355, 1998 NPDES Permit Re-Application, at 11-12 (May 1998) (Ex. X); Letter, LANL to Saums, with Response to NMED-SWQB Review Comments, at 9-10 (Mar. 10, 1999) (Ex. Y); Letter, Rae to Hathaway with attached Benchmark Environmental report (Mar. 18, 1999) (Ex. Z); NPDES Permit No. NM0028355 Fact Sheet, at 10-14 (Oct. 18, 1999) (Ex. AA).

[14] Letter, Gurulé to Hathaway (Nov. 25, 1998) (Ex. BB); Letter, Erickson to Hathaway (Oct. 26, 1999) (Ex. CC).

reported that outfall 001B was out of use and could be deleted.[15] LANL stated that outfall 03A028, associated with the closed PHERMEX facility, could be deleted.[16] The 2007 NPDES permit omitted Outfalls 001B and 03A028.[17] For its part, NMED has suggested that unused outfalls be deleted from the permit.[18] LANL's NPDES application omitted these outfalls.[19] The 2008 LANL Site-Wide Environmental Impact Statement ("SWEIS") reports the closing of several outfalls.[20] In 1999 there were 36 permitted outfalls; in 2005 there were 21. Further: "Thirty-five outfalls were removed from service as a result of efforts to reroute and consolidate flows and eliminate outfalls. . ."[21]

15. The need for the RLWTF is diminishing. The 2008 LANL SWEIS shows that LANL liquid waste production has steadily declined in 1999-2005 and RLWTF discharge volume has steadily decreased.[22] The 2008 SWEIS notes that elimination of RLWTF discharges would minimize the potential to mobilize contaminated sediments.[23]

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[15] LANL Comments on EPA Preliminary Draft NPDES Permit, Part II at 5 (Mar. 17, 2005) (Ex. DD).

[16] LANL NPDES Permit No. NM0028355 Comments on Draft Permit, at 8-9, 13, 15 (Mar. 30, 2006) (Ex. EE).

[17] Letter, Lane to Wilmot with attached NPDES Permit (July 17, 2007) (Ex. FF).

[18] Letter, Saums to Rae at 5, 6 (Feb. 2, 1999) (Ex. GG); Letter, Ferguson to Gurulé (Oct. 13, 1999) (EX. HH); Letter, Yanicak to Casalina (June 2, 2011) (Ex. II).

[19] Los Alamos National Laboratory, NPDES Permit No. NM0028355, 2012 NPDES Permit Re-Application (January 27, 2012) (Ex. W).

[20] Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory at 4-43, Table 4-12 at 4-44 (2008) ("SWEIS") (Ex. JJ).

[21] *Id.*, Ex. JJ, SWEIS at 4-43.

[22] *Id.*, Ex. JJ, SWEIS Table 4-13, at 4-46; 4-48.

[23] *Id.*, Ex. JJ, SWEIS at 5-38; *see* G-76.

16. However, LANL has consistently scheduled the RLWTF outfall to remain in the NPDES permit.[24] Despite the extensive changes to the RLWTF looking to the goal of zero liquid discharge, LANL sought to continue the RCRA exemption. When LANL told EPA about planned construction of concrete "evaporation tanks" for the RLWTF, LANL also put forth its theory that the "tanks" would be exempt from RCRA.[25]

17. The 2008 SWEIS, Appendix G, discusses alternative designs for the "upgrade" of the RLWTF.[26] In the first Record of Decision ("ROD") based on the 2008 SWEIS, DOE determined to pursue design of a Zero Liquid Discharge RLWTF.[27] In a later ROD, DOE expressly determined to construct and operate a new RLWTF and operate the Zero Liquid Discharge facility.[28]

18. LANL's 2012 NPDES permit renewal application sought a permit for 11 outfalls, one of which was Outfall 051[29], even though Outfall 051 was falling out of use. LANL stated in the 2012 re-application that "[t]he configuration of the RLWTF and Outfall 051 will be changing

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[24] NPDES Permit No. NM0023855 Fact Sheet for the Draft NPDES Permit to Discharge to the Waters of the United States at 21 (Oct. 18, 1999) (Ex. AA); February 2012 Los Alamos National Laboratory, NPDES Permit No. NM0028355, 2012 NPDES Permit Re-Application, concerning Outfall 051, and Form 2C, showing no discharge from Outfall 051 after November 2010 (Ex. W).

[25] Letter, Grieggs to Hall (May 14, 2007) (Ex. KK).

[26] Ex. JJ, SWEIS at G-60, G-73, G-83, G-88.

[27] Record of Decision, Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, 73 Fed. Reg. 55833, 55839 (Sept. 26, 2008) (Ex. LL).

[28] Record of Decision, Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory.74 Fed. Reg. 33232, 33235 (July 10, 2009) (Ex. MM).

[29] Ex. W, February 2012 Los Alamos National Laboratory, NPDES Permit No. NM0028355, 2012 NPDES Permit Re-Application, concerning Outfall 051, and Form 2C, showing no discharge from Outfall 051 after November 2010.

in the next 5 years due to the construction of two new Concrete Evaporation Tanks at Technical Area (TA) 52 under the Zero Liquid Discharge (ZLD) Project."[30]

19. Thus, LANL sought a continued permit for Outfall 051—but expressly requested a permit only for a *possible* discharge: "The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can *maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission*."[31] LANL gave no pollutant discharge data for Outfall 051 (which was not discharging anything) and explained that a "composite sample for the Form 2C constituents will be collected from Outfall 051 *when/if the RLWTF discharges effluent* to Mortandad Canyon."[32] EPA confirmed that "[t]he facility includes the outfall [051] in the application *in case the evaporator becomes unavailable* due to maintenance, malfunction, and/or capacity shortage."[33]

20. LANL's NPDES permit comments repeat that, since the RLWTF's conversion to zero liquid discharge, Outfall 051 appears in the application only as a fallback, for use in possible contingencies: "The Laboratory's TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) has not discharged since November 2010 as a result of using the mechanical evaporator. Additionally, RLWTF has constructed two Zero Liquid Discharge (ZLD) tanks that can passively evaporate treated effluent. The ZLD tanks are currently being processed for

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[30] *Id.*, Ex. W at 7 of 9.

[31] *Id.*, Ex. W at 5 of 9 (*emphasis supplied*).

[32] *Id.*, Ex W at Form 2C (*emphasis supplied*).

[33] NPDES Permit No. NM0028355 Fact Sheet for the NPDES Permit to Discharge to Waters of the United States at 12 (June 26, 2013) (Ex. NN) (*emphasis supplied*).

permitting under the NMED's Ground Water Discharge Permit program and are not currently in operation. Based on discharge records prior to November 2010, and with options of using the existing mechanical evaporator or new ZLD evaporation tanks, RLWTF would discharge to Outfall 051 only once or twice per week *if evaporation is not an option*."[34]

21. LANL's statement, quoted above, first, admits that the RLWTF would have two options to evaporate liquid waste, *viz*: mechanical evaporator and evaporation tanks, and, second, suggests that evaporation might somehow not be "an option"—without explaining how both evaporation systems might become unavailable, nor how probable such a situation would be.

22. LANL's submission also asked leave to omit pollutant values for Outfall 051 discharges and supply them only if discharges take place: "DOE/LANS request that opportunity to provide EPA w*ith new data for Outfalls 051 a*nd 05A055, *if discharges through these outfalls are initiated* during the life of the new permit."[35]

23. A mid-2014 LANL report states: "Discharges from Outfall 051 decreased significantly after the mid-1980s and effectively ended in late 2010."[36] In late 2014 NMED reported to EPA Region 6 that Outfall 051 had not discharged since November 2010.[37] A LANL web site, NPDES Industrial Outfall Locations, states that "a mechanical evaporator was installed so no water has been discharged at Outfall 051 since November 2010."[38]

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[34] Los Alamos National Laboratory, NPDES Permit No. NM0028355, Comments on Draft NPDES Permit Issued June 29, 2013 at 3 (Aug. 13, 2013) (Ex. OO) (*emphasis supplied*).

[35] *Id.*, Ex. OO at 5, ¶ 8 (*emphasis supplied*).

[36] Isotopic evidence for reduction of anthropogenic hexavalent chromium in Los Alamos National Laboratory groundwater, 373 Chemical Geology 1, 4 (May 12, 2014) (Ex. PP).

[37] Letter, Yurdin to Dories with Inspection Report, at 4th page (Aug. 5, 2014) (Ex. QQ).

[38] LANL web site, NPDES Industrial Permit Outfall Locations, http://www.lanl.gov/community-environmental-stewardship (reviewed on Oct. 2, 2015) (Ex. RR).

reported to EPA Region 6 that Outfall 051 had not discharged since November 2010.[37] A LANL web site, NPDES Industrial Outfall Locations, states that "a mechanical evaporator was installed so no water has been discharged at Outfall 051 since November 2010."[38]

24. The Final Permit, dated August 12, 2014, refers to regulation of discharges from Outfall 051 *if discharges resume*.[39]

25. EPA, on December 19, 2014 issued a draft permit modification, denying a compliance schedule for Outfall 051. EPA stated that "[n]o discharge has occurred since 2010. The permittees can start evaluating the treatment technology and operation practices prior to the next discharge."[40] Thus, EPA saw no urgency to determine the Outfall's compliance, since a discharge from Outfall 051 was not viewed as imminent.

26. When LANL's permit re-application was filed in January 2012, discharges from Outfall 051 had ended only about a year before. Today, no discharges from Outfall 051 have occurred for over five years. Based on five blank years, it is apparent that LANL has no intention of discharging through Outfall 051.

II. GOVERNING LAW.

27. NPDES permits may be granted only for "the discharge of any pollutant, or combination of pollutants." 33 U.S.C. § 1342(a)(1). Regulations define "discharge" to mean

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[37] Letter, Yurdin to Dories with Inspection Report, 4th page (Aug. 5, 2014) (Ex. QQ).

[38] LANL web site, NPDES Industrial Permit Outfall Locations, http://www.lanl.gov/environment/protection/compliance/industrial-permit/index.php (reviewed on June 17, 2016) (Ex. RR).

[39] Letter, Honker to Dorries, with Response to Comments and Authorization to Discharge under the National Pollutant Discharge Elimination System at 15, 17 (Aug. 12, 2014) (*emphasis supplied*) (Ex. SS).

[40] Letter, Hosch to Lebak, with U.S. EPA Public Notice of Draft NPDES Permit(s), Fact Sheet at 4 (Dec. 19, 2014) (Ex. TT).

a discharge could occur and that permit coverage is needed."[41] But the CWA contains no authority to issue a permit for a discharge that "could occur," nor for a "capability" to discharge.

29. There are controlling precedents. EPA in 2003 issued CWA regulations for concentrated animal feeding operations ("CAFOs").[42] EPA's express premise was that any large CAFO (as defined) has the *potential* to discharge, and so must obtain a NPDES permit, even if there was no discharge: "The 'duty to apply' provision is based on the presumption that every CAFO has a *potential to discharge* and therefore must seek coverage under an NPDES permit."[43]

30. EPA's regulatory premise was conclusively rejected by the courts. In *Waterkeeper Alliance, Inc. v. U.S. Environmental Protection Agency*, 399 F.3d 486 (2d Cir. 2005), the Court of Appeals for the Second Circuit held that "in the absence of an actual addition of any pollutant to navigable waters from any point, there is no point source discharge, no statutory violation, no statutory obligation of point sources to comply with EPA regulations for point source discharges, and no statutory obligation of point sources to seek or obtain an NPDES permit in the first instance." *Waterkeeper Alliance*, 399 F.3d at 505. In sum, "the Clean Water Act gives the EPA *jurisdiction to regulate and control only actual discharges—not potential discharges*, and certainly not point sources themselves." *Id.* (*emphasis supplied*). The court expressly ruled that, under *Chevron U.S.A. Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984), analysis, EPA had *no discretion* to regulate potential discharges: "Congress has 'directly spoken to the precise question at issue' and 'the intent of Congress is clear, that is the end of the matter; for the

[41] Letter, S. Dwyer to L. Lovejoy (Dec. 18, 2015) (Ex. UU).

[42] *See generally*, National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176 (Feb. 12, 2003).

[43] *Id.*, at 7202 (*emphasis supplied*).

court, as well as the agency, must give effect to the unambiguously expressed intent of Congress'." *Id.* at 506.

31. Despite that categorical ruling, after *Waterkeeper* EPA went back and drafted new CAFO regulations, again seeking to regulate facilities that were not discharging—but supposedly had a "potential" to discharge.[44]

32. EPA admitted that "the CWA subjects only actual discharges to permitting requirements rather than potential discharges."[45] However, reasoning that it could regulate "any person who discharges or proposes to discharge pollutants"[46], EPA issued 2008 CAFO rules, containing objective criteria identifying facilities that were "proposing to discharge."[47]

33. The 2008 rules called "for a case-by-case evaluation by the CAFO owner or operator as to whether the CAFO discharges or proposes to discharge from its production area or land application area based on actual design, construction, operation, and maintenance."[48] EPA reasoned that "a CAFO proposes to discharge if based on an objective assessment it is designed,

[44] See Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines for Concentrated Animal Feeding Operations in Response to Waterkeeper Decision, 71 Fed. Reg. 37744 (June 30, 2006); Revised National Pollutant Discharge Elimination System Permit Regulations for Concentrated Animal Feeding Operations; Supplemental Notice of Proposed Rulemaking, 73 Fed. Reg. 12321 (Mar. 7, 2008); Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to Waterkeeper Decision, 73 Fed. Reg. 70418 (Nov. 20, 2008).

[45] 71 Fed. Reg. at 37746-47, 37748; *see also* 73 Fed. Reg. at 12324, 73 Fed. Reg. at 70420, 70422.

[46] 71 Fed. Reg. at 37747-48.

[47] 71 Fed. Reg. at 37744, 37748; 73 Fed. Reg. at 70422 and 70423-25.

[48] 73 Fed. Reg. at 70423.

constructed, operated, or maintained such that a discharge will occur, not simply such that it might occur."[49]

34. The Court of Appeals for the Fifth Circuit rejected EPA's second attempt to issue CWA permits based upon a potential to discharge: "Instead, the EPA's definition of a CAFO that 'proposes' to discharge is a CAFO designed, constructed, operated, and maintained in a manner such that the CAFO will discharge. Pursuant to this definition, CAFOs propose to discharge regardless of whether the operator wants to discharge or is presently discharging. This definition thus requires CAFO operators whose facilities are not discharging to apply for a permit and, as such, runs afoul of *Waterkeeper*, as well as Supreme Court and other well-established precedent." *National Pork Producers Council v. U.S. Environmental Protection Agency*, 635 F.3d 738, 750 (5th Cir. 2011).

35. The Fifth Circuit quoted the Supreme Court (635 F.3d at 750) : "The triggering statutory term here is not the word 'discharge' alone, but 'discharge of a pollutant,' a phrase made narrower by the specific definition requiring an 'addition' of a pollutant to the water. § 1362(12)." *S.D. Warren Co. v. Maine Board of Environmental Protection*, 547 U.S. 370, 380-81 (2006). It added (635 F.3d at 750) that "several circuit courts have held that the scope of the EPA's authority under the CWA is strictly limited to the discharge of pollutants into navigable waters," citing *Natural Resources Defense Council, Inc. v. EPA*, 859 F.2d 156, 170 (D.C. Cir. 1988), and *Service Oil, Inc. v. EPA*, 590 F.3d 545, 550 (8th Cir. 2009).

36. The appellate court emphasized that: "These cases leave no doubt that there must be an actual discharge into navigable waters to trigger the CWA's requirements and the EPA's authority. . . . Any attempt to do otherwise exceeds the EPA's statutory authority. Accordingly,

[49] 73 Fed. Reg. at 70423-24.

we conclude that the EPA's requirement that CAFOs that "propose" to discharge apply for an NPDES permit is *ultra vires* and cannot be upheld." (635 F.3d at 751). The court added: "In summary, we conclude that the EPA cannot impose a duty to apply for a permit on a CAFO that 'proposes to discharge' or any CAFO before there is an actual discharge." *Id.* To repeat, "there must be an actual discharge into navigable waters to trigger the CWA's requirements and the EPA's authority." *Id.*

37. After the Fifth Circuit decision, EPA abandoned its effort to require a permit for a potential discharge. EPA withdrew regulations requiring a NPDES permit for a facility that, by regulatory tests, "proposes to discharge."[50] EPA conceded: "The EPA accepts the decision of the Court that vacated the requirement that CAFOs that propose to discharge apply for NPDES permits and the EPA lacks the discretion to reach a different conclusion."[51]

38. "The District of Columbia Circuit has held that for NPDES requirements to apply to any given set of circumstances, 'five elements must be present: (1) a *pollutant* must be (2) *added* (3) *to navigable waters* (4) *from* (5) *a point source.*' *National Wildlife Federation v. Gorsuch*, 693 F.2d 156, 165 (D.C. Cir. 1982)." *National Wildlife Federation v. Consumers Power Co.*, 862 F.2d 580, 583 (6th Cir. 1988). Since the *Waterkeeper* decision, EPA's Office of General Counsel has stated, and EPA administrative proceedings have ruled, that EPA "cannot require one to obtain an NPDES permit on the basis of a mere potential to discharge." *In re Vos*, 2009 EPA ALJ LEXIS 47 at 63 (Dec. 2, 2008).

[50] National Pollutant Discharge Elimination System Permit Regulation for Concentrated Animal Feeding Operations: Removal of Vacated Elements in Response to 2011 Court Decision, 77 Fed. Reg. 44494 (July 30, 2012).

[51] *Id.*, at 44496.

39. Thus, the courts have ruled explicitly and repeatedly, and EPA has concurred: EPA did not seek certiorari in *Waterkeepers*, nor in *National Pork Producers;* instead it withdrew the contested regulations. Clearly, EPA acquiesced in the decisions. EPA expressly conceded that EPA "lacks the discretion to" issue a NPDES permit based only on the fact that a facility may possibly discharge. EPA's issuance of a CWA permit for Outfall 051 based upon LANL's statement that Outfall 051 "could" discharge violates the CWA.

40. There is no discharge through Outfall 051. No discharge through Outfall 051 is planned or proposed. The permit should be terminated for Outfall 051.

41. LANL's NPDES permit is subject to conditions stated in 33 U.S.C. § 1342(b)(1), including that the permit "can be terminated or modified for cause including . . . change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge."[52]

42. In addition, regulations state that permit modification or revocation and reissuance are available in event of facility alterations, new information, new regulations, and similar situations. (40 C.F.R. § 122.62). Termination is available in event of a change in conditions, including discharge reduction, notably: "A change in any condition that requires either a temporary or permanent reduction or elimination of any discharge or sludge use or disposal practice controlled by the permit . . . ." (40 C.F.R. § 122.64(a)(4)).

43. Further, 40 C.F.R. § 122.64(b) states that "the Director shall follow part 124 of this chapter . . . for termination." Part 124 contains specific provisions on modification, revocation and reissuance, or termination. (40 C.F.R. § 124.5). This section allows an application to be made by "any interested person" to which the Director may respond. (40

[52] 33 U.S.C. § 1342(b)(1)(C)(iii); see § 1342(a)(3); *see also* 40 C.F.R. § 122.64.

revocation and reissuance, or termination. (40 C.F.R. § 124.5). This section allows an application to be made by "any interested person" to which the Director may respond. (40 C.F.R. § 124.5(b)). Section 124.5 directs that the agency follow the § 124.6 permitting process if modification, etc., is planned to be approved, *i.e.*, it states that if the Director tentatively determines to modify, etc., the permit, he shall prepare a draft permit under Section 124.6 or a notice of intent to terminate (40 C.F.R. §§ 124.5(c), 124.5(d)). Such draft shall follow the established procedure for review and issuance of a final permit. Further, a notice of intent to terminate is "a type of draft permit which follows the same procedures as any draft permit prepared under 124.6 of this chapter." (40 C.F.R. § 124.5(d)).

44. The validity of the NPDES permit for Outfall 051 should be reviewed under the present administrative process, because the RLWTF is an important component of LANL and receives waste from numerous sources within LANL. The availability of the RCRA wastewater treatment unit exemption and the availability of the definitional exemption from RCRA are important issues. They call for a decision based upon consideration of a single uncontradicted fact: Outfall 051 is not used to discharge any pollutants or, indeed, any liquid at all.

45. Legally and factually, the NPDES permit for Outfall 051 must be terminated. Because there is no basis for permitting Outfall 051 under the CWA, the RLWTF is subject to regulation under RCRA and, as New Mexico is a delegation state, under the New Mexico Hazardous Waste Act.

III. CONCLUSION AND REQUESTED RELIEF.

Petitioner contends that the foregoing facts and law conclusively require EPA, Region 6, to terminate permit NM 0028355 with respect to Outfall 051 due to lack of discharge.

WHEREFORE, Petitioner respectfully requests that the EPA grant this Petition and enter an order terminating NPDES permit NM 0028355 with respect to Outfall 051.

DATED: at Santa Fe, New Mexico, this 17th day of June, 2016.

Respectfully submitted,

CONCERNED CITIZENS FOR NUCLEAR SAFETY

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CERTIFICATION OF SERVICE

By our signatures above, we, Lindsay Lovejoy and Jonathan Block, hereby certify that on this day we mailed, U.S. Postal Service First Class postage pre-paid, copies of the foregoing Application with attachments to the Director of the Los Alamos National Laboratory, and the U.S. Department of Energy Los Alamos Field Office Manager:

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CONCERNED CITIZENS FOR NUCLEAR SAFETY EXHIBIT LIST

A. "Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility," Moss et al. (1998).

B. Letter, Hanson and Rae to Bustamante (Sept. 3, 1998).

C. Letter, Erikson and Baca to Coleman (March 18, 1999).

D. Letter, Rae to Coleman (Dec. 22, 1999).

E. Letter, Rae to Coleman (June 13, 2000).

F. Letter, Yanicak to Coghlan (CCNS) (May 12, 1999).

G. Letter, Rae to Coleman (Oct. 22, 2001).

H. Letter, Rae to Coleman (Jan. 31, 2002).

I. Letter, Rae to Coleman (May 7, 2002).

J. Letter, Rae to Coleman (Nov. 27, 2002).

K. Letter, Rae to Strickley (Apr. 18, 2003).

L. Letter, Grieggs to Hall (May 14, 2007).

M. Letter, Grieggs to Hall (May 6, 2008).

N. Letter, Grieggs and Turner to Hall (June 3, 2010).

O. Letter, Grieggs and Turner to Hall (Aug. 19, 2010).

P. Letter, Grieggs and Turner to Hall (Sept. 16, 2010).

Q. Letter, Grieggs and Turner to Hall (Dec. 9, 2010).

R. Letter, Grieggs and Turner to Simmons (Feb. 23, 2011).

S. Letter, Grieggs and Turner to Chen (Feb. 23, 2011).

T. Letter, Grieggs and Turner to Branning (Sept. 28, 2011).

U. Letter, Grieggs and Turner to Branning (Nov. 16, 2011).

V. Letter, Dorries and Turner to Schoeppner (July 25, 2013) (*diagrams omitted*).

W. Letter, Dorries and Smith to Hosch (Jan. 27, 2012), with attached excerpts from February 2012 Los Alamos National Laboratory, NPDES Permit No. NM0028355, 2012 NPDES Permit Re-Application, concerning Outfall 051, and Form 2C, showing no discharge from Outfall 051 after November 2010.

X. Los Alamos National Laboratory, NPDES Permit No. NM0028355, 1998 NPDES Permit Re-Application (May 1998).

Y. Letter, LANL to Saums, with Response to NMED-SWQB Review Comments, at 9-10 (Mar. 10, 1999).

Z. Letter, Rae to Hathaway with attached Benchmark Environmental report (Mar. 18, 1999).

AA. NPDES Permit No. NM0028355 Fact Sheet (Oct. 18, 1999).

BB. Letter, Gurulé to Hathaway (Nov. 25, 1998).

CC. Letter, Erickson to Hathaway (Oct. 26, 1999).

DD. LANL Comments on EPA Preliminary Draft NPDES Permit (Mar. 17, 2005).

EE. LANL NPDES Permit No. NM0028355 Comments on Draft Permit (Mar. 30, 2006).

FF. Letter, Lane to Wilmot, with attached NPDES Permit No. NM0028355 (July 17, 2007).

GG. Letter, Saums to Rae (Feb. 2, 1999).

HH. Letter, Ferguson to Gurulé (Oct. 13, 1999).

II. Letter, Yanicak to Casalina (June 2, 2011).

JJ. Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory (2008) (excerpts).

KK. Letter, Grieggs to Hall (May 14, 2007).

LL. Record of Decision, Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, 73 Fed. Reg. 55833 (Sept. 26, 2008).

MM. Record of Decision, Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory,74 Fed. Reg. 33232 (July 10, 2009).

NN. NPDES Permit No. NM0028355 Fact Sheet for the NPDES Permit to Discharge to Waters of the United States (June 26, 2013).

OO. Los Alamos National Laboratory, NPDES Permit No. NM0028355, Comments on Draft NPDES Permit Issued June 29, 2013 (Aug. 13, 2013).

PP. Isotopic evidence for reduction of anthropogenic hexavalent chromium in Los Alamos National Laboratory groundwater, 373 Chemical Geology 1 (May 12, 2014).

QQ. Letter, Yurdin to Dories with Inspection Report (Aug. 5, 2014).

RR. LANL web site, NPDES Industrial Permit Outfall Locations, http://www.lanl.gov/environment/protection/compliance/industrial-permit/index.php (reviewed on June 17, 2016).

SS. Letter, Honker to Dorries, with Response to Comments and Authorization to Discharge under the National Pollutant Discharge Elimination System (Aug. 12, 2014).

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UU. Letter, S. Dwyer to L. Lovejoy (Dec. 18, 2015).

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Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility

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EXECUTIVE SUMMARY

Determining viable options for eliminating the discharge of treated radioactive liquid waste to Mortandad Canyon was the directive of the outfall 051 elimination working group. It may no longer be in the best interests of Los Alamos National Laboratory (LANL) to continue using this outfall. Incentives for eliminating outfall 051, regulatory and technical issues involved, and recommended steps to accomplish this goal are presented in this report.

Treatment processes used at the Radioactive Liquid Waste Treatment Facility (RLWTF) at Technical Area -50 (TA-50) presently remove radioactive and other contaminants from 18–20 million L of radioactive wastewater per year. The liquid effluent is discharged to Effluent Canyon where it flows a short distance before entering Mortandad Canyon. Over 1.3 billion L have been treated and discharged since the RLWTF was commissioned in 1963.

The existing facility currently uses a precipitation and filtering process for removal of radioactive materials. Radioactive nuclides discharged in waters are regulated by Department of Energy (DOE) Order 5400.5. The existing precipitation technique does not produce water of a quality that can meet this Order. The Phase I upgrade being installed at the RLWTF addresses this problem by using tubular ultrafiltration (TUF) and reverse osmosis (RO) units instead of precipitation. A permeate (product) and a reject (concentrate) stream are produced from the TUF and RO. The permeate stream will meet DOE 5400.5 requirements. Additionally, the New Mexico Environment Department (NMED) has required that LANL discharges to Mortandad Canyon meet all State of New Mexico ground water standards. The effluent from the TA-50 plant does not consistently meet state ground water standards for nitrate, fluoride, and total dissolved solids. The Phase II upgrade addresses the nitrates with a biosystem that will convert the entrained nitrates in the water to nitrogen gas. The Phase I upgrade will take care of the fluoride and total dissolved solids concerns.

Treatment parameters for the Phase I and II upgrades, which were presented in the 95% Conceptual Design Report (CDR), are used in this study. The treatment parameters gained from the optimized Phase I and II upgrades, along with the additional recommendations by this working group, should be used in the design of the new radioactive liquid waste treatment facility. Some recommendations made in this report are not included in the CDR and need DOE approvals. Successful implementation of the Phase I and Phase II upgrades at the RLWTF, and the future construction of a new radioactive

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liquid waste treatment facility designed to meet the needs of LANL for the next 30 years are fundamental to the recommendations proposed in this report.

Options considered by the working group for eliminating liquid discharge to outfall 051 are:

1. redirect the treated liquid flow to another discharge point,

2. further treatment and reuse/recycle of the RLWTF effluent, and

3. further treatment and subsequent evaporation of RLWTF effluent.

Evaluation criteria for each option included environmental protection, regulatory compliance, public perception, institutional requirements, corporate excellence and sustainability, technical feasibility, and economic feasibility.

The working group recommends a combination of options two and three that will begin a phased transition toward zero liquid discharge to Mortandad Canyon. Each phase of effort will result in improvements to environmental water quality and will increase stakeholders' confidence in the Laboratory's commitment to environmental stewardship. Zero liquid discharge to Mortandad Canyon will help alleviate public concern regarding the transport of contaminants into and from Mortandad Canyon. Three design and construction phases over the next five years are recommended to maintain the course toward zero liquid discharge.

Phase III deals with the reduction of tritiated wastewaters from the RLWTF influent to less than 20 000 pCi/L, which is the drinking water standard. The segregation and evaporation of Tritium Systems Test Assembly (TSTA) tritiated wastewater would be a step toward reducing tritium to that level. It would also allow decommissioning the cross-country transfer pipeline from TA-21-257 to TA-50-2. Also included in Phase III is the identification and minimization of other radioactive and hazardous constituents and the reduction of flow volumes into the RLWTF. Improved administration and monitoring of waste acceptance criteria (WAC) influent limits are proposed. During this phase, after biodenitrification and ferric hydroxide precipitation treatment, the RO concentrate waste stream will be commingled with the RO permeate and discharged at outfall 051.

Phase IV includes further treatment of the RO concentrate to separate solid and liquid phases. The solids will be removed and packaged for disposal at TA-54. The treated RO concentrate will be mixed with the RO permeate and the combined volume discharged at outfall 051. This additional treatment will further improve effluent quality and prepare the way for industrial reuse of effluent.

Phase V includes the design and construction of an evaporative process(es) that will result in zero liquid discharge to the environment. Productive reuse of the purified water stream to the extent practical is recommended. Evaporative processes were also studied to eliminate the discharge of liquid to Mortandad Canyon and conceptual level recommendations are presented to accomplish this goal.

The working group studied the alternative of discharging treated radioactive liquid waste to the Sanitary Wastewater Systems Consolidation (SWSC) plant as a means of obtaining zero discharge from the RLWTF outfall into Mortandad Canyon. Assuming all regulatory approvals could be obtained, the working group concluded that it would be unwise to mix treated radioactive liquid waste and sanitary wastewater at LANL. This conclusion was reached because of potential contamination of other canyons and facilities, regulatory issues, and public perception concerns.

In summary, the working group advises the Laboratory to set a course toward zero liquid discharge of treated radioactive liquid waste. In pursuit of this goal, the following action steps are advised:

1. complete and optimize the Phase I and Phase II upgrades at the present RLWTF,
2. design, fund, and construct a modern treatment facility with capability to treat LANL's radioactive liquid waste for the next 30 years,
3. initiate Phase III upgrade to segregate tritiated wastes from the RLWTF influent and to identify and minimize radioactive and hazardous wastes and flow volumes to the RLWTF as feasible,
4. undertake Phase IV upgrade to remove dissolved solids from the RO concentrate stream, and
5. begin Phase V upgrade to design and construct an evaporative process that will reuse or evaporate treated radioactive liquid waste and result in zero liquid discharge to the environment.

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ELIMINATION OF LIQUID DISCHARGE TO THE ENVIRONMENT FROM THE TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

by

David Moss, Neil Williams, Deb Hall, Ken Hargis, Mike Saladen, Mort Sanders, Stewart Voit, Pete Worland, and Steve Yarbro

ABSTRACT

Alternatives were evaluated for management of treated radioactive liquid waste from the radioactive liquid waste treatment facility (RLWTF) at Los Alamos National Laboratory. The alternatives included continued discharge into Mortandad Canyon, diversion to the sanitary wastewater treatment facility and discharge of its effluent to Sandia Canyon or Cañada del Buey, and zero liquid discharge. Implementation of a zero liquid discharge system is recommended in addition to two phases of upgrades currently under way. Three additional phases of upgrades to the present radioactive liquid waste system are proposed to accomplish zero liquid discharge. The first phase involves minimization of liquid waste generation, along with improved characterization and monitoring of the remaining liquid waste. The second phase removes dissolved salts from the reverse osmosis concentrate stream to yield a higher effluent quality. In the final phase, the high-quality effluent is reused for industrial purposes within the Laboratory or evaporated. Completion of these three phases will result in zero discharge of treated radioactive liquid wastewater from the RLWTF.

INTRODUCTION

Problem Statement

Defining viable steps for eliminating the discharge of treated radioactive liquid waste into Mortandad Canyon at Los Alamos National Laboratory (LANL) is the ultimate goal of the outfall 051 elimination working group's recommendations. The working group was established in October 1997, by the group leaders of Environmental Management/Radioactive Liquid Waste (EM-RLW) and Water Quality and Hydrology (ESH-18).

The liquid effluent from the Radioactive Liquid Waste Treatment Facility (RLWTF) contains constituents that are regulated by federal and state laws, US Department of Energy

(DOE) orders, and Pueblo standards. To meet these increasingly more stringent discharge requirements, LANL is presently installing new processes at the Technical Area 50 (TA-50) RLWTF.

This report defines a path that leads to zero liquid discharge of treated radioactive liquid waste to outfall 051. These recommendations encompass a broad spectrum of radioactive liquid waste management efforts involving waste characterization, liquid waste volume reduction, source minimization of regulated constituents, reuse and recycle, evaporation technologies, and the placement of constituents in their most environmentally benign state.

Evaluation Criteria

Evaluation of various alternatives studied to eliminate the RLWTF discharge was based on the following criteria:

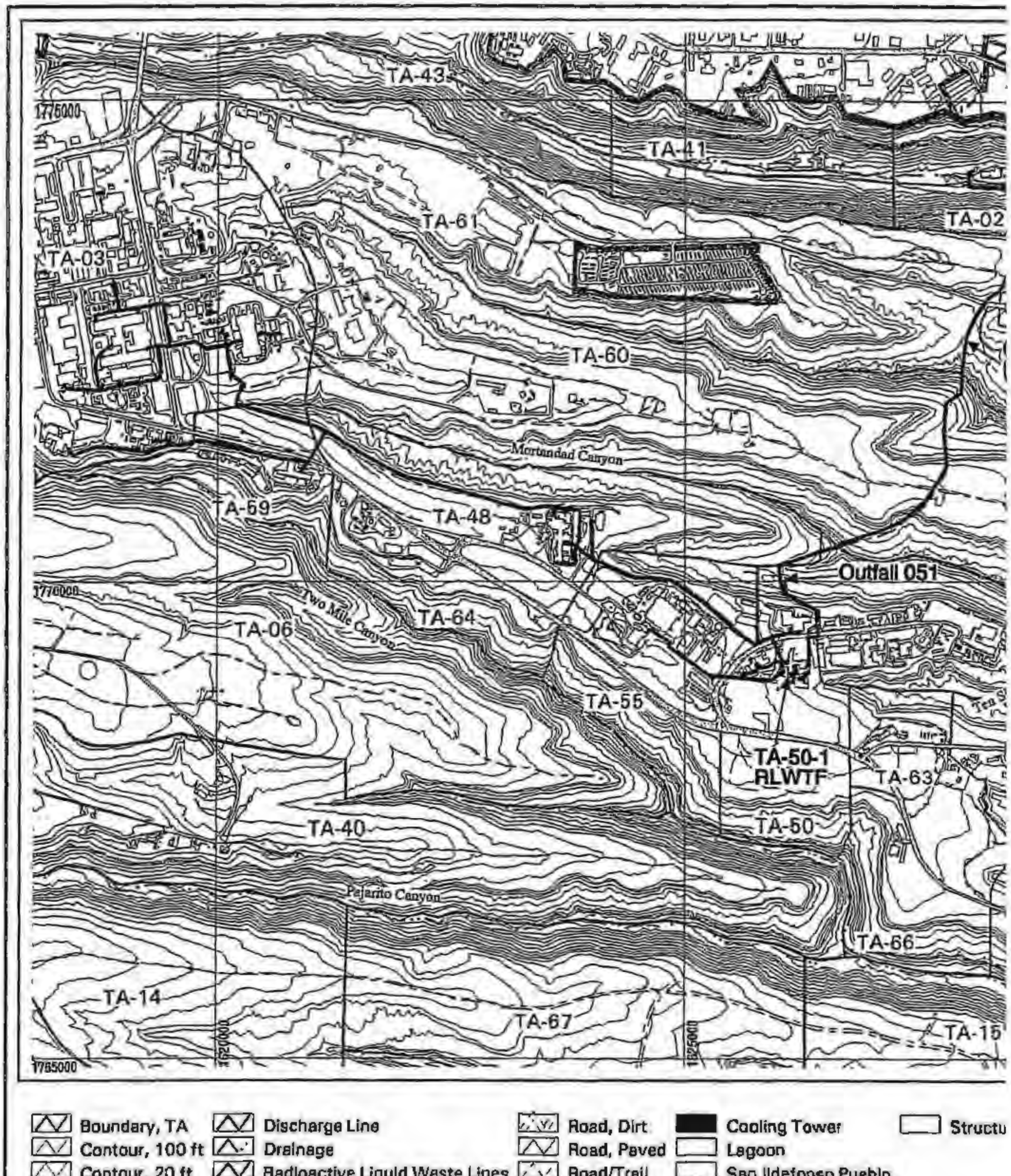
1. ability to provide for long-term protection of the environment,
2. ability to meet regulatory compliance requirements and prevent future legal liability,
3. ability to satisfy public concerns and perceptions,
4. ability to meet institutional requirements with minimal impact,
5. ability to support goals of corporate excellence and sustainability,
6. technical feasibility, and
7. economic feasibility.

ENVIRONMENTAL AND REGULATORY ISSUES

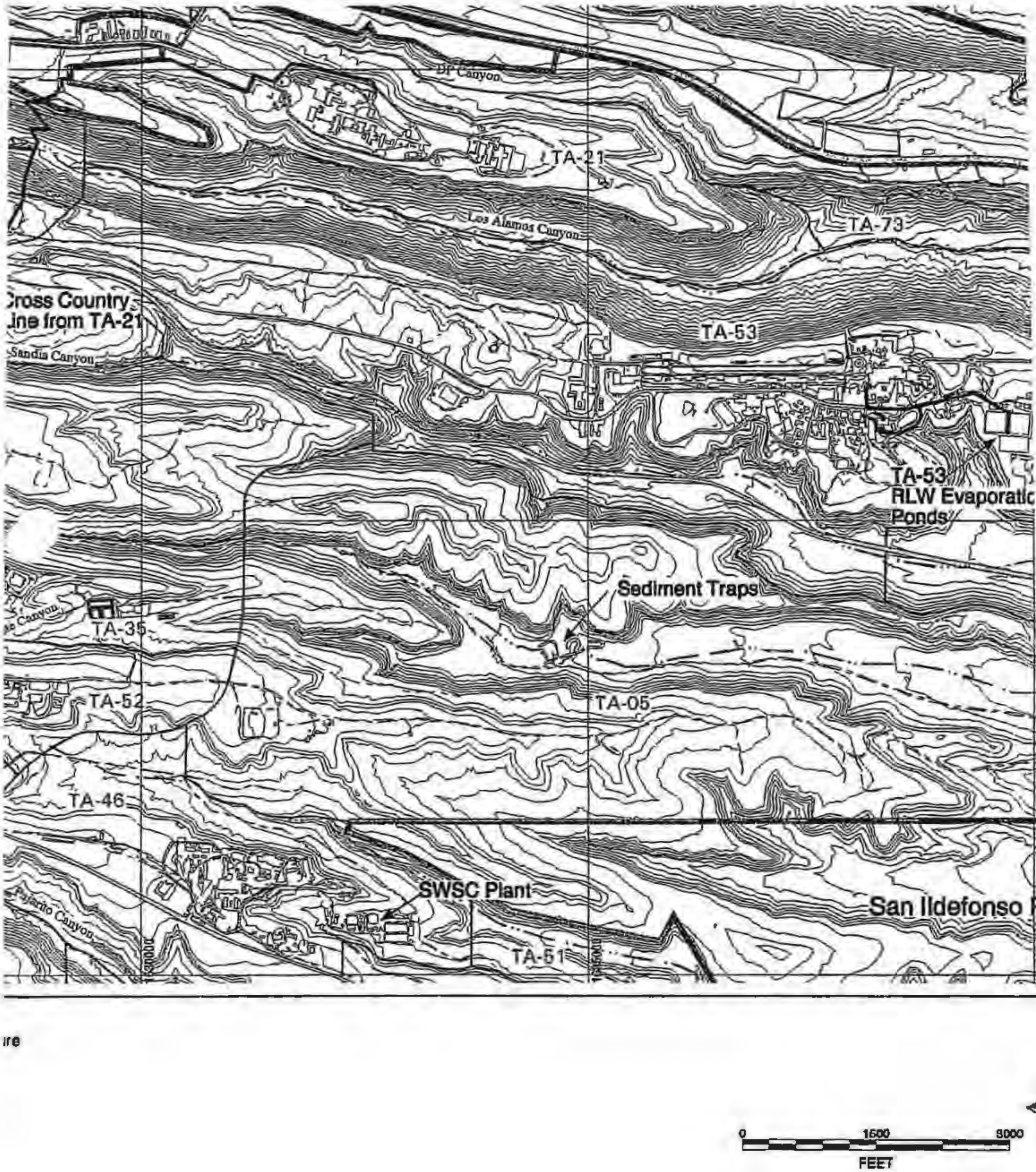
Hydrologic Setting of Mortandad Canyon

Mortandad Canyon is an east to southeast-trending canyon that heads on the western part of the Pajarito Plateau and is tributary to the Rio Grande to the east. The canyon contains a shallow body of ground water recharged by industrial effluent from the RLWTF, other smaller effluent flows, and storm water runoff (see Map 1). The spatial extent of this saturation is within the Laboratory boundaries, extending from near the RLWTF outfall on the west to approximately one mile above the boundary between the Laboratory and San Ildefonso Pueblo.

The greatest potential for the surface transport of contaminants from the RLWTF is with storm runoff, either in solution or adsorbed on sediments. Because of Mortandad Canyon's small drainage area, the presence of sediment traps constructed by the Laboratory, and the large volume of unsaturated alluvium, there has been no record of surface runoff off Laboratory property since hydrologic observations began in 1960.



MAP 1
Radioactive Liquid Waste Collection System



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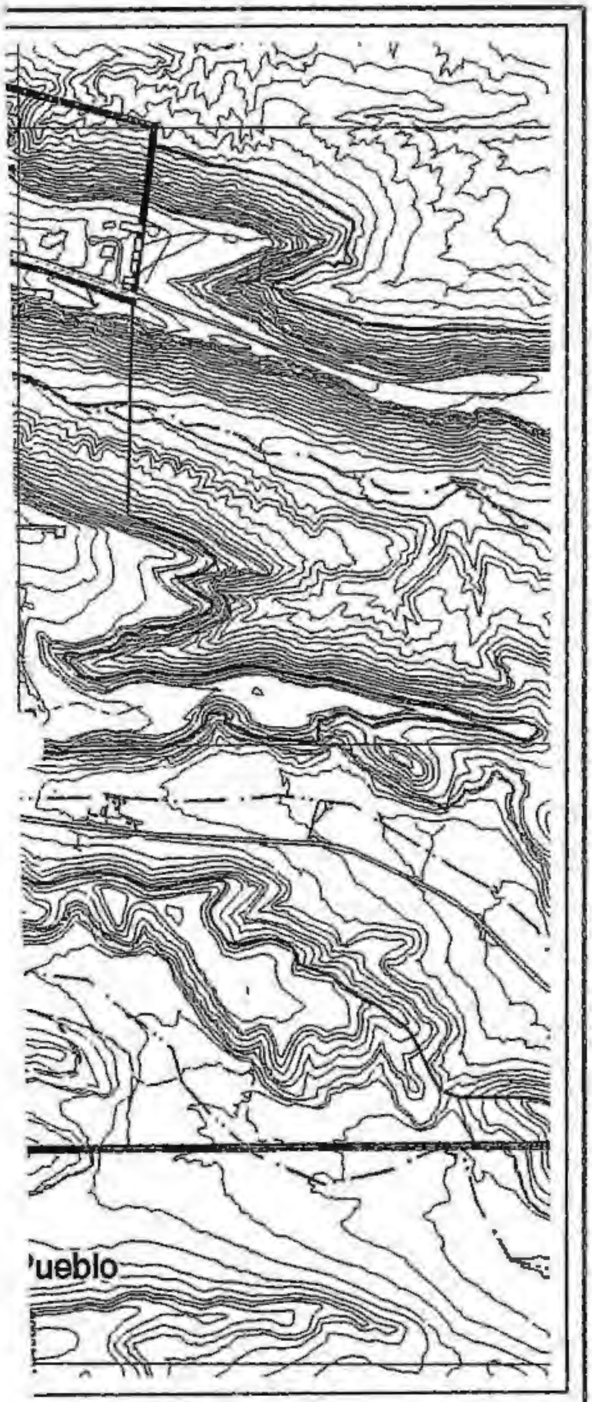

by 'Marcia Jones' Date: June 02, 1998

Recharge by industrial effluents, principally from the RLWTF, occurs in the upper canyon. Storm runoff recharge is roughly equal to the effluent input volume on an annual basis. The volume of recharge since 1960 has not been sufficient to significantly change the volume of the shallow ground water.

Discharge Quality

Since the existing RLWTF treatment process was designed in the early 1960s for radionuclide removal, the facility's current effluent quality does not routinely meet all of the New Mexico Water Quality Control Commission (NMWQCC) ground water standards adopted in 1977. National Pollutant Discharge Elimination System (NPDES) compliance and RLWTF operational data show that the RLWTF treated effluent has consistently exceeded NMWQCC ground water standards for fluoride and nitrate, and occasionally exceeded the standards for cyanide, total dissolved solids (TDS), and pH.

DOE Order 5400.5 regulates the discharge of radioactive constituents from outfall 051 into Mortandad Canyon. Six radionuclides exceeded their respective derived concentration guideline (DCG) values in the RLWTF effluent during calendar years 1990 through 1996: ^{90}Sr, ^{137}Cs, ^{238}Pu, ^{239}Pu, ^{240}Pu, and ^{241}Am. The nuclides ^{90}Sr and ^{137}Cs exceeded their DCG values only in 1991. DCG values for ^{238}Pu were exceeded in 1994 through 1996. Plutonium-239 and ^{240}Pu exceeded their DCG levels in 1991 and 1995. DCG levels for ^{241}Am were exceeded each year from 1990 through 1996.

Groundwater Quality

Routine environmental monitoring has been conducted in Mortandad Canyon since 1960. The routine monitoring program includes regular collection and analysis of surface water, sediments, shallow alluvial, and main aquifer ground water samples from the canyon. The Environmental Surveillance Report at Los Alamos (1996) contains data on samples collected in Mortandad Canyon.

As RLWTF effluents are released into the canyon and move downgradient, radionuclides (except tritium) and some inorganic chemicals are adsorbed or bound to the bed sediments, reducing the amount of radionuclides or chemicals in the water or effluents. A high buildup of radionuclides or chemicals does not occur in the alluvium at the effluent outfall because periodic storm runoff transports sediments and contaminants down the channel in the canyon. Adsorption of contaminants reduces the concentrations in the perched ground water.

Nonradioactive Contaminants

RLWTF effluent quality has a significant influence on the quality of the shallow ground water. The perched alluvium ground water contains a number of inorganic constituents listed in the NMWQCC 3103 Ground Water Standards. TDS concentrations typically range from 300–600 mg/L.

A comparison of alluvial monitor well data with the NMWQCC nitrate standard shows that the alluvial ground water has consistently exceeded the standard of 10 mg/L for nitrate nitrogen. While high concentrations of nitrate nitrogen have been present as recently as 1994, (61 mg/L of nitrate nitrogen at monitor well MCO-7), the current trend is downward. In 1995 shallow alluvial monitor wells averaged about 15 mg/L as nitrate nitrogen. The current downward trend reflects both reductions in nitrates discharged to the RLWTF by programmatic activities over the recent past and attenuation within the natural canyon system. Purtymun (1977) determined that the loss of nitrates within the shallow ground water could be attributed to uptake by plants, adsorption onto alluvial material, and infiltration into underlying tuff.

A 1994 sampling of Test Well 8, a main aquifer-monitoring well in Mortandad Canyon, showed a nitrate as nitrogen value of 5.1 mg/L, while all other values since 1988 were 0.2 mg/L or less. The 1994 result could be an anomaly or it could represent evidence of actual nitrate contamination migrating from the shallow Mortandad alluvial ground water into the deeper main aquifer.

Beside nitrate, only one parameter, fluoride, has consistently exceeded NMWQCC ground water standards in the alluvium. There is currently a downward trend in fluoride concentrations in the alluvial ground water. Research by Purtymun (1977) indicates that once the concentrations of nitrates and fluorides in the RLWTF effluent are reduced or eliminated, then concentrations of those contaminants in the alluvial ground water will naturally decline due to the relatively rapid turnover of water and chemicals in storage. Comparing chemical concentrations in yearly effluent samples and ground water samples shows that ground water concentrations are about 30–50% of effluent concentrations. Purtymun (1977) concluded that, with regard to these mobile inorganic chemicals, "The rapid loss of water and its associated chemicals from the aquifer prevents chemical accumulation and indicates that cessation of effluent release to the canyon would rapidly improve the quality of water in the aquifer."

Cyanide and TDS have, on occasion, been discharged by the RLWTF at concentrations greater than NMWQCC ground water standards, but recent (1990–1995) monitoring data does not show elevated concentrations in the alluvial ground water. The New Mexico Water Quality Control Commission #3103 Standards are shown in Table 1.

Table 1. New Mexico Water Quality Control Commission Standards

Parameter	(mg/L)
Al	5.0
As	0.1
Ba	1.0
B	0.75
Cd	0.01
Cl	250
Cr	0.05
Co	0.05
Chemical oxygen demand (COD)	NA
Cu	1.0
CN	0.2
Fluoride	1.6
Fe	1.0
Pb	0.05
Hg	0.002
Ni	0.20
NH_3-N	NA
Nitrate-N	10.0
Nitrite-N	NA
N (total)	NA
NO_3–NO_2	NA
pH	6 to 9
$^{226,228}Ra$	30 pCi/L
Se	0.05
Ag	0.05
Sulfate	600
Total dissolved solids	1000
Total suspended solids (TSS)	NA
Total toxic organics (TTO)	NA
U	5.0
Zn	10.0

No organic chemical constituents (listed in the Resource Conservation and Recovery Act [RCRA] Appendix IX) have been identified in the alluvial ground water (Purtymun, 1988). Similarly, no cores taken in or beneath the alluvium to depths of approximately 100 ft showed any detectable organic chemical (volatiles, semivolatiles, herbicides, pesticides, or polychlorinated biphenyls [PCBs]) contaminants (Stoker et al., 1991).

Radioactive Contaminants

The main radioactive contaminants of concern in the Mortandad system include tritium, cesium, strontium, americium, and plutonium. Most of the radioactive residuals from the RLWTF effluents are removed from the water phase within a short distance of the outfall by adsorption onto sediments, in or immediately adjacent to, the stream channel. Aqueous concentrations are also highest near the RLWTF outfall. The levels of ^{90}Sr and gross alpha and gross beta contamination exceed Environmental Protection Agency (EPA) drinking water standards in many of the monitoring wells. In some years the levels of contamination (except for tritium) exceed DOE DCGs for a drinking water system but do not exceed the DCGs for ingestion of environmental water. The derived concentration guidelines for radioactive contaminants as stated in DOE Order 5400.5 are shown in Table 2.

Recent data indicates variable movement of contaminants into the unsaturated tuff beneath the saturated portion of the alluvium. Some boreholes showed migration of tritium, nitrate, and chloride to depths of at least 195 ft.

Except for tritium, radioactive constituents have apparently moved less than 10 ft in the unsaturated zone, based on analysis of cores from two on-site core holes (Stoker et al., 1991). However, more recent work by the Laboratory's Environmental Systems and Waste Characterization group, CST-7, has indicated that metallic radioactive contaminants may be more mobile in saturated alluvium than previously thought. The metallic radionuclides have been observed to travel in ground water sorbed onto colloid particles. The source and composition of the colloidal particles is not well defined yet, but some may originate as a byproduct of the coprecipitation process involving ferric sulfate and lime used at the RLWTF. Colloid density in the RLWTF effluent may be on the order of tens of millions of particles per milliliter (Longmire, 1997).

In 1993 trace levels (89 pCi/L) of tritium, as tritiated water, were detected in the main aquifer beneath Mortandad Canyon in Test Well 8. These levels are less than 1% of the EPA drinking water maximum contaminant level (MCL) of 20 000 pCi/L. Nonetheless, the levels are significant because they are indicative of recharge from the surface within the past four decades. Tritium is of great interest in evaluating the hydrologic process because tritium, the radioactive isotope of hydrogen, is chemically part of the water molecule and moves with water virtually unaffected by any geochemical processes such as ion exchange, chelation, or adsorption. Accordingly, it can be used as a fundamental conservative tracer to follow the movement of water.

The confirmed movement of water and tritium from the shallow zones to the deep aquifer during the period of LANL operations raises the possibility of ongoing migration of other LANL contaminants into the main aquifer. The present main aquifer monitoring well network is considered inadequate to detect the presence of very low-level radioactive contamination at the surface of the main aquifer. The results of the ongoing Monitor Well Installation Project will provide a much more detailed picture of the extent and movement of contaminants in the Mortandad system.

Table 2. Department of Energy Standards for Radionuclides in Water (DOE Order 5400.5)

Constituent	Uncontrolled Area (pCi/L)	Drinking Water (pCi/L)
^{3}H	2 000 000	80 000
^{7}Be	1 000 000	40 000
^{89}Sr	20 000	800
^{90}Sr	1 000	40
^{137}Cs	3 000	120
^{234}U	500	20
^{235}U	600	24
^{238}U	600	24
^{238}Pu	40	1.6
^{239}Pu	30	1.2
^{240}Pu	30	1.2
^{241}Am	30	1.2

Summary of Regulatory Issues

The following is not a complete summary of environmental regulatory issues facing the RLWTF. Nor is it even a listing of all potential environmental issues affecting implementation of zero discharge. The following text is intended to identify water-related regulatory issues that influenced the working group's recommendations.

Discharges of wastewater from Laboratory facilities are regulated under a complicated system of state and federal laws and regulations that involve a number of permits administered by different state and federal agencies. The regulation and management of radioactive constituents covered under the Atomic Energy Act is delegated to DOE. All other constituents, including some other radionuclides, are regulated by the EPA and the State of New Mexico Environment Department (NMED). Under the Clean Water Act (CWA) amendments of 1987, San Ildefonso Pueblo has the same potential authority to set stream standards as the State of New Mexico.

Clean Water Act

The primary goal of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's water. The CWA established the NPDES Program that requires permitting of point-source discharges to the nation's water. The Laboratory's RLWTF is permitted to discharge industrial/radioactive wastewater into Mortandad Canyon through NPDES outfall 051. The RLWTF has consistently met NPDES permit limits with a few exceptions.

Under the authority reserved to EPA and the states by the CWA, the Laboratory's NPDES permit contains effluent limits for ^{226}Ra, ^{228}Ra, and accelerator-produced tritium. Section 1102 G. of the New Mexico Stream Standards requires that the radioactivity of surface waters be maintained at the lowest "practicable" level. In the Laboratory's case, this should minimally be protective of the livestock watering and wildlife habitat designated use. Additionally, NMED has proposed new stream standards for domestic water supplies including: dissolved uranium 5.0 mg/L, ^{226}Ra and ^{228}Ra 5 pCi/L, ^{90}Sr 8 pCi/L, ^{3}H 20 000 pCi/L, and gross alpha (including ^{226}Ra, but excluding uranium). These stream standards could be used as guidelines for future effluent-based limits in NPDES permits. For example, the current limit for tritium would be reduced from 3 000 000 pCi/L to 20 000 pCi/L, and ^{226}Ra and ^{228}Ra may be reduced from 30 pCi/L to 5 pCi/L. NMED has indicated in previous state certifications that these standards should apply to any outfall discharging a "regulated" radionuclide, including those that discharge a mixture of regulated and nonregulated radioactive waste. Additionally, there have been several attempts by Congress recently to pass legislation to amend the CWA and make federal facilities subject to stricter policing authority over nuclear waste that pollutes water.

Use Study

In 1992 the NMED issued a conditional certification of a draft NPDES permit for the Laboratory based upon effluent limits to protect fish in the Rio Grande. The agreement also required that a study be conducted to identify the stream uses associated with watercourses in the canyons into which the Laboratory discharges NPDES-permitted wastes. The study was conducted by the US Fish & Wildlife (USF&W) Service in 1997. The USF&W is currently evaluating its findings from the study and a final report is due in late 1998. EPA and NMED may develop the Laboratory's new NPDES effluent limits based on the findings from this study.

Stream Standards

New stream standards are being developed by NMED that will impact the effluent limits contained in the Laboratory's NPDES permit. The proposed new Wildlife Habitat Standards are quite stringent, including total mercury 0.0012 µg/L, total DDT and metabolites 0.000011 µg/L, and PCBs 0.014 µg/L. In some cases, the proposed standards are below analytical detection limits or minimum quantification limits (MQLs).

San Ildefonso Pueblo

San Ildefonso Pueblo has also drafted stream standards but, to date has not applied to EPA for their approval and adoption under the CWA Amendments of 1987. Section III-I of the draft standards, Water Quality Code for the Pueblo of San Ildefonso (1991), require that "The radioactivity of surface water shall be maintained at concentrations which do not exceed the maximum natural concentrations in surface and ground waters of the Pueblo." This standard would apply to any watercourse that crosses Pueblo lands. Even though storm runoff has not been observed to cross from LANL property onto San Ildefonso property, its standards could affect the Laboratory's NPDES permit.

When San Ildefonso Pueblo finalizes its Water Quality Standard and completes all other requirements set forth in the CWA amendments of 1987, its standards will have to be considered by EPA when it reissues the LANL NPDES permit. Before EPA could reissue the NPDES permit, the Pueblo would have to certify that the permit limits would be adequate to meet the Pueblo's stream standards.

NMWQCC Regulations

The State of New Mexico Ground and Surface Water Quality Protection Regulations (20 NMAC 6.2) authorize NMED to require a discharge plan approved by the secretary of NMED. On April 3, 1996, the NMED Ground Water Bureau (GWB) notified the Laboratory that a discharge plan was required for the discharge of NMWQCC-regulated contaminants at the RLWTF. The Laboratory submitted the Ground Water Discharge Plan for Application for the TA-50 RLWTF to NMED on August 16, 1996. Since then, at the request of NMED the Laboratory has provided technical clarifications in response to NMED's questions and the NMED has proposed some revisions in sampling schedules, etc. The discharge plan application is still pending NMED approval at the time of this report.

Abatement Plan

Subpart IV, Prevention and Abatement of Water Pollution of the State of New Mexico Ground and Surface Water Quality Protection Act (20 NMAC 6.2), was developed to abate pollution of subsurface water so that ground water is either remediated or protected for use as a domestic and agricultural water supply. NMED personnel have indicated that if the ground water or surface water is contaminated above standards and the Laboratory's Environmental Restoration (ER) Project does not address the contamination, NMED can enforce the abatement regulations.

Resource Conservation and Recovery Act and Hazardous and Solid Waste Amendments

The NMED Hazardous and Radioactive Materials Bureau (HRMB) considers the RLWTF to be a low-level waste treatment facility and is aware of the new upgrades or modifications to the facility. HRMB is concerned about the potential generation of RCRA waste streams, especially any process that may generate mixed waste and mixed transuranic (TRU) waste. To alleviate this concern the Laboratory must properly characterize its waste to ensure that there is a mechanism for proper waste storage and disposal. Administrative controls, such as the Waste Acceptance Criteria (WAC), have been adopted to prohibit the discharge of some RCRA-listed hazardous waste into the radioactive liquid waste (RLW) collection system. Some hazardous wastes are allowed under certain circumstances; however, they must meet exemptions. Additional efforts are needed to administratively implement and document the effectiveness of the WAC program. Current monitoring of RLW sources to verify compliance with the WAC is limited and needs to be expanded.

Under RCRA, wastewater treatment facilities that are subject to NPDES permit limits may qualify for exemption from certain RCRA requirements, including engineering design standards. When the RLWTF implements zero liquid discharge, if the NPDES permit for Mortandad Canyon is deleted, current exemptions would not apply. RCRA-listed wastes are already administratively prohibited from the RLW waste stream. However, the potential for exposure to increased RCRA regulatory coverage with zero discharge underscores the need for better administration and documentation of compliance with WAC requirements.

The Laboratory has prepared a site-wide hydrogeologic work plan. The work plan addresses both the RCRA regulatory ground water monitoring requirements and the Hazardous and Solid Waste Amendments (HSWA) hydrogeologic permit requirements.

The work plan describes proposed ground water characterization and monitoring activities Laboratory-wide, including activities in and adjacent to Mortandad Canyon.

The Laboratory has an ongoing ER Project that is responsible for preparing RCRA Facility Investigation (RFI) task or site work plans that establish the technical approach and methodology for environmental investigations. The general purpose of the RFI investigation in Mortandad Canyon is to:

1. determine the potential for contaminant transport into or within Mortandad Canyon watersheds,
2. evaluate human health risks and ecological impacts associated with the presence of contaminants,
3. refine conceptual models for contaminant transport,
4. assess the potential for interconnections between ground water in alluvium, perched intermediate zones, and the regional aquifer, and
5. assess the projected impact that contaminants may have on off-site receptors and the Rio Grande.

DOE Regulations

The Atomic Energy Act establishes a regulatory framework by which DOE, as successor to the Atomic Energy Commission, is authorized to prescribe and enforce regulations and other requirements necessary for sound management of its activities. Under this authority DOE developed Order 5400.5 with DCGs that specify dose and concentration limits for radioactive wastewater discharges. The RLWTF currently does not meet all DOE DCGs for radioactive constituents.

EPA and State of New Mexico authority to regulate radioactive pollutants is limited. Under 40 CFR 122.2, EPA and state authority is confined to "...radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended)." This same section further notes that "...radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials. Examples of materials not covered include radium and accelerator-produced isotopes."

Other Regulatory Programs

Air Quality and National Environmental Protection Act (NEPA) Requirements

The Laboratory's Air Quality Program (managed by ESH-17) is currently under a Federal Facilities Compliance Agreement (FFCA) that may impact selected treatment options (e.g., evaporators, lagoons, etc.). Additionally, a NEPA review and an environmental assessment, or only a NEPA review, may be needed if treatment options are selected that would move the discharge into another canyon. For example, discharge into Sandia Canyon could impact the wetlands and transport potentially contaminated radioactive wastewater off DOE property. Additionally, impact to Laboratory stakeholders (Pueblos, the public, etc.) must be evaluated.

RADIOACTIVE LIQUID WASTE AT LANL

Generation and Collection

Radioactive liquid wastes from LANL facilities have been treated at the TA-50 RLWTF since 1963. During the past 35 years, nearly 1.3 billion L of treated radioactive liquid waste have been discharged to Mortandad Canyon. Table 3 summarizes the quantity of radionuclides discharged in treated wastewater from the RLWTF from 1963 through 1995 (Longmire, 1997).

Table 3. Quantity of Radionuclides Discharged to Mortandad Canyon from the RLWTF (1963–1995)

Constituent	Curies
^{241}Am	>0.146
^{238}Pu	>0.097
$^{239,240}Pu$	0.194
^{137}Cs	>2.11
^{89}Sr	>1.06
^{90}Sr	>0.469
Gross beta and gamma	>8.51
^{3}H	817

The amount of effluent discharged yearly to Mortandad Canyon from the RLWTF is shown graphically in Figure 1.

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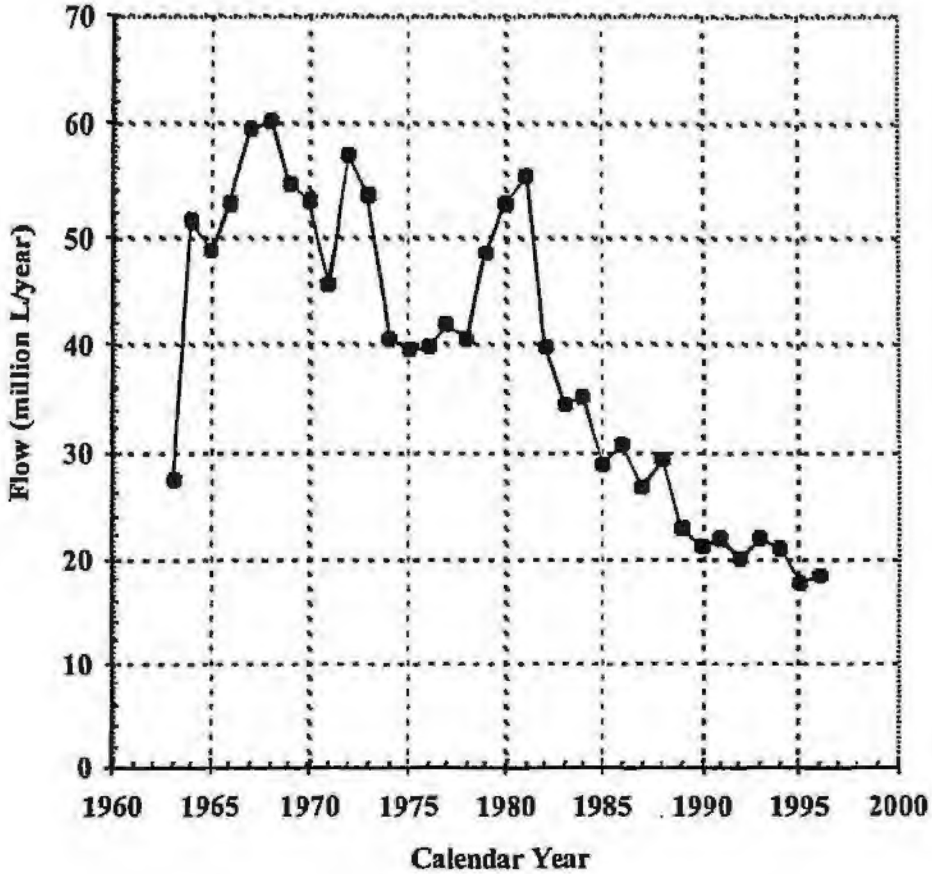

Figure 1. Treated RLWTF effluent to Mortandad Canyon (1963–1996).

Since 1981 the yearly flows have continued to decrease. However, the flows have not decreased significantly during the past five years. The flow is expected to increase, maybe as much as 50%, when the Chemistry, Metallurgy, and Research (CMR) Building becomes fully operational. Flows will also increase when the dual-axis radiographic hydrotest (DARHT) experiments start and when operations at TA-55 increase because of additional mission requirements. The present 20 million L/year influent volume may increase to 30 million L/year over the next few years. Historical data shows that the quantity of waste, as defined in the Influent Design Basis Report (Resource Technologies Group, 1995) is 15.6 million L/year. This is less than the present yearly volume treated at the RLWTF (see Figure 1) and about one-half the estimated level when the CMR Building becomes fully operational. Also, the Influent Design Basis Report does not consider the 20% recirculation rate that may be necessary with the new membrane processes and the additional processes required to obtain zero liquid discharge. The working group would advise that the design influent flow be increased to at least 30 million L/year. This added treatment capacity will accommodate the following factors:

1. seasonal variations (e.g., high flows during the summer when there are many temporary summer workers),
2. the increased flow when the CMR Building becomes fully operational,
3. increased mission requirements at TA-55, and
4. the volume recycled internally as part of new treatment processes

During calendar year 1993, an estimate was made of the relative percentage of radioactive liquid waste influent attributed to various generators at LANL. The result of this estimate is shown in Figure 2. These numbers reveal that in 1993 the four largest generators of radioactive liquid waste accounted for 78% of the volume. These generators are: the CMR Building (TA-3-29), the Plutonium Facility (TA-55), the Radiochemistry Site (TA-48), and the Sigma Building (TA-3-66). The information shown in Figure 2 is not presently valid because the CMR Building has been undergoing renovation and the missions served by the collection system have changed. Figure 2 also shows the large number of facilities served and the Laboratory-wide possible impact that failure of the RLWTF would have on critical LANL defense missions. Although the flow volume from the Plutonium Facility was only 15% during 1993, it was then and is today by far the major source of the actinide activity in the RLWTF influent. The contaminants present in the influent stream to the RLWTF have never been predictable. They fluctuate depending on changes in the Laboratory mission and which generator is discharging to the collection system at any given moment.

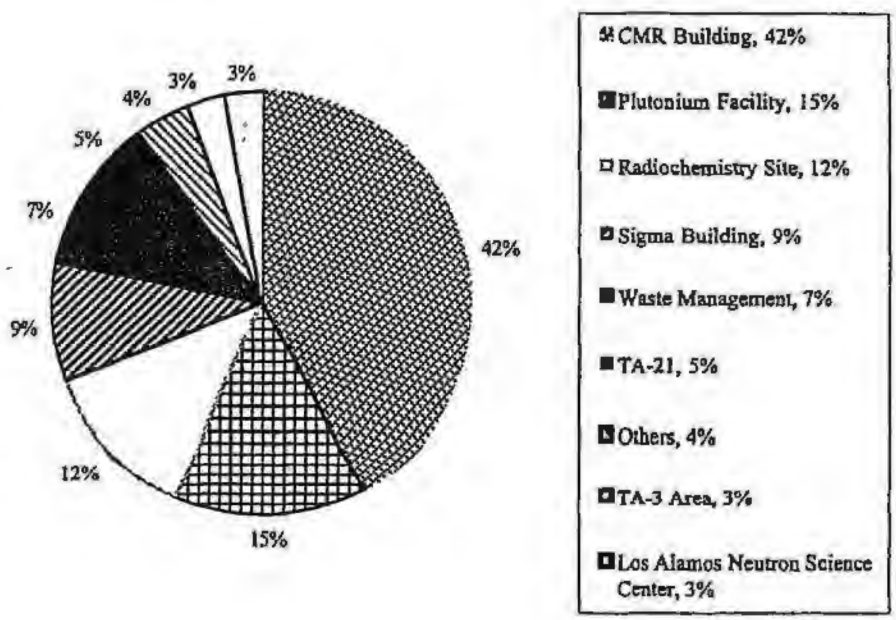

Figure 2. Percentage of liquid waste volume sent to RLWTF by generators in calendar year 1993.

Tritium concentrations in the RLWTF effluent stream are almost equal to the concentration in the RLWTF influent. The concentration in the effluent is less only because of the slightly greater effluent volume; no tritium is removed in the treatment processes. Figure 3 shows the tritium discharges in Curies per year from the RLWTF to Mortandad Canyon from 1980 through 1996. The solid and dashed lines that bound the Curies per year lines represent the discharges calculated to meet the 3.0 µCi/L NPDES limit and the 0.02 µCi/L drinking water limit. During this time period the tritium discharges decreased from a maximum of approximately 100 Ci/year to less than 1 Ci/year . Most tritium-contaminated waste enters the RLWTF from the Tritium Systems Test Assembly (TSTA) Facility through the TA-21 Radioactive Liquid Waste Treatment Plant (RLWTP). The contribution from this source is plotted from 1991 in Figure 3. The data shows that current tritium concentrations in the RLWTF effluent are near the 0.02 μCi/L level. Similar plots of ^{241}Am, ^{238}Pu, $^{239,240}Pu$ activities in RLWTF effluent from 1980 through 1996 are shown in Figures 4, 5, and 6.

Most radioactive liquid waste is transported to the RLWTF through the radioactive liquidwaste collection system (RLWCS), a gravity flow pipeline. This collection system is shown on Map 1. The main pipeline branches to approximately six technical areas and is eventually connected to over 1 600 sinks and drains within those facilities. The collection system was replaced in 1980 with a double-encased polyethylene pipe to meet waste compatibility and secondary containment issues. The collection system is continuously monitored for breach of containment and consists of conductivity monitors and leak detection devices located within manholes along the collection system. No breach of containment has been detected in the double-encased pipeline.

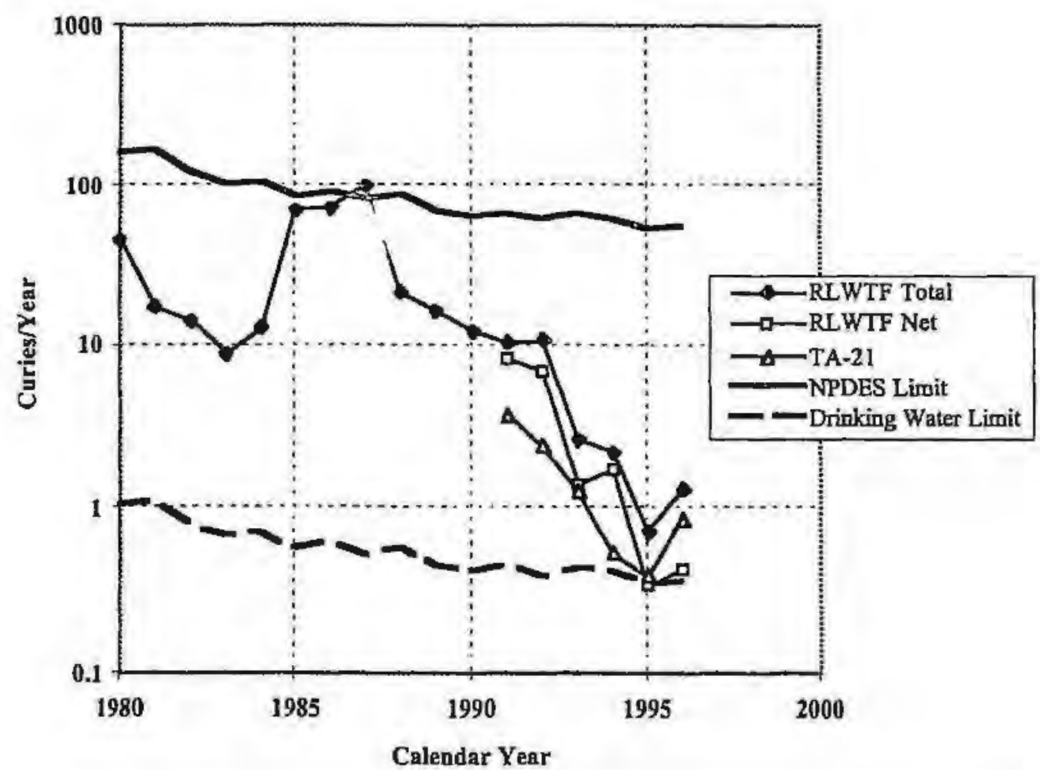

Figure 3. Tritium discharges from the RLWTF, sources and regulatory limits.

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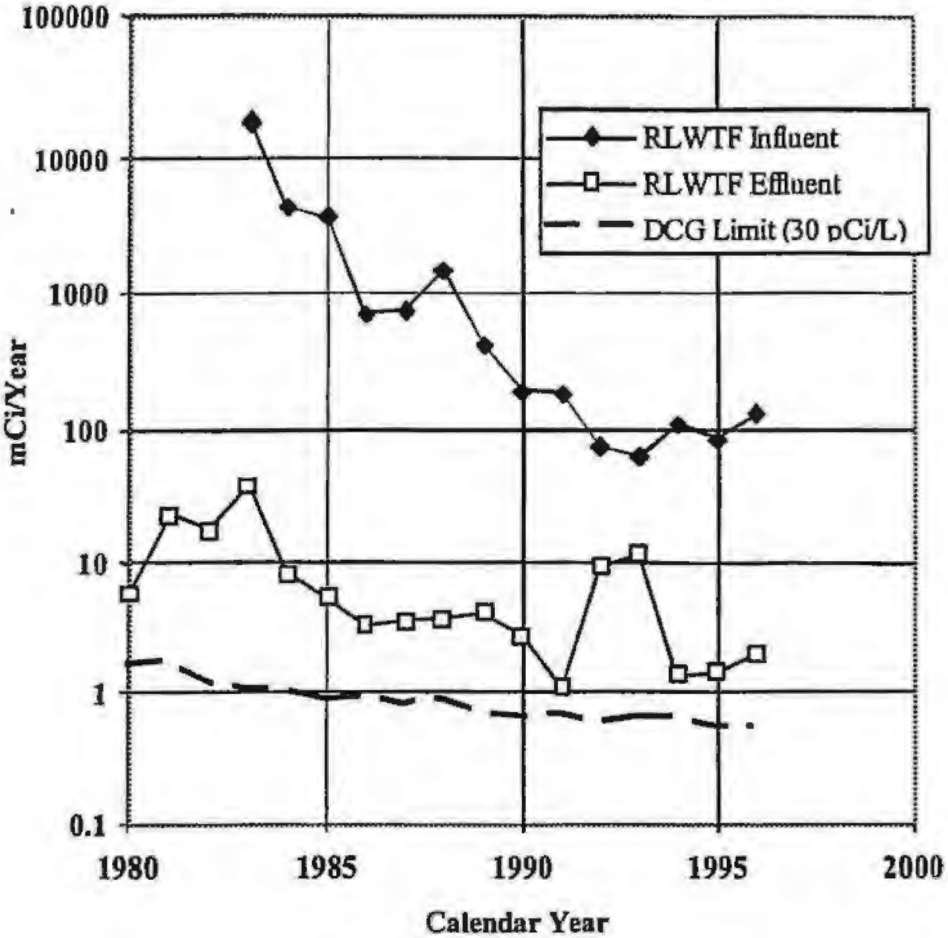

Figure 4. Comparison of ^{241}Am in RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

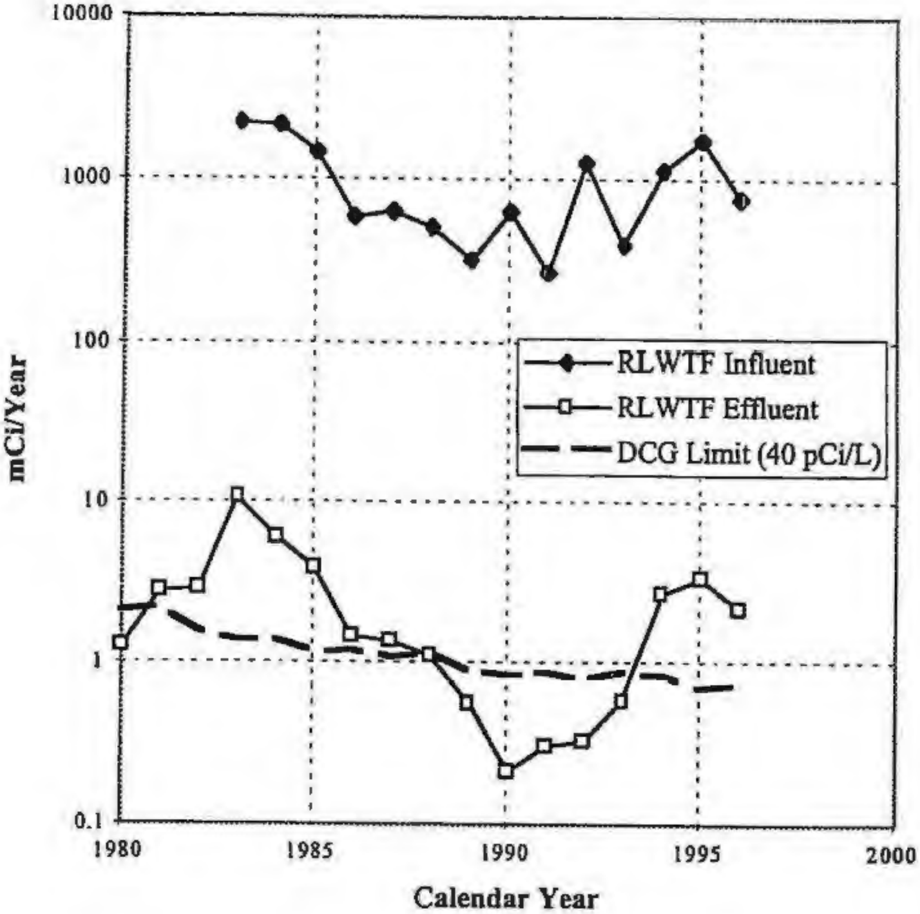

Figure 5. Comparison of ^{238}Pu in RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

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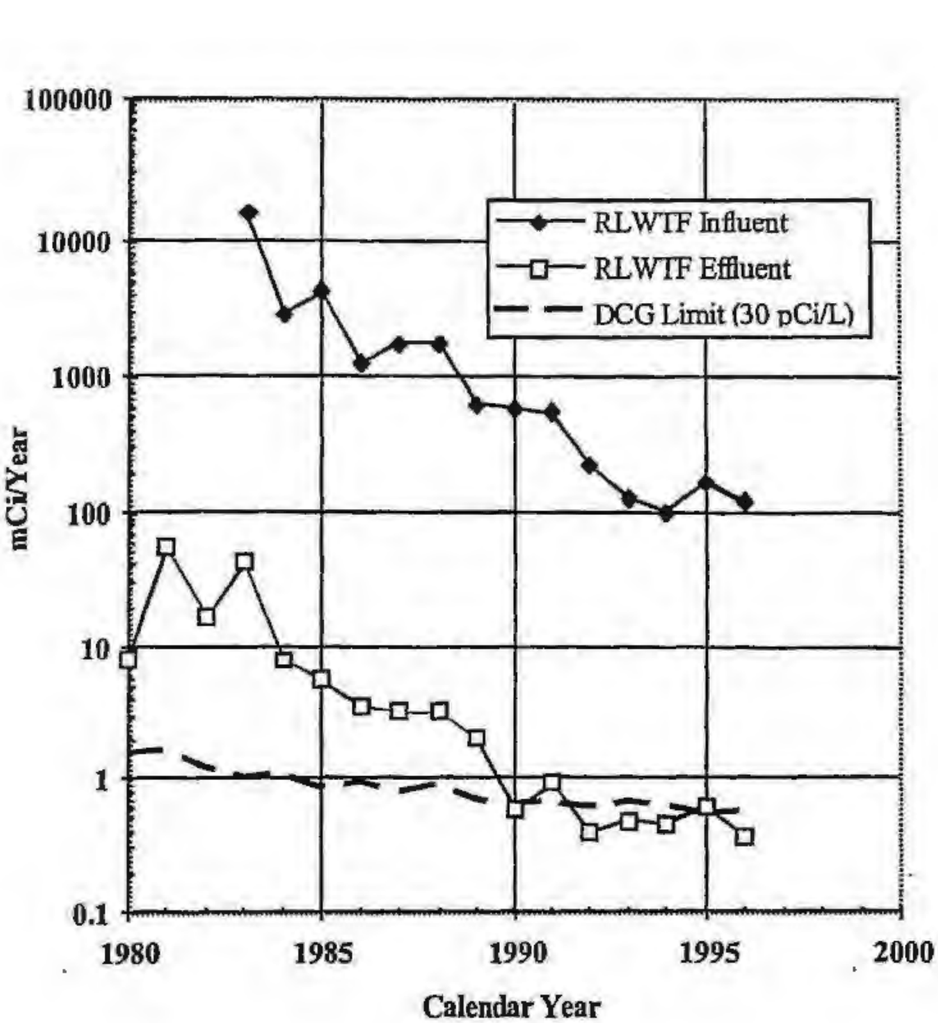

Figure 6. Comparison of $^{239,240}Pu$ in the RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

Treatment and Disposal

The current main plant treatment operation, which has a capacity of 250 gpm, pumps wastewater from the influent storage tanks to a clariflocculator where ferric sulfate and lime are added to form a ferric hydroxide flocculant. Gravity causes floc particles containing radionuclides to settle at the bottom of the clarifier and form a sludge layer. The supernatant flows over the weir at the top of the clariflocculator. The sludge is transferred to a sludge holding tank in preparation for filtration, which is accomplished by a rotary vacuum filter. The filter cake resulting from this operation is low-level waste (LLW) that is drummed for disposal at TA-54, Area G. Supernatant decanted from the top of the sludge holding tanks and filtrate, and from the rotary vacuum filter are recycled to the influent holding tanks.

The clarifier supernatant is passed through an anthracite gravity filter to remove any unsettled floc. Carbon dioxide is bubbled through the gravity filter plenum to lower the pH below 9 and to reduce scale formation resulting from clarifier operations. The filtered effluent is then collected in effluent holding tanks where pH and gross radioactivity measurements are performed. The contents of the tank are then discharged through NPDES outfall 051 to Mortandad Canyon.

The highly radioactive waste process liquids originating at the Plutonium Facility, TA-55, are transported to the RLWTP in separate double-contained pipelines for monitoring and storage. To concentrate the radionuclides, these wastes are treated in a small, 25 gpm ferric hydroxide precipitation facility at the RLWTP. The concentrated solids are mixed with cement in a double drum–tumbler operation. About thirty 55-gal. drums of the cement paste are produced per year. These drums are TRU waste and are stored at TA-54 for future shipment to the Waste Isolation Pilot Plant (WIPP). Treated liquid from this operation is drained to the influent storage tanks for further treatment in the main plant at the RLWTF.

Phase I and II Upgrades

During the Phase I upgrade, additional treatment process equipment will be installed at the RLWTF. It will include equipment for tubular ultrafiltration (TUF) followed by reverse osmosis (RO). Phase I addresses the concentration levels of radionuclides discharged in waters regulated by DOE Order 5400.5. Because effluent from the current RLWTF treatment processes does not meet these limits, the TUF and RO process equipment is being installed to provide treatment that will meet DOE requirements. A permeate stream (product water with low concentrations of contaminants) and a reject stream (concentrate water with a high concentration of contaminants) are produced by both the TUF and the RO. Nitrates are concentrated in the RO reject stream. A rotary centrifugal ultrafilter is used to further dewater the concentrate that comes from the TUF equipment.

This additional process equipment will enable the RLWTF to:

1. ensure that treated effluent is discharged below the DCGs for radionuclides set forth in DOE Order 5400.5,
2. reduce fluoride concentrations in the treated effluent by reducing its source, the food-grade lime used during flocculation, and
3. concentrate nitrates in the waste stream for removal under Phase II.

The TUF equipment provides enhanced effluent quality by removing suspended solids and most of the radioactive constituents from the waste stream. It provides an effluent free of suspended solids and allows efficient additional treatment through the RO. Filtration capabilities of the RO equipment operate at the molecular level, rejecting dissolved solids from the waste stream at rates greater than 96%. The use of RO has been widely demonstrated in industry and municipalities when high purity product water is required.

The RO equipment is the final treatment process prior to discharge. Permeate from the RO equipment is expected to contain contaminant concentrations below those defined in the NMWQCC ground water standards and DOE Order 5400.5. The reject, or concentrate stream, from the RO equipment will be pumped to the clarifier for further removal of radionuclides and other contaminants. After this treatment step, it will be blended into the RLWTF effluent stream. The significant reduction in the amount of ferric sulfate and lime with the Phase I equipment is expected to reduce fluoride effluent concentration to values below regulated levels.

The objective of the Phase II equipment at the RLWTF is to remove nitrates in the RO concentrate stream to below NMWQCC ground water standards. Biological denitrification, which converts the nitrate ion to nitrogen gas, is the process selected for Phase II equipment. Evaporation and ion exchange resins were also investigated for removal of nitrates from the RO concentrate stream. Evaporation of the high-nitrate RO concentrate stream was ruled out because of safety considerations involving nitrates and unknown concentrations of organic constituents. The ion exchange process for nitrate removal would result in a secondary regenerant waste stream of smaller volume, but of very high nitrate concentration, therefore making the process unacceptable. The biodenitrification process was chosen because it safely destroys the nitrate ion with minimum radiation concerns (at as low as reasonably achievable [ALARA] levels), while producing an effluent that meets the minimum regulatory requirements. Figure 7 is a schematic of the RLWTF treatment process after implementation of the Phase I and Phase II process equipment.

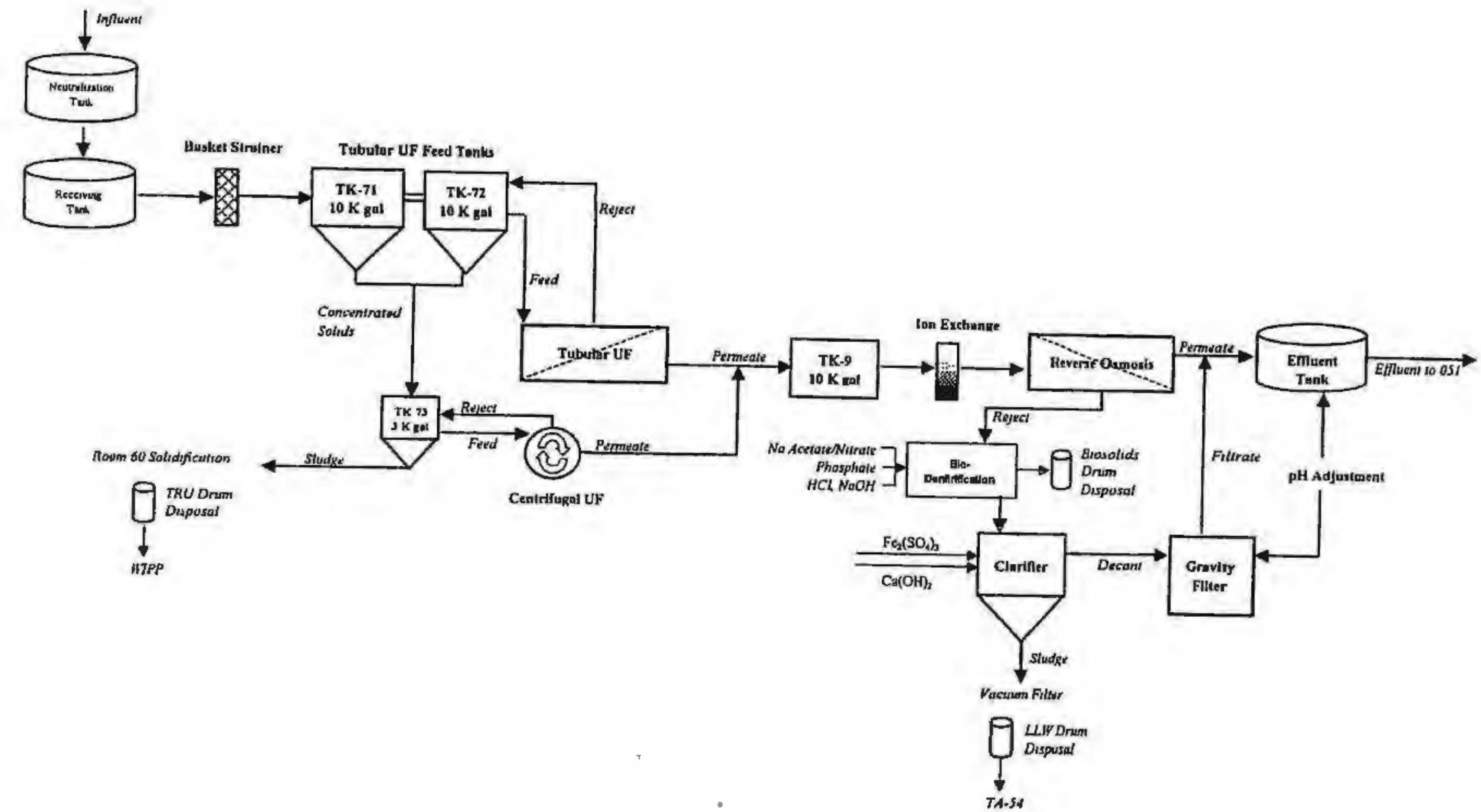

Figure 7. Schematic of the RLWTF treatment process after implementation of the Phase I and II upgrades.

DISCHARGE ALTERNATIVES

The working group has identified three alternatives for the discharge of the treated radioactive liquid waste from the RLWTF:

1. continued discharge to Mortandad Canyon via outfall 051,
2. discharge RO permeate and/or concentrate to SWSC, and
3. zero liquid discharge.

Continued Discharge to Mortandad Canyon via Outfall 051 (Alternative #1)

In this configuration, treated effluent from the RLWTF would continue to be discharged to Mortandad Canyon. Current upgrades, Phases I and II, to the RLWTF treatment process are designed to bring treated effluent into compliance with the DCGs in DOE Order 5400.5 and NMED ground water requirements for all currently monitored constituents. These upgrades, along with the planned construction of a new operations facility are the minimum efforts that must be made toward improvement of the outfall 051 conditions. Further treatment of the RO concentrate stream has the potential for improving the quality of water discharged to outfall 051. Generators improving characterization of waste and reducing some wastes at the source (i.e., tritium, actinides, nitrates, and organics) would also improve the quality of the effluent stream.

Concerns exist regarding the continued use of Mortandad Canyon for RLWTF treated effluent. Contaminants in Mortandad Canyon soils from the RLWTF outfall have been identified. There is concern that contaminants, particularly those in colloidal forms, may be transported farther down the canyon over time. Studies are under way to determine if there is a connection between the shallow perched ground water bodies and the deep regional aquifer that supplies drinking water to Los Alamos County. If such a hydrologic connection exists, there is a possibility that discharges from the RLWTF to Mortandad Canyon may be adding to the movement of contaminants toward the deep aquifer. If this is shown to be true, discharge to outfall 051 would likely be stopped.

Continued discharge of treated effluent to Mortandad Canyon, even with greatly improved water quality, will always retain characteristic "signature" constituents (e.g., plutonium and americium) traceable to the RLWTF. Some stakeholders protest the discharge of any such waste stream to the environment. Additionally, if the effluent cannot meet future regulatory requirements or contaminants are found to be moving off DOE-controlled land, an alternative to discharging to outfall 051 would have to be found.

Table 4 is a summarized compilation of the evaluation criteria that were considered by the working group in evaluating alternative #1, continued discharge to Mortandad Canyon. Both a summary of issues and a qualitative evaluation of each evaluation basis are given. The continued discharge to Mortandad Canyon alternative is based on the assumption that the Phase I and II upgrades at the RLWTF are installed and operating and the RLWTF effluent is in compliance with DOE Order 5400.5 and the NMWQCC ground water standards.

The working group concurs that the potential contaminant transport to the deep aquifer in Mortandad Canyon is a significant concern. Other alternatives for the discharge of the RLWTF effluent should be considered. Also, there is notable public concern regarding this outfall and the discharge of RLWTF effluent to the environment. While it is unquestionably in the best interests of LANL to improve the quality of this effluent to the highest possible level, it appears to be equally important to consider how the discharge of this liquid stream to the environment can be eliminated entirely.

Discharge RO Permeate and/or Concentrate to SWSC (Alternative #2)

In this alternative, RLWTF effluent would be sent to the SWSC Facility at TA-46. The SWSC Facility operates an activated sludge, biological treatment system to remove pollutants from the Laboratory's sanitary liquid waste stream (Royal Crest Trailer Park is also connected to SWSC). The SWSC Facility also performs biodenitrification of the sanitary wastewater.

Section II 3. d of DOE Order 5400.5 permits the discharge of liquid wastes containing radionuclides from DOE activities into publicly owned sanitary sewerage systems as long as the total fractions of the average concentrations for each radionuclide to its respective DCG value is less than five. Liquid wastes with fractions of the average concentrations for each radionuclide to its respective DCG value greater than five may be discharged into a sanitary sewerage system owned by the federal government (Section II 3. d. (3) of DOE Order 5400.5).

Such a federally owned sanitary sewerage system, having effluent concentrations in excess of the DCG levels, must prescribe the best available technology (BAT) level of treatment if the receiving surface waters contain radioactive material at concentrations greater than the DCG values (Section II 3. a. (1) of DOE Order 5400.5). Implementation of the BAT process for liquid radioactive wastes is not required when radionuclides are already at a low level, i.e., the annual average concentration is less than DCG level. In that case the cost consideration component of BAT analysis precludes the need for additional treatment because any additional treatment would be unjustifiable on a cost-benefit basis. Therefore, additional treatment will not be required for waste streams that contain radionuclide concentrations of not more than the DCG values (Section II 3. a. (2) of DOE Order 5400.5).

DOE Order 5400.5 clearly states that radioactive waste streams containing radionuclide concentrations of not more than the DCG reference values at the point of discharge to a surface waterway normally will not require treatment to further reduce the concentration (Section I 5. b. of DOE Order 5400.5). The working group's interpretation of DOE Order 5400.5 is that it is allowable to send radioactive liquid waste from the RLWTF to SWSC at concentrations greater than 5 times the DCG level because SWSC is owned by the federal government. Also, it would be allowable to continue discharging SWSC effluent into Sandia Canyon as long as the effluent is below the DCG level.

There are three configurations of this alternative for the RLWTF effluent:

1. RO concentrate stream sent to SWSC,
2. RO permeate and concentrate streams sent to SWSC, and
3. RO permeate stream sent to SWSC.

Configuration #1 RO Concentrate Stream Sent to SWSC

The SWSC plant has the ability to treat the RO concentrate stream for nitrates. This configuration would eliminate the need for biodenitrification at the RLWTF and would increase the average daily influent volume to SWSC by 1%. The RO concentrate stream (≈2 000 gpd) would combine with the much larger SWSC influent stream (≈200 000 gpd). This dilution ratio would reduce the 150 pCi/L of alpha activity in the RO concentrate stream to 1.5 pCi/L in the SWSC plant influent. Additional removal of some radionuclides would likely occur by interaction with biosolids at SWSC.

Tritium could be reduced at its sources if generators improved their characterization of wastes sent to the RLWTF. This alternative would allow the RLWTF to discharge only the very clean RO permeate stream (≈18 000 gpd) to the environment through outfall 051.

Configuration #2 RO Permeate and Concentrate Streams Sent to SWSC

In this configuration both the RO permeate (≈18 000 gpd) and RO concentrate (≈2 000 gpd) streams would be sent to SWSC. Biodenitrification at the RLWTF would not be needed. This configuration would increase the average daily influent to SWSC by 10%. The RLWTF could then discontinue the use of outfall 051.

Table 4. Evaluation Matrix of Continued Discharge to Mortandad Canyon Alternative

Evaluation Basis	**Summary of Issues**	**Qualitative Evaluation**
Long-term protection of the environment	It is suspected that a hydrologic connection exists between the surficial alluvial ground water in Mortandad Canyon and the deep regional aquifer hundreds of feet below ground surface. Continuing to release the RLWTF effluent to this canyon contributes to the migration of colloidal and dissolved contaminants through the alluvial ground water and also deeper into the tuff.	Radionuclides remaining in the treated effluent will not be disposed of as solids, their most environmentally stable form.
Present regulatory compliance and future legal liability	The implementation of Phase I and II upgrades at the RLWTF will bring the effluent into compliance with present DOE and NMWQCC regulations. More stringent future regulations would require further water treatment. The potential exists that the perched underground waters in Mortandad Canyon may require abatement and the soil may need remediation. The treated liquid waste is regulated by a NPDES permit that allows the RLWTF to operate with a RCRA exemption.	The implementation of Phase I and II upgrades will bring the RLWTF into minimal compliance with the DCGs and NM ground water standards. LANL has a unique geographic relationship to pueblo lands that may impact regulatory requirements.
Satisfaction of public concerns and perceptions	The State of New Mexico, the Los Alamos community, the DOE, and San Ildefonso Pueblo are very concerned about the environmental impact of discharging the treated radioactive liquid waste into Mortandad Canyon.	Continued discharge to Mortandad Canyon manifests to LANL stakeholders that LANL will only make the minimal effort required to handle radioactive liquid waste.
Minimal impact on LANL institutional requirements	No new impact.	LANL remains vulnerable to regulatory challenges.
Supportive of corporate excellence and sustainability goals	The Phase I and II upgrades at the RLWTF will enable LANL to continue to carry out its current mission capability with minimal environmental compliance. The Phase I and II upgrades are a "band-aid" fix until a new facility and treatment equipment are provided. Sustainability goals may be compromised by continued discharges from the RLWTF to the environment.	LANL's concern for present neighbors and future generations is called into question by continuing discharge to Mortandad Canyon.
Technical feasibility	Phase I and Phase II processes are included in the CDR which will provide treatment capability and redundancy for this standard of operation.	Pilot plant tests suggest the full-scale implementation of Phase I and II upgrades are likely to be successful.
Economic feasibility	Requires DOE and congressional funding of a new process building and equipment.	The Phase I and II upgrades are a temporary fix for RLWTF compliance requirements. A long-term, funding commitment is required to procure a new radioactive liquid waste process facility and process equipment.

Configuration #3 RO Permeate Stream Sent to SWSC

Only the RO permeate stream (≈18 000 gpd) would be sent to SWSC. Daily flows to SWSC would increase by 9%. The RO concentrate stream at the RLWTF would be treated with additional technology to an endpoint where the contaminants in that stream would be solidified, requiring additional treatment beyond the scopes of Phase I, Phase II, and the conceptual design report (CDR). The RLWTF could discontinue the use of outfall 051.

The discharge of RLWTF effluents to SWSC raises five major concerns.

Concern #1 Fate of constituents with RLWTF "signature"

Presently, SWSC effluent is pumped to TA-3 where a small portion is used for industrial cooling operations at the Power Plant and the remainder is discharged to Sandia Canyon. A plan currently exists, the Ground Water Discharge Plan DP-857, for the SWSC effluent to also be discharged to Cañada del Buey (1992). If this plan is implemented, SWSC effluent would cross San Ildefonso Pueblo land. During storm events, there is a possibility of surface flow in this arroyo through White Rock to the Rio Grande.

The impact of the RLWTF contributing water to these areas must be considered. Contaminants with the RLWTF "signature" would be discharged to either Sandia Canyon or Cañada del Buey, or to both canyons. The working group felt that significant public concern about this practice would persist even if radionuclides, such as tritium and the actinides, were discharged at concentrations well below their DCG values. Sandia Canyon already has detectable PCB contamination and the alluvium is difficult to monitor due primarily to the location of the Los Alamos County landfill. Flows beyond LANL boundaries and onto San Ildefonso land occur during wet weather in Sandia Canyon due to its large watershed, high volumes of effluent flows, and high percentage of impervious area. Transport of contaminated water and sediments is a significant issue for Sandia Canyon. Neither Cañada del Buey nor Sandia Canyon is, therefore, not a desirable choice for discharge of liquids containing detectable quantities of LANL "signature" constituents. On the other hand, Mortandad Canyon, due to its small watershed area and smaller effluent discharge, has essentially no off-site surface or subsurface flow.

The discharge of treated RLWTF effluent to SWSC would eliminate input of pollutants to Mortandad Canyon. A subsequent improvement in alluvial ground water quality would be expected. Reduced input of water to the contaminated Mortandad Canyon alluvial ground water would reduce the hydraulic head that drives contaminants deeper into the tuff. Also, any downstream transport of contaminated colloids and sediments in Mortandad Canyon would be reduced.

Concern #2 Additional monitoring for radiological parameters

NMED has indicated they would incorporate internal outfall requirements on the RLWTF if the Laboratory connected the discharge to any other NPDES treatment facility. Additionally, NMED would require a permit modification for the disposal of sludge. EPA may also require the Laboratory to develop and implement pretreatment programs as special conditions of the NPDES permit. Pretreatment programs are developed to control significant industrial discharges for the following reasons: ensure the permittee meets effluent standards, prevent pass-through of contaminants, prevent interference, including interferences with its use or disposal of sludge, and improve opportunities to recycle and reclaim sanitary and industrial wastewater and sludge. Pretreatment requirements may require additional treatment and sampling at the sources of discharge for facilities connected to the RLWTF (i.e., TA-55, CMR Building, Sigma Building, etc.).

Additional regulatory compliance monitoring for radiological parameters would also likely be required at all potential sanitary effluent discharge locations. These locations include the SWSC Plant (outfall 13S), the Central Computing Facility (CCF) cooling tower (outfall 03A-027), the Power Plant (outfall 01A-001), and any future reclaimed water reuse sites. Additionally, administrative requirement (AR) AR 9-6 and the SWSC waste acceptance criteria, which state that no radiological waste may be sent to SWSC, would be violated. The potential contamination of the SWSC plant and all reuse facilities (i.e., tanks, cooling loops, and cooling towers) would have to be taken into consideration.

Concern #3 Modifications to SWSC Regulatory Requirements

Sanitary spills from the SWSC collection system downstream from the RLWTF could be considered reportable radioactive waste releases. SWSC sludge is presently managed as Toxic Substances Control Act (TSCA) waste due to the presence of detectable PCB concentrations. The introduction of RLWTF waters to SWSC may require the sludge be handled as a mixed low-level radioactive waste (MLLW). Because the RLWTF is a RCRA treatment, storage, and disposal facility subject to RCRA hazardous waste material regulations, regulatory permits required at SWSC could be affected. NPDES permits would have to be modified to allow SWSC to accept an industrial waste stream. Industrial waste stream acceptance at SWSC would likely mandate start-up of an industrial pretreatment program or monitoring program for the RLWTF. Thus, discharge of effluent from the RLWTF to the SWSC plant would probably not decrease the required monitoring at the TA-50 RLWTF, but simply move the monitoring location. The NMED would also likely require the preparation of a ground water discharge plan for Sandia Canyon, modification of the current Ground Water Discharge Plan (LANL, 1992), and modification of Ground Water Discharge Plan Application for Sanitary Sewage Sludge Land Application Sites (LANL, 1995). Modification of these regulatory documents is usually a very time-consuming process.

Concern #4 Increased cost of doing business for LANL

A major increase in capital and operations and maintenance (O&M) costs at SWSC would be expected for influent radiological monitoring equipment, new procedures, additional analyses, and extra reporting for waters and for sanitary sludge, grit, and screenings. Additional radiological training, equipment, and hazard analyses for SWSC operators would be required. The SWSC plant and reuse system administration might need to be moved from Facilities Engineering (FE) Division to Environmental (EM) Division to properly manage a radioactive waste.

Costs at the RLWTF would be reduced by sending the RO concentrate stream to SWSC. The need for biodenitrification and salt removal from the RO concentrate stream at the RLWTF would be eliminated.

Concern #5 Operational considerations at SWSC

Addition of RLWTF waters, particularly the configurations that include the RO permeate stream, would add to the hydraulic loading of the SWSC plant. The SWSC plant nitrification and denitrification treatment process is vulnerable to hydraulic overloading of the reaction basins. RLWTF effluents to SWSC may need to have nutrients added to maintain a particular food to microorganism ratio in order to achieve the desired denitrification. Addition of excess amounts of water without appreciable biodegradable material adversely affects the process.

The working group recognizes there would be immediate benefits to the RLWTF should alternative #2 (discharge of RO permeate and/or concentrate to SWSC) be adopted. These benefits are: denitrification of the RO concentrate stream could be performed at SWSC, there would be no need to mix the high TDS RO concentrate stream with the RO permeate stream, and no treated radioactive liquid waste would be discharged from outfall 051. However, the costs (economic, regulatory, legal, public perception) far outweigh the immediate benefits. Changes in future regulatory and environmental policy could render this alternative unfeasible, making it at best a temporary solution.

Table 5 is a summary of the factors that were considered by the working group in evaluating alternative #2. This alternative may be shown to be within the limits set by DOE Order 5400.5, but long-term relations with stakeholders and any environmental impact preclude its implementation.

Zero liquid discharge (Alternative #3)

Zero liquid discharge from the RLWTF means that no treated liquid radioactive waste will be discharged to the environment. The working group considered the following three methods to eliminate the RLWTF liquid discharge to outfall 051.

1. Redirect the treated liquid flow to another discharge point. This option merely exports the environmental problem to another location.
2. Totally recycle the RLWTF effluent. This is the ideal option. Contaminants and salts would be removed and solidified and the water would be reused in Laboratory facilities.
3. Totally evaporate the treated liquid waste stream following the removal of contaminants and salts.

Options two and three are zero liquid discharge options. In these options the RLWTF influent would be treated as currently planned in the Phase I and Phase II upgrades. In addition, the biodenitrified RO concentrate stream would be evaporated to a highly concentrated salt solution that can be solidified. RO permeate water would be reused or recycled in LANL facilities or evaporated. Various methods to evaporate the treated RLWTF effluent are being considered: cooling towers, mechanical evaporators, land application, evaporation ponds, and constructed wetlands. There would be no liquid discharges to the environment from the RLWTF.

An important consideration in this alternative would be loss of the RCRA exemption currently provided to the RLWTF due to its oversight by the EPA through the NPDES permitting process. Loss of this exemption would mean that the RLWTF would be required to meet additional RCRA regulatory guidelines regarding waste treatment practices. RCRA guidelines regarding waste treatment at the RLWTF would focus on concentrations of metals and organics in the RO concentrate stream and sludges produced at the RLWTF. Additional sampling procedures would likely be needed at the RLWTF. The RLWTF would need to manage the constituents in the waste stream and so have much better knowledge of, and control over, wastes discharged to it for treatment.

Table 5. Evaluation Matrix of Discharge RO Permeate and/or Concentrate to SWSC Alternative

Evaluation Basis	Summary of Issues	Qualitative Evaluation
Long-term protection of the environment	Discharge of treated radioactive liquid waste to SWSC increases the possibility of contamination at the SWSC Facility, Sandia Canyon, and TA-3 facilities with the following radionuclides: $^{238,239,240}Pu$, ^{241}Am, ^{3}H, ^{137}Cs, and ^{90}Sr. Issues regarding approval of SWSC effluent discharges to Cañada del Buey will be complicated.	The area contaminated by LANL signature constituents will be increased. The present and future exposure of humans to radionuclides is increased.
Present regulatory compliance and future legal liability	The SWSC WAC would need to be changed to accept radionuclides. Monitoring of constituents and regulatory oversight would increase.	The potential exists for legal, technical, environmental, and economic liabilities.
Satisfaction of public concerns and perceptions	The area of radioactive contamination will be enlarged and the potential exposure of humans to radioactivity will increase.	LANL will be perceived as not caring if it contaminates additional facilities, canyons, and noncontaminated environments.
Minimal impact on LANL institutional requirements	This alternative would reverse the current policy to separate the radioactive and nonradioactive liquid waste streams at LANL. There would be major impacts on monitoring and operations at SWSC. The SWSC NPDES permit would need to be modified to allow industrial inputs to the facility. Also, permitting and disposal of solids may be impacted.	This alternative would eliminate the biodenitrification process at the RLWTF. Increased hydraulic loading at SWSC and demand on the SWSC biodenitrification process will result.
Supportive of corporate excellence and sustainability goals	This alternative may produce a new environmental legacy problem. Because of changing environmental regulations and concerns, this may not be a long-term solution.	This alternative may be shown to be within the limits set by DOE Order 5400.5. Long-term relations with stakeholders and environmental impact preclude its implementation.
Technical feasibility	Mixing a small volume of contaminated water (treated RO concentrate) into a much larger waste stream (SWSC influent) is not considered technically sound. Additional water from the RLWTF could adversely affect denitrification at SWSC.	Significant alterations of the SWSC plant operation would be required.
Economic feasibility	Requires DOE and congressional funding of new process building and equipment. Operational costs would decrease for the RLWTP, but would increase at the SWSC. Monitoring costs at SWSC would greatly increase. This alternative would eliminate the 051 outfall with minimal capital cost.	Decreased costs at the RLWTF would likely be counterbalanced by increased costs at SWSC.

Table 6 is a summarized compilation of the factors that were considered by the working group in evaluating alternative # 3, zero liquid discharge. The working group recommends implementation of this alternative at LANL because it would: protect the environment long-term, meet future regulatory standards, satisfy stakeholder concerns, support corporate excellence and sustainability goals, and have minimal impact on LANL institutional requirements.

Table 6. Evaluation Matrix of Zero Liquid Discharge Alternative

Evaluation Basis	Summary of Issues	Qualitative Evaluation
Long-term protection of the environment	Offers the best long-term environmental protection solution. The maximum amount of radionuclides will be solidified for long-term disposal. The majority of tritium will be isolated from the RLWTF. Tritium that does reach the RLWTF will be released to the atmosphere, its most environmentally benign state.	This alternative will dispose of the radioactivity in its most environmentally stable form, decrease the area contaminated, and reduce present and future exposure of humans to radionuclides.
Present regulatory compliance and future legal liability	This alternative would comply with all current regulatory standards and is expected to comply with future regulations governing radioactive liquid waste management.	The minimal amount of radionuclides will be discharged to the environment.
Satisfaction of public concerns and perceptions	San Ildefonso Pueblo and other stakeholders would likely favor the implementation of zero liquid discharge of treated radioactive liquid waste. Concern regarding air emissions could increase.	This alternative will show the RLWTF as being the best steward possible of its solid, liquid, and atmospheric emissions.
Minimal impact on LANL institutional requirements	The loss of the NPDES permit at the RLWTF will cause the loss of the RCRA exemption for the RLWTF. RCRA regulatory oversight will increase at the RLWTF. NPDES regulatory oversight will decrease.	Increased identification and quantification of the RLWTF influent stream will be required.
Supportive of corporate excellence and sustainability goals	This alternative is certainly in line with corporate excellence standard. Zero liquid discharge puts contaminants in their most environmentally benign state.	This alternative best exhibits the goals of corporate excellence and environmental sustainability.
Technical feasibility	This alternative would be the most technically challenging. Additional research and testing of possible treatment equipment will be required. These efforts would place the contaminants in their most benign environmental states.	Major technical efforts in data collection and process testing would be required to implement Phases III, IV, and V.
Economic feasibility	Requires DOE and congressional funding of new process building and equipment. Additional funding required for Phases III, IV, and V.	Substantial funding of design efforts would be required to implement Phases III, IV, and V.

ZERO LIQUID DISCHARGE IMPLEMENTATION

Setting a course toward zero liquid discharge of treated radioactive liquid waste is the recommendation of this working group. Attaining zero liquid discharge of radioactive wastewater will require a stable funding source, competent engineering, concern for the environment, and perseverance over a 5–10-year period. Three additional phases are proposed to take LANL from the Phase I and II RLWTF upgrades to zero liquid discharge of treated radioactive wastewater.

Phase III Upgrade: Minimization and Source Identification of Radioactive Liquid Waste

Phase III involves the identification and minimization of wastes at their sources. This includes an aggressive program of metering, controlling the volume of flow to the RLWTF, and characterization and minimization of actinides, organics, and nitrates when feasible. Phase III also involves the isolation and evaporation of tritiated wastewaters at the several facilities discharging tritium in their radioactive liquid waste.

Flow Metering and Identification

The RLWTF currently monitors and maintains the collection system for radioactive liquid waste. This includes the main underground collection system, as well as waste holding tanks and telemetry units (primarily level gauges and flow meters) within several buildings feeding into the collection system. Aside from the data collected by the flow meters in the field, the earliest data collection point for RLWTF raw influent is the headworks of the plant. At this location flow and pH are measured. Also, a 24-hour composite sample is collected continuously. Analytical information derived from these composite samples reflects the blended waste received from all generator sources that feed into the collection system.

The RLWTF relies on the generators to supply information regarding waste constituents. The RLWTF WAC require a waste profile be completed and approved prior to any discharges. It has been difficult to monitor and enforce compliance with this method of waste identification, and only a small percentage of the flow received at the RLWTF can be accounted for by waste profiles. Many generators do not file the required waste profiles. Some flows are not considered RLWTF influent and therefore not profiled, such as duct wash water or mop water. The waste profile management system is housed at TA-54 and was primarily designed for solid waste tracking and handling.

As regulatory requirements become more stringent and as the possibility of eliminating outfall 051 progresses, it will be important to have complete characterization of wastes discharged to the RLWTF. This is particularly true regarding RCRA-regulated constituents. If the outfall 051 NPDES permit is allowed to be deleted, operation of the RLWTF will fall under RCRA guidelines. Management of waste at the source, including management of the waste generators' WAC and management of facility connections to the collection system, is a necessary part of this process. Specific monitoring regimes will be required by the RLWTF.

The following recommendations should be considered.

1. Begin a deliberate, coordinated effort to bring all LANL RLW generators into compliance with the current RLWTF WAC guidelines and criteria. Establish a method to ensure that complete compliance is maintained. Also, the RLWTF needs direct access to the waste profile management system to procure the required degree and nature of data.
2. Evaluate and designate responsibility for collection system upkeep before connecting to the main RLWTF collection system (at first manhole outside the building, or where the pipe leaves the building).
3. Develop contractual criteria for the condition of connections at facilities connected to the RLWTF collection system. Also, contractual agreements should be formed for any new connections.

Waste Minimization of Actinides and Nitrates

There are several waste minimization and pollution prevention technologies currently under investigation at LANL. The following technologies are being developed and implemented at the Plutonium Facility and in the CMR Building. These are the two major generators of RLW that is treated at the RLWTF.

Historically, aqueous nitrate operations at the Plutonium Facility have processed acid waste streams through a single-stage distillation process in an evaporator. That process concentrated the salts, which were immobilized and disposed at TA-54, and generated an approximately 5 M acid waste stream that was discharged to the RLWTF for treatment. A fractional distillation column has been designed for concentrating the nitric acid to the 12–15 M range. This process recovers 99.99% of the acid, removes most of the radioactivity, and reduces the nitrate concentration to approximately 45 ppm in the liquid waste stream going to the RLWTF. Implementation of this technology at TA-55 and the biodenitrification process at the RLWTF will ensure that nitrate concentrations will not exceed NPDES permitted levels.

The aqueous chloride operation processes material in a series of steps that ends with hydroxide precipitation that produces a TRU solid hydroxide cake and a liquid waste stream discharged to the RLWTF for subsequent treatment. The hydrochloric acid liquid waste stream is a relatively minor waste stream by volume (approximately 10–15% of the volume of the nitric acid waste stream); however it contains approximately 80% of the total inventory of radionuclides discharged to the RLWTF from TA-55. Electrochemical ion exchange is a process that is currently being tested for use in the chloride recovery operations. Preliminary results indicate that this process is expected to eliminate 99% of the plutonium, americium, and dissolved solids from the effluent stream and thus will significantly reduce the radionuclide activity sent to the RLWTF.

In addition to these efforts, better precipitation reagents and improved ion exchange resins that would more completely and more efficiently remove the actinides from the aqueous stream are being investigated to help further reduce the activity burden on the RLWTF.

Volume Reduction in Flow to RLWTF

The CMR Building is the major contributor of radioactive liquid waste volume to the RLWTF. Sources of liquid waste include numerous programmatic activities that generate small volumes of liquid waste, including wash water from custodial activities in radiation control areas (RCAs), duct washdown system water, and effluent from the chilled-water system. Approximately 60% of the liquid waste is from the duct wash-down systems, approximately 30% from the chilled-water system, and the remaining 10% from programmatic and custodial activities. The duct washdown system has not been utilized for months, although it will be reactivated in several wings. It is anticipated that after normal operations are resumed in the CMR Building, the volume of water from duct washdown may increase to historical volumes.

Replacement of the chilled-water system could have a significant impact on the volume of radioactive liquid waste sent to the RLWTF. The chilled-water system was designated for replacement as a part of the CMR upgrades, but replacement has been postponed. The chilled-water system is a series of evaporative-type coolers that provide chilled water to equipment, processes, boilers, and laboratories in the building. The water in the chiller needs to be blown down occasionally and make-up water is added to the system. The blow-down is collected and routed to the RLWTF for treatment. Because the chilled water travels through plumbing in radiologically controlled areas, there is the possibility for contamination and, in the past, low levels of contamination have been found.

The alternative technology to the current chilled-water system is a refrigerated system. A refrigerated system would dramatically reduce the volume of liquid waste generated because compressors and refrigerant would cool the water in contrast to evaporative cooling. Thus, the chilled-water system blow-down would be eliminated.

Satellite treatment of wastes that are presently sent to the RLWTF would also decrease the volume of liquid flow to the facility. Satellite treatment requires a high ratio of effort and expense to volume of waste treated. In some cases, however, satellite treatment of a specific contaminant in a small waste stream can be more cost-effective than treatment of a much larger waste stream with mixed contaminants.

Tritiated Liquid Waste Minimization and Evaporation

Tritium is a naturally occurring isotope of hydrogen produced by the interaction of cosmic rays with the atmosphere. Man-made sources of tritium are produced by nuclear accelerators and nuclear reactors. Natural and man-made tritium are chemically identical. In addition, the chemical properties of tritiated water and regular water are very similar. Thus, to remove tritium from water is very much like trying to remove water from water.

Removal of tritium from aqueous wastewater to near-drinking-water standards (20 000 pCi/L) is currently uneconomical. As a result, tritiated waste streams must be discharged either as a liquid via a permitted outfall or as water vapor to the atmosphere. The tritiated effluent from the RLWTF is currently discharged to Mortandad Canyon outfall 051. From a health physics perspective, the risk associated with discharging tritium to the atmosphere is several orders of magnitude less than the risk associated with discharging tritium in aqueous form. The malfunction at the Three Mile Island nuclear power station in 1979 resulted in a large volume of tritiated water. Rather than dilute the tritiated water by slowly feeding it into the Susquehanna River, evaporation ponds were built to disperse the tritium into the atmosphere. Dispersion of tritium into the atmosphere is environmentally preferable to release of tritium into ground water. As a result, the options listed in this section recommend waste minimization followed by the use of evaporative technologies to discharge the tritium to the atmosphere.

For calendar year 1996, the major generators of tritium in the RLWTF influent are given in Figure 8. In 1996 the RLWTF discharged 1.30 Ci of tritium with 16 537 000 L of effluent. The average tritium concentration in this discharge was 78 612 pCi/L, nearly four times the drinking water standard of 20 000 pCi/L. However, this is far less than the outfall 051 NPDES permit limit of 3 000 000 pCi/L. The working group has recommended that the Laboratory voluntarily adopt the lower drinking water limit. To meet the 20 000 pCi/L drinking water standard, only 0.33 Ci of tritium should have been discharged during that period.

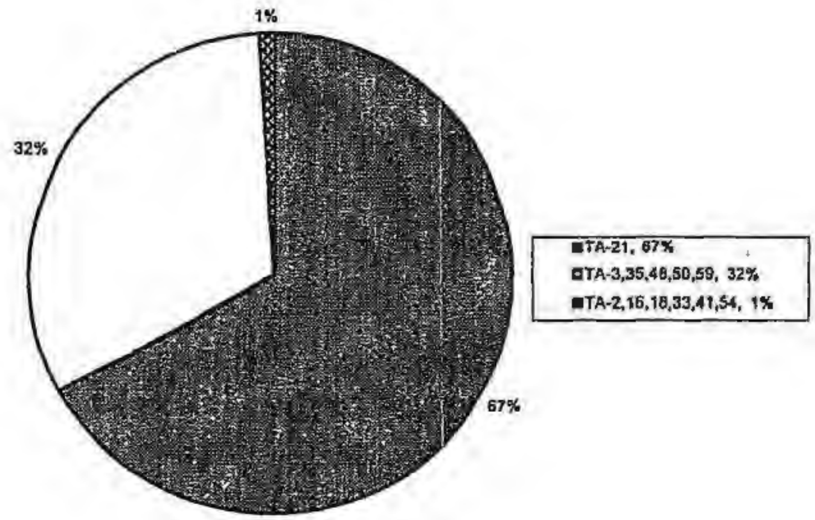

Figure 8. Major generators of tritium to the RLWTF by technical area (calendar year 1996).

As shown in Figure 8, the TSTA Facility and the Tritium Science Fabrication Facility (TSFF) at TA-21 are the largest contributors of tritium activity sent to the RLWTF. The TSTA Facility is dedicated to developing, demonstrating, and integrating technologies related to the deuterium-tritium fuel cycle for large-scale fusion reactor systems. The TSFF Facility provides support for tritium-related experiments. Presently, the TSTA and TSFF Facilities discharge an average of 2500 L/day with an activity of approximately 1.2 µCi/L. The sources include primary coolant loop flushing, component washing, hand washing, cooling tower blow-down, and custodial activities. The fidelity of these numbers is somewhat unclear because a faulty blow-down controller for an aging cooling tower and heat exchanger at the TSTA Facility intermittently sends 20 000 L of tritiated water to the RLWTF. A replacement cooling tower has been purchased and is ready for installation. With the installation of the new cooling tower and heat exchanger, there will be no contamination crossover from the primary to the secondary cooling loop. Therefore the blow-down will no longer be contaminated with tritium. Upon completion of this work the tritium activity discharged by TSTA to the RLWTF will be greatly reduced.

The next largest contributor of tritium to the RLWTF is 0.41 Ci/year from the collection system that includes sources from TA-3, 35, 48, 50, and 59. Waste profiles from the tritium generators at these sites are presently incomplete: therefore, it is not possible to distribute the 0.41 Ci/year among the various sources.

In addition, tritium-contaminated wastewater is trucked to the RLWTF from TA-2, 16, 18, 33, 41, and 54. These sources combined contribute only 1% of the total tritium activity sent to the RLWTF.

Tritium reduction in the RLWTF effluent must be accomplished by eliminating tritium in the RLWTF influent because there is no practical treatment option for tritium. Isolating tritiated wastewater from the RLWCS is essential to the RLWTF discharging an effluent that meets the drinking water standards for tritium. Historically, programmatic activities produced tens to hundreds of Curies of tritium per year that have been released to the environment through outfall 051. Future mission needs at LANL may once again yield highly tritiated waste streams. The collection and handling of these streams apart from the RLWTF is advised.

As stated above, the TSTA and TSFF Facilities are the largest contributors to the tritium activity discharged to the RLWTF. By demonstrating that this waste stream can be eliminated from the RLWTF influent, it is possible to reduce the tritium concentration in the RLWTF liquid effluent to nearly 20 000 pCi/L. The recommendations listed below focus on this waste stream with the intent that a more detailed effort may determine that other generators can benefit from the same disposition. Further reductions can be realized by addressing upstream segregation and minimization at the source generator.

Current Tritiated Wastewater Disposition at TA-21

Tritiated wastewater from the TSTA and TSFF Facilities are currently pumped to a tank at TA-21-257 (the TA-21 Radioactive Liquid Waste Treatment Facility). The waste is transferred to the RLWTF through the cross-country line. This is shown schematically in Figure 9. The cross-country line emanates from TA-21-257 and follows DP Road west toward the Los Alamos townsite. Approximately one-quarter mile west of the TA-21 front gate, the line turns south and crosses Los Alamos, Sandia, and Mortandad Canyons before it terminates at TA-50 (see Map 1). Presently the TSTA and TSFF wastewater are the only influent to the TA-21- 257 treatment facility. If this wastewater source is re-routed, then the cross-country line could be removed. This would enable the DOE to release this land to Los Alamos County.

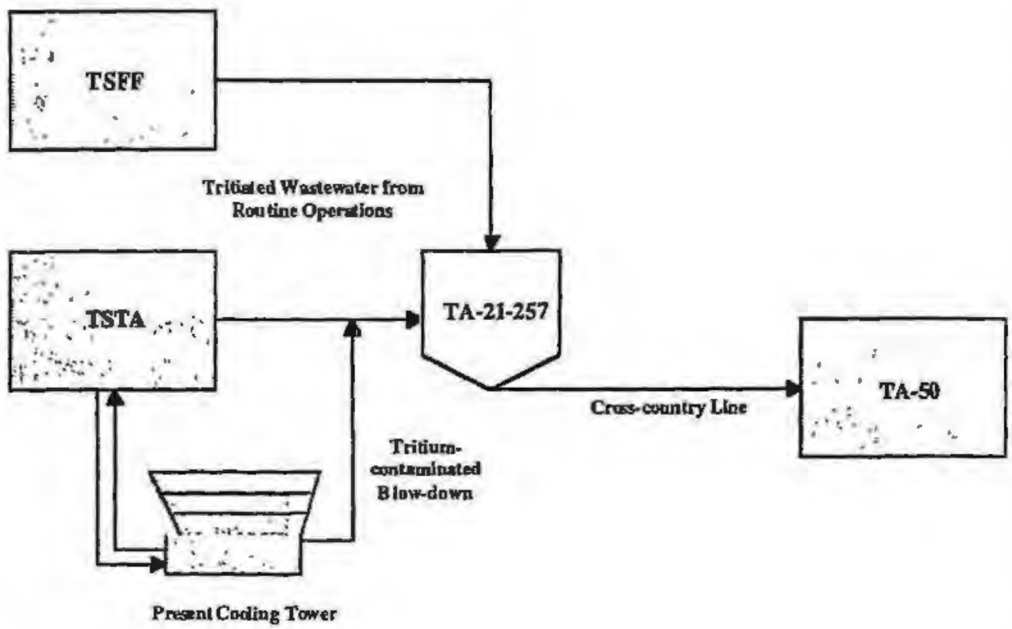

Figure 9. Current TA-21 to TA-50 radioactive wastewater flow sheet.

The two options listed below operate with the underlying assumption that the new cooling tower at the TSTA Facility will be installed, therefore providing a reduction in the volume of tritiated wastewater from approximately 2500 L/day to approximately 275 L/day. With this smaller volume, several options become available for the elimination of this influent stream to TA-50.

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Option 1 Transfer of tritiated wastewater to TA-53

Tritiated wastewater from TSTA and TSFF operations will be collected in a 5000-gal. storage tank. The storage tank will be pumped down once per month and the wastewater will be trucked to the radioactive wastewater lagoon at TA-53 for evaporation. Figure 10 shows the proposed radioactive wastewater flow sheet for this option. The LANSCE Facility at TA-53 routinely produces tritiated water from programmatic activities. Currently this water is sent to a lagoon where the short-lived activation products decay and the tritium evaporates by natural convection to the atmosphere. In 1995 the lagoon at TA-53 released approximately 95 Ci with a total annual dose to the nearest off-site residence of 6.8×10^{-3} mrem. The effluent from TSTA will introduce approximately 0.25 Ci per year. At this level, the radiation dose to the public at the lagoon will still be well below the applicable health physics limits.

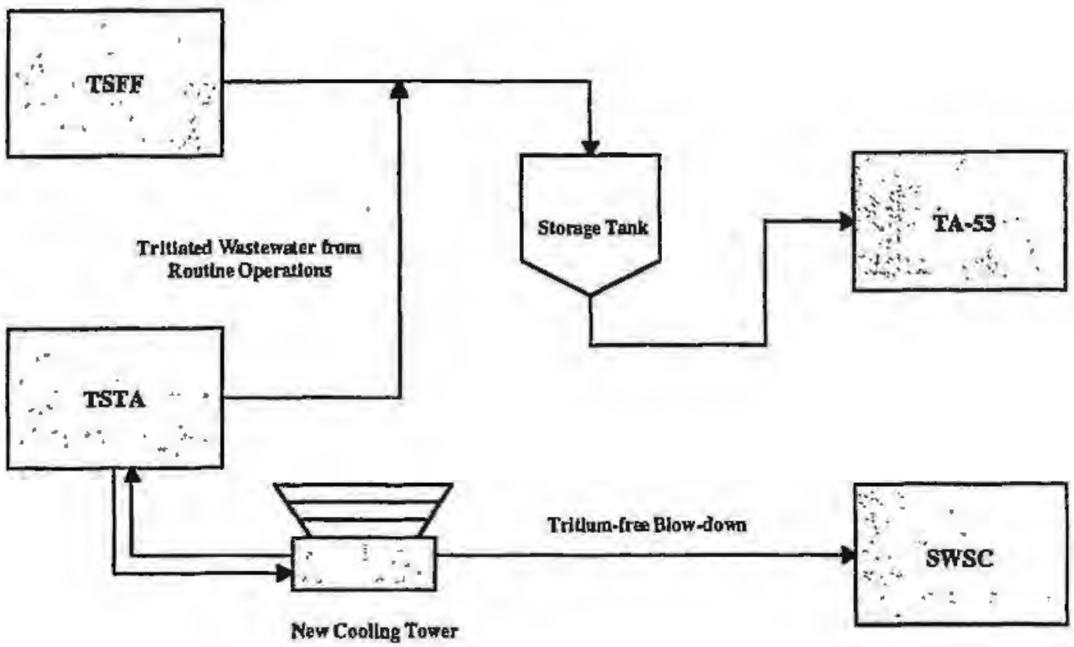

Figure 10. Proposed TA-21 to TA-53 radioactive wastewater flow sheet.

There is presently a project underway to eliminate the radioactive wastewater evaporative lagoons at TA-53. This new RLW treatment system and solar evaporative unit is expected to be operational in 1999. TA-53 is not a source of wastewater influent for the TA-50 RLWTF. However, to reduce the burden on the RLWTF, the TA-53 treatment system may be a sink for the tritiated wastewater generated at TSTA and other facilities.

Once the new wastewater treatment system has been implemented at TA-53, the tritiated wastewater from TSTA can be treated by this system. A preliminary engineering analysis has concluded that this system can accommodate the tritiated wastewater streams from the TSTA Facility and other generators as long as analysis of the influent is sufficient to ensure compatibility of the constituents. Before the implementation of this scenario, a WAC and waste profile must be established for the TA-21 waste stream to provide administrative controls. In addition, to ensure compliance with Clean Air Act (CAA) and RCRA regulations, the waste stream will have to be monitored periodically for any listed or characteristic hazardous constituents. The TA-53 air release permit must also be modified.

Benefits of option 1 include:

1. collection of the wastewater in a temporary storage tank and trucking the waste to TA-53 will allow the elimination of the cross-country line,
2. the major tritium source to the RLWTF will be eliminated,
3. risk associated with the release of tritium into the atmosphere is several orders of magnitude less than for liquid discharge, and
4. the TA-53 radioactive wastewater treatment and evaporation system is already planned for construction and operation by 1999.

<u>Option 2 Install a dedicated evaporator</u>

Under this option, tritiated wastewater from TSTA and TSFF operations would be collected in a 5000 gal. storage tank. As shown in Figure 11, the waste would be fed into a continuously operated open-air evaporator. With an open-air evaporator, the wastewater is boiled off and discharged to the atmosphere as water vapor. There is no secondary distillate stream and only a small amount of residue must be drummed for disposal.

The proposed unit will have the capacity to evaporate 5 times the volume estimated from TSTA and TSFF and therefore has the potential to accommodate other tritiated wastewater sources. For example, radioactive liquid waste that is currently trucked from TA-16 to the RLWTF may instead be transferred to this unit for evaporation. The introduction of a new point source for radionuclide air emissions will require CAA permitting. A WAC and a waste profile must be established for this waste stream to provide administrative controls. In addition, to ensure compliance with the RCRA regulations, the waste stream will have to be monitored periodically for any listed or characteristic hazardous constituents.

An analysis of the radioactive air emission limits has estimated the evaporation of the 0.8 mCi/day estimated for TSTA and TSFF will result in a dose of 1.5×10^{-5} mrem/yr to the nearest off-site residence. This is several orders of magnitude below the specific evaluation limit.

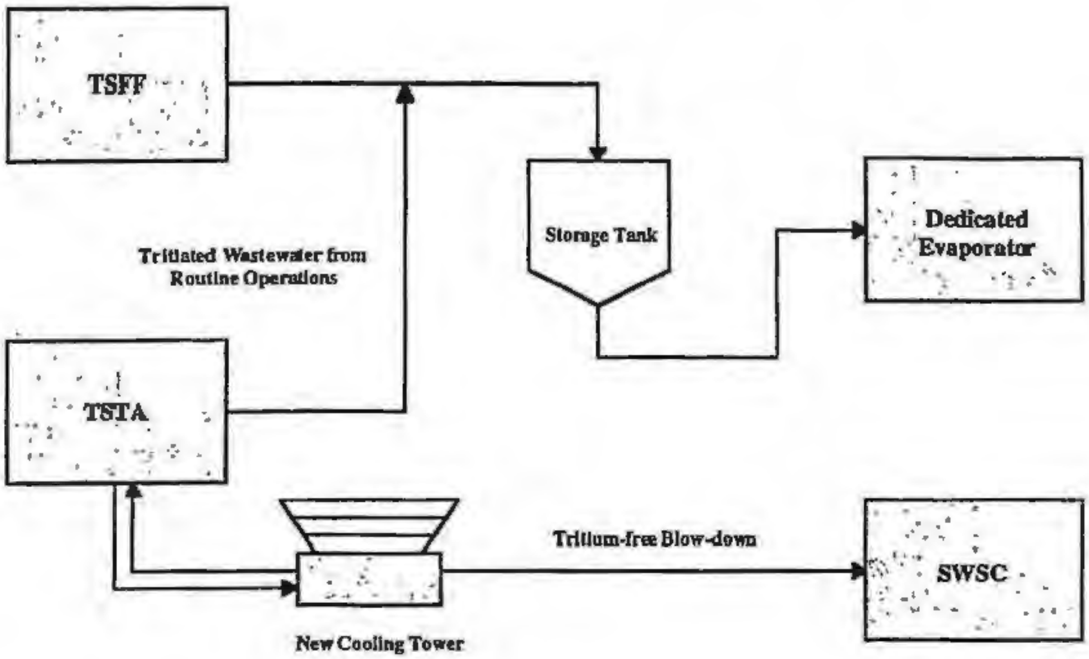

Figure 11. Proposed TA-21 to a dedicated evaporator radioactive wastewater flow sheet.

Benefits of option 2 include:

1. evaporation of the liquid waste stream will allow elimination of the cross-country line,
2. the evaporator can be used to eliminate tritiated wastewater from other generators,
3. there will be no dependence on the TA-53 new treatment and evaporation system,
4. the major tritium source to the RLWTF will be eliminated, and
5. the risk associated with release of tritium into the atmosphere is several orders of magnitude less than for liquid discharge.

In an effort to put these additional releases of tritium to the atmosphere into perspective, the following facts and calculations are presented. During 1996, 680 Ci of tritium were discharged into the atmosphere through monitored stacks at LANL (Environmental Surveillance at Los Alamos, 1996). During calendar year 1996, the RLWTF discharged only 1.3 Ci of tritium to Mortandad Canyon. If all this tritium were

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atomized and discharged to the atmosphere, it would increase the LANL-wide total emission of tritium by less than 0.2% based on 1996 numbers. If released to the atmosphere, the 0.87 Ci of tritium from the TSTA and TSFF Facilities would be an even smaller fraction of the LANL-wide emissions.

Phase IV Upgrade: Treatment of Reverse Osmosis Concentrate to Allow Reuse

Once the Phase III waste minimization and monitoring programs are in place and excess tritium is removed, the next logical step toward zero discharge is to prepare the water for productive reuse as a supply of industrial makeup water. To meet practical requirements for an industrial water supply, the effluent would need further treatment to be near drinking-water quality.

Ideally, industrial reuse would occur near TA-50 to minimize the cost of piping the water. Potentially attractive uses in the vicinity of TA-50 include washing the containment vessels from the DARHT Facility, water for plutonium processing at TA-55, and augmenting potable water makeup in an existing heating, ventilation, and air conditioning (HVAC) cooling tower.

The quality of water required for reuse is determined by the particular use and protection of public health and the environment. Recirculating cooling water systems are subject to problems such as scaling, corrosion, biological growth, fouling, and foaming if makeup water quality is poor. The limits recommended by the EPA for cooling water makeup for conventional (nonradioactive) contaminants are shown in Table 7.

As a matter of policy, the working group feels that industrial reuse water at LANL should also meet DOE's DCGs for drinking water for radioactive constituents (see Table 2). This is prudent to minimize user concerns and to protect the public health in the event of an accidental cross connection between the industrial reuse system and the potable water supply system.

Table 7. Conventional (nonradioactive) Contaminant EPA Limits for Cooling Water Makeup

Parameter	Recommended Limit (ppm)
Chloride	500
TDS	500
Hardness	650
Alkalinity	350
pH	6.9–9.0 units
Chemical oxygen demand	75
Total suspended solids	100
Turbidity	50
Biochemical oxygen demand (BOD)	25
Organics	1.0
NH_4-N	1.0
PO_4	4
SiO_2	50
Al	0.1
Fe	0.5
Mn	0.5
Ca	50
Mg	0.5
HCO_3	24
SO_4	200

In order to meet the proposed industrial water quality limits and implement a closed loop recycle scheme, it is necessary to have some kind of a "sink" to remove dissolved contaminants from the recycle system. Otherwise, dissolved contaminant levels would rise with each reuse of the water, leading to unmanageable concentration increases with scaling, corrosion, and contamination concerns. In the new RLWTF process the RO concentrate stream will contain the majority of the contaminants remaining in the plant effluent at the completion of Phase II. To satisfy industrial water quality requirements with a recycled water supply, it will be necessary to divert the RO concentrate stream from the product water. To do this without discharging liquid waste to the environment, the RO concentrate stream will need further treatment to reduce its volume, allowing disposal of its contaminants as dry solids.

RO Concentrate Disposal Options

Option IV-1

RO concentrate ⇒ solar evaporation

An option considered for removing the salts from the RO concentrate stream is the use of a solar evaporation pond. A double-lined pond with a leak detection system would be required to protect ground water from leakage. Based upon annual rainfall data and evaporation rates in the Los Alamos area, a pond with a surface area of 1 acre should evaporate 2 000 gpd of water. Evaporation ponds at Public Service Company of New Mexico's San Juan Power Generating Facility near Farmington, NM, were designed for 1.25 gpm of evaporation per acre. To evaporate 2 000 gpd, 1.11 acre of pond surface would be required. The San Juan Power Generating Facility is actually measuring more than 3 gpm of evaporation per acre.

An evaporation pond would have the advantage of not requiring electrical energy to evaporate the RO concentrate stream. In contrast, it would present several disadvantages. There could be concerns of wind dispersion of concentrated radioactive materials in aerosols generated from wave action. Radioactive salts would accumulate in the pond and require periodic removal. Management of these solid residues in the pond could be more difficult than with a mechanical evaporator. The land area required for a pond and buffer zone is also considered a disadvantage for this technology given the scarcity of flat terrain near TA-50.

Option IV-2

RO concentrate ⇒ mechanical evaporator

Another option for reducing the volume of the RO concentrate stream is use of a mechanical evaporator. A vapor-compression brine concentrator evaporator was considered. This equipment would use electric energy to distill the concentrate. The cost of energy is minimized by recondensing the distillate vapor to a liquid for heat recovery. After heat recovery, the high quality distillate would be combined with the RO product water for reuse.

At the 2 000 gpd flow estimated for the RO concentrate, the estimated annual energy cost of approximately $3 800 is moderate. A conceptual-level budget estimate for a skid-mounted brine concentrator evaporation system is $850 000, exclusive of design costs, installation, or housing. The evaporator column itself is well insulated and may be located inside a building or outdoors. Some peripheral components and controls would best be installed inside a building for weather protection and ease of maintenance.

The evaporator bottom blow-down, estimated at approximately 40 gpd would amount to approximately 2% of the original concentrate volume. The blow-down, containing virtually all of the dissolved contaminants remaining after ultra-filtration, would then be solidified with Portland cement for disposal at TA-54, Area G. A number of engineering issues associated with heat evaporation of the Laboratory's radioactive liquid waste concentrate will need to be evaluated during the Phase I through III operational period. A detailed characterization will be required of the concentrate stream's chemistry under actual operating conditions. This characterization must address potential safety concerns associated with heating concentrated mixtures of organic and inorganic constituents. The working group considers the proposed Phase III programs to characterize and limit potentially hazardous constituents in the influent streams essential precursors to any program involving industrial reuse of the treated RLW.

Phase V Upgrade: Eliminate Treated Radioactive Liquid Waste Discharge to the Environment

Eliminating liquid discharge of the treated radioactive liquid waste will occur in the Phase V upgrade. Four options are presented. The liquid discharge will be eliminated by evaporation.

Elimination of Liquid Discharge

Option V-1

Effluent $\Rightarrow$ land application

One evaporative alternative involves land application of the treated effluent. The irrigation field would be large enough, and designed and operated in such a way so that no runoff is produced and no water percolates into ground water. On an annual net basis, all applied water would be evaporated directly or transpired by vegetation.

As long as effluent is not discharged to a watercourse, an NPDES point source permit is not needed. It is possible, however, that the EPA would choose to regulate land application of nonradioactive constituents under the Laboratory's storm water NPDES permit. NMED approval of a ground water discharge plan would still be required, as it is for the current RLWTF discharge to Mortandad Canyon, to demonstrate that the system did not adversely impact ground water. Residual contaminants discharged with the effluent would accumulate slowly over time in the land application area soil. This accumulation would not represent a major environmental risk because in Phase IV the effluent would have been pre-treated to near-drinking-water quality before land application.

Land application of treated radioactive liquid waste would require an irrigated area of approximately 6.9 acres. A large storage volume would be required to hold the effluent during cold months when the soil is frozen and irrigation is not possible. A winter storage reservoir of approximately 2.65 million gal. would be required, assuming a very conservative six-month storage requirement. This storage reservoir could be either an aboveground steel tank or a lined pond approximately 1.4 acres in area with a 6-ft depth.

A relatively flat irrigation site would be required to avoid surface runoff. Spray irrigation would maximize evaporation and a dedicated buffer area surrounding the irrigation field would be needed to avoid wind drift of spray onto other areas. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

The principal advantages of land application are the ability to dispose of liquid without surface water or ground water contamination or evaporative energy costs. On the other hand, land application systems involve liquid discharge to the environment and cannot properly be described as a zero liquid discharge system. A prominent disadvantage of land application is the relatively large area of flat land required. Another disadvantage is that the effluent would not be recycled for industrial purposes and subsequent savings of potable water.

Option V-2

Effluent $\Rightarrow$ pond/wetlands

An evaporation pond sized to handle 20 000 gpd of treated radioactive liquid waste would need to be approximately 10 acres in surface area. A combined evaporation pond/wetlands would also require about 10 acres of land area. The advantages and disadvantages of either the evaporation pond or the evaporation pond/wetlands are the same as those mentioned in Scenario IV-1. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Option V-3

Effluent ⇒ cooling tower

Evaporating the RO permeate in a dedicated cooling tower or in a tower at a LANL facility is possible. Several small cooling towers exist near TA-50. The evaporation rate from LANL cooling towers is about 1% of the recirculation rate per 10^0F temperature change. Using this assumption, a recirculation rate of 1 400 gpm is estimated to evaporate the 20 000 gpd of RO permeate from treatment operation at the RLWTF.

Because the TDS in the RLWTF effluent water will be quite low, concentration factors higher than those normally found in cooling towers could be obtained. It is reasonable to expect that a concentration factor of 10 could be obtained prior to blow-down. This would require about 2 000 gpd of blow-down to be recirculated to the RLWTF influent holding tanks for treatment.

Any tritium remaining in the effluent after Phase III would be released to the atmosphere while the nonvolatile constituents would be returned to the RLWTF in the cooling tower blow-down. Drift, the fine droplets of liquid dispersed from a cooling tower, would contain low concentrations of actinides. This activity could be as high as 12 pCi/L, assuming the cooling tower was operated at 10 cycles of concentration and the makeup water had 1.2 pCi/L of plutonium and americium. Discharge of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Option V-4

Effluent ⇒ mechanical evaporator

A mechanical evaporator that could evaporate the entire 20 000 gpd RO permeate would likely be a scaled-up version of the mechanical evaporator suggested in alternative IV-2. A significant difference is that the evaporated water will not be recondensed and therefore, energy from recondensation will not be available to help evaporate more water. This would result in a very energy-inefficient evaporator, but would result in zero liquid discharge of the liquid effluent. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Figure 12 illustrates the course this working group proposes LANL follow to achieve the goal of zero liquid discharge of treated radioactive liquid waste.

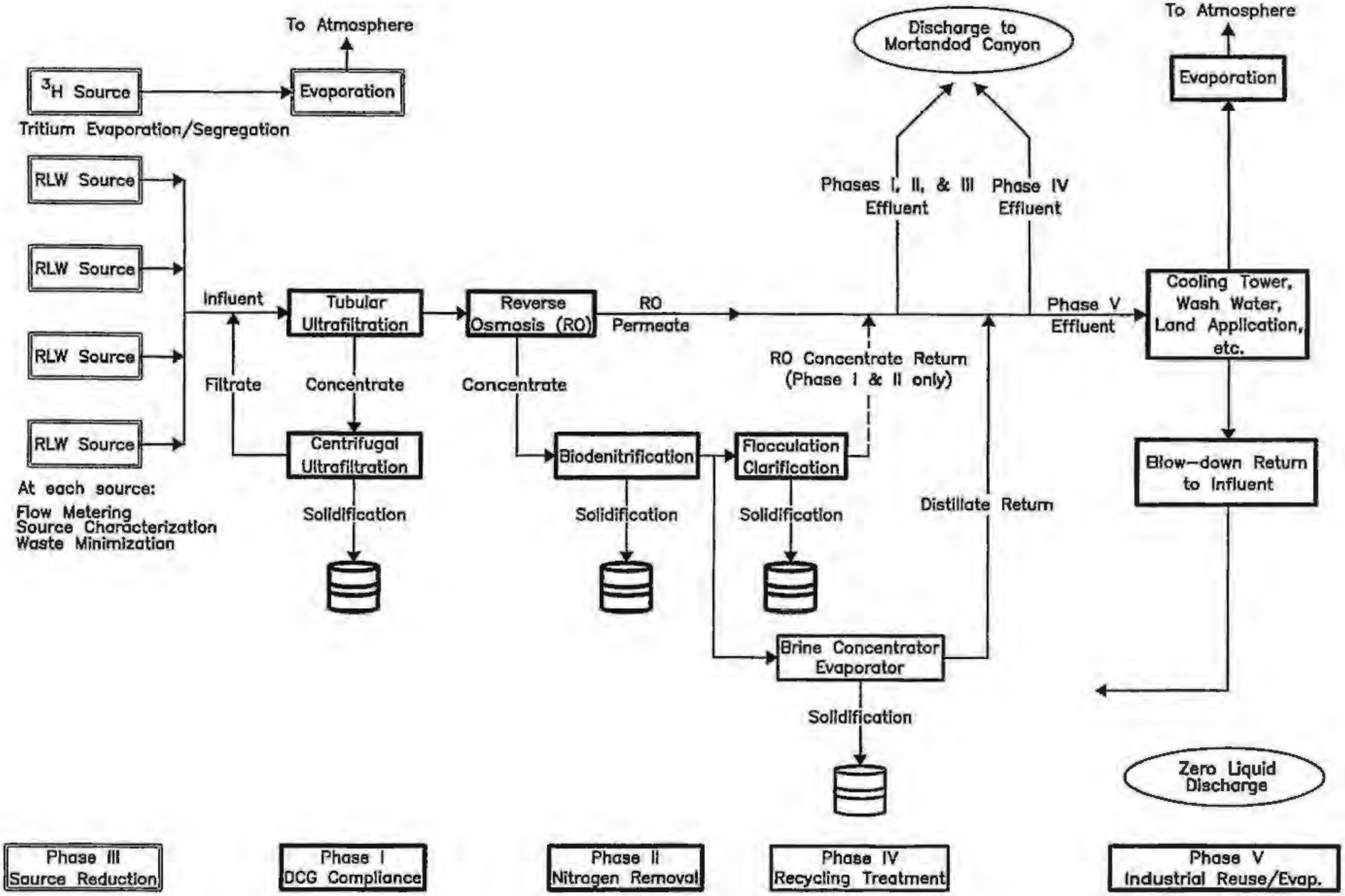

Figure 12. Conceptual phases for implementation of zero liquid discharge at the RLWTF.

SUMMARY OF RECOMMENDATIONS

This report defines the steps that LANL must follow to achieve zero liquid discharge of treated radioactive liquid waste from outfall 051. These recommendations encompass a broad spectrum of radioactive liquid waste management efforts involving waste characterization, liquid waste volume reduction, source minimization of regulated constituents, reuse and recycle, evaporation technologies, and placing of constituents in their most environmentally benign state.

Recommendations Pertaining to Phase I and Phase II Upgrades

1. Newly installed Phase I and II upgrades at the RLWTF should be run as a full-scale pilot project to develop engineering design parameters that would be used to design a new radioactive liquid waste treatment facility.
2. Treated radioactive liquid waste effluent from the RLWTF should not be discharged to the SWSC plant
3. The proposed Phase II biodenitrification facilities should be constructed as planned.

Recommendation Pertaining to Construction of a New RLWTF

1. Design, fund, and construct a modern treatment facility that has redundant process equipment with capability to treat LANL's radioactive liquid waste for the next 30 years.

Recommendations Pertaining to Phase III

1. Tritium sources should be identified and isolated from the RLWTF collection system. The Laboratory should voluntarily construct facilities to evaporate tritiated wastewaters. Isolating the tritiated TSTA and TSFF waste streams from the influent to the RLWTF would make it possible to remove the cross-country radioactive liquid waste pipeline from TA-21 to TA-50.
2. The Laboratory should aggressively minimize the mass of pollutants at their sources, strengthen enforcement of the RLWTF WAC, and improve monitoring of the RLWTF influent at the sources.

Phase IV Recommendations

1. The Laboratory should design and construct facilities to further improve the quality of the RLWTF effluent by removing the pollutants contained in the RO concentrate stream from the effluent discharged to Mortandad Canyon. This will result in discharge of water of near-drinking-water quality
2. Evaporation processes, such as solar ponds and mechanical evaporation, should be investigated as a method of removing dissolved solids from the liquid phase.
3. Solidification technologies should be studied.

4. Minimization of waste stream volume by electrodialysis reversal and ion exchange should be studied.
5. Liquid effluent should continue to be discharged to Mortandad Canyon until zero discharge is implemented. The outfall 051 NPDES permit should be kept for the RLWTF in the event of potential need resulting from operational upsets or dramatic changes in the Laboratory's mission.

Phase V Recommendations

1. The Laboratory should eliminate all discharges of treated liquid radioactive waste to the environment.
2. Radioactive wastewater should be treated to near-drinking-water quality and recycled for reuse in industrial processes or evaporated. Reuse and recycle options for the treated radioactive liquid waste should be identified. Evaporation methods for the treated radioactive liquid waste (evaporation ponds, constructed wetlands, land application, cooling towers, and mechanical evaporators) should be compared.

REFERENCES

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Purtymun, W. D., J. R. Bucholz, and T. E. Hakonson, "Chemical Quality of Effluents and Their Influence on Water Quality in a Shallow Aquifer," *Journal of Environmental Quality* **6** no. 1, 29-32 (1977).

Purtymun, W. D., R. W. Ferenbaugh, and M. Maes, "Quality of Surface and Ground Water at and Adjacent to the Los Alamos National Laboratory: Reference Organic Compounds," Los Alamos National Laboratory report LA-11332-MS (1988).

Resource Technologies Group, Inc., "Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation, Final Report," (January 4, 1996).

Resource Technologies Group, Inc., "Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation, Technical Memorandum and General Reference Documents" (February 15, 1995).

Stoker, A. K., W. D. Purtymun, S. G. Mc Lin, and M. N. Maes, "Extent of Saturation in Mortandad Canyon," Los Alamos National Laboratory report LA-UR-91-1660 (1991).

US Department of Energy, "Radiation Protection of the Public and the Environment," DOE Order 5400.5 (February 8, 1990), Change 2 (January 7, 1993).

Water Quality Code for the Pueblo of San Ildefonso (1991).

Enclosure 8

EXHIBIT

tabbies

B

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: September 3, 1998
In Reply Refer To: ESH-18/WQ&H:98-0256
Mail Stop: K497
Telephone: (505) 667-7969

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: SUMMARY OF JULY 31, 1998, MEETING AT LANL AND STATUS REPORT ON RLWTF UPGRADES

Dear Ms. Bustmante:

We would like to take this opportunity to review for you the key points from the July 31, 1998, meeting which you and Mr. John Gillentine (NMED) attended at Los Alamos National Laboratory.

The principal items on the agenda at the July 31, 1998, meeting were the presentations by David Rogers (ESH-18) on the hydrogeology of Mortandad Canyon, and by David Broxton (EES-1) and Pat Longmire (CST-7) on the recent findings from the drilling of wells R-9 and R-12. Plans for the proposed drilling of well R-15 (Mortandad Canyon) were also reviewed. Under the current schedule, drilling at R-15 will begin in September 1998. Please direct any additional questions you may have regarding these presentations to Bob Beers and he will forward them to the appropriate presenter.

Following the above presentations, Neil Williams (ESH-18) described for you and Mr. Gillentine the problems which the Laboratory is currently encountering with SKF, Inc., the vendor for the Phase II biodenitrification equipment. SKF, Inc. is unable to meet its contractual obligations and deliver the required equipment. As a result, due to circumstances beyond the Laboratory's control, completion of the Phase II upgrades has been delayed despite substantial expenditures and the Laboratory's efforts to remain on schedule.

Neil Williams also provided you with a copy of the Laboratory's recent report, "Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility" (Moss, D., Williams, N., et al., LA-13452-MS, LANL, June 1998). The report presents conceptual level recommendations for future upgrades to the Radioactive Liquid Waste Treatment Facility (RLWTF) and at the generating sites which would allow the Laboratory to implement a complete reuse or evaporation of the treated radioactive liquid waste (RLW) resulting in a zero liquid discharge of RLW effluent.

The Phase I process upgrades (ultrafiltration and reverse osmosis) to the RLWTF have been installed. Recently, several safety concerns have been identified by the plant's operators which can be corrected through modifications to the Phase I equipment. The Laboratory has determined that in order to minimize potential exposure to radioactive liquids, these modifications should be completed and tested before the Phase I upgrades are placed into services with RLW. As a result, the Phase I upgrades will not be treating RLW until January 1999.

Over the past weeks, DOE and Laboratory management have met to address the Phase II upgrades (nitrate removal) and compliance with state ground water standards. Both DOE and Laboratory management are in agreement that due to the recommendations made in the report, alternatives to biodenitrification should be considered for nitrate removal if they will enable the Laboratory to pursue zero liquid discharge in the near future. As a result, the Laboratory has initiated an engineering study to evaluate the alternatives available to reach both the short-term objective of nitrate compliance and the ultimate goal of zero liquid discharge. The completion date for the Phase II upgrades cannot be projected until this engineering study is completed. Preparation of the study is expected to take six to eight weeks. Most importantly, senior DOE and Laboratory management have made commitments to allocate the resources necessary to provide implementation of nitrate removal at the RLWTF at the earliest possible date.

In closing, we have been asked by senior management at DOE and the Laboratory to request a meeting with management from the NMED Ground Water Bureau. The objective of the meeting would be to discuss the issues presented in this letter and to communicate the Laboratory's commitment to accelerate the completion date for the Phase II upgrades.

Please contact Bob Beers of the Water Quality and Hydrology Group at 667-7969 if you would like further information on these matters.

Sincerely,

Steve Hanson
Radioactive Liquid Waste Operations

Sincerely,

Steven Rae
Water Quality and Hydrology Group

BB/md

Cy: M. Leavitt, NMED/GWQB, Santa Fe, New Mexico
D. Doremus, NMED/GWQB, Santa Fe, New Mexico
J. Davis, NMED/SWQB, Santa Fe, New Mexico
J. Vozella, DOE/LAAO, MS A316
B. Koch, DOE/LAAO, MS A316
T. Baca, EM-DO, MS J591
D. Erickson, ESH-DO, MS K491
K. Hargis, EM/WM, MS J591
N. Williams, ESH-18, MS K497
B. Beers, ESH-18, MS K497
D. Moss, EM/RLW, MS E518
P. Worland, EM/RLW, MS E518
D. Woitte, LC/GL, MS A187
WQ&H File, MS K497
CIC-10, MS A150

EXHIBIT

C

Los Alamos National Laboratory

Environment, Safety, and Health Division
P.O. Box 1663, Mail Stop K491
Los Alamos, New Mexico 87545
(505) 667-4218 / FAX: (505) 665-3811

Date: March 18, 1999
Refer to: ESH-DO:99-48

Mr. Samuel Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. In accordance with Part III.D.1.a. of the NPDES Permit issued to the Laboratory on August 1, 1994, I am providing this notification regarding the installation of planned upgrades and changes in the waste streams contributing to the effluent flow at the Technical Area 50, Radioactive Liquid Wastewater Treatment Facility (TA-50 RLWTF).

DCG,

In order to meet the Department of Energy's Derived Concentration Guidelines (DOE DCGs) concerning radioactive constituents established by DOE Order 5400.5 and to meet ground water discharge requirements for nitrate established by the New Mexico Water Quality Control Commission (NMWQCC) Regulations, the TA-50 RLWTF is upgrading its current treatment processes. Upgrades include tubular ultrafiltration followed by reverse osmosis (RO). These upgrades will enable the TA-50 RLWTF to meet the DOE DCGs. The treatment process upgrades have been installed and tested on non-radioactive water and are expected to begin operation with radioactive water in March, 1999. The above mentioned TA-50 RLWTF upgrades were included in the Laboratory's NPDES Permit Re-Application submitted on May 4, 1998, and in a Notice of Changed Condition letter to the EPA dated February 14, 1997.

Compliance at the TA-50 RLWTF outfall with the NMWQCC ground water standard for nitrate will be attained by March 21, 1999, by generator restrictions on nitrogen containing wastes and by a chemical denitrification treatment process. The Laboratory has selected mechanical evaporation as the long-term process for the removal of essentially all the salts and contaminants in the reverse osmosis reject stream. It is the Laboratory's goal to have a mechanical evaporator operational within 18 months. The mechanical evaporator also will support the Laboratory's goal of zero liquid discharge of effluent from the TA-50 RLWTF.

To ensure compliance with the NMWQCC ground water standard for nitrate, the Laboratory will implement a short-term operational plan until the mechanical evaporator becomes operational. The short-term operational plan involves the temporary storage of this liquid. Temporary storage of the acid and caustic process streams from TA-55 is also an integral part of the interim operational plan.

The Laboratory is planning to pretreat small quantities of highly concentrated nitrate waste streams using a non-thermal chemical denitrification process that converts nitrate to nitrogen gas. The chemical denitrification process will treat approximately 120 gallons per month of nitrogenous chemical waste and discharge the treated wastewater to the headworks of the TA-50 RLWTF (See Attachment). A description of the treatment process is enclosed for your review. Please note, the treatment process description is proprietary material and should be handled as "Official Use Only" information. The Laboratory expects the chemical denitrification process to be operational by late March or early April, 1999. The Laboratory is providing this notice because the chemical denitrification process was not included in the Laboratory's Permit Re-Application dated May 4, 1998. The upgrades to the TA 50 RLWTF will significantly improve effluent discharged at Outfall 051.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 if you have any questions or need additional information.

Sincerely,

Dennis J. Erickson
Division Director
Environment, Safety, and Health Division

Sincerely,

Thomas E. Baca
Division Director
Environmental Management Division

DJE:TEB:MS/em

Enclosures: a/s
Attachments: a/s

Cy: E. Spencer, USEPA, Region VI, Dallas, Texas, w/att.
S. Wilson, USEPA, Region VI, Dallas, Texas, w/att.
M. Leavitt, NMED/GWPB, Santa Fe, New Mexico, w/att.
P. Bustamante, NMED/GWPB, Santa Fe, New Mexico, w/att.
B. Garcia, NMED/HRMB, Santa Fe, New Mexico, w/att.
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T. Baca, EM-DO, w/att., MS J591
T. Stanford, EM-SWO, w/att., MS J595

Cy (continued):

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P. Worland, EM-RLW, w/att., MS E518
D. Moss, EM-RLW, w/att., MS E518
I. Triay, CST-7, w/att., MS J514
R. Michelotti, CST-7, w/att., MS H514
J. Dziewinski, CST-7, w/att., MS J514
S. Rae, (ESH-18/WQ&H:99-0036), ESH-18, w/att., MS K497
M. Saladen, ESH-18, w/att., w/enc., MS K497
B. Beers, ESH-18, w/att., w/enc., MS K497
T. Sandoval, ESH-18, w/att., MS K497
H. Decker, ESH-18, w/att., MS K497
N. Williams, ESH-18, w/att., MS K497
A. Puglisi, ESH-19, w/att., MS K490
D. Post, NMT-DO, w/att., MS G745
D. Woitte, LC-GEN, w/att., MS A187
CIC-10, w/att., MS A150
ESH-DO File, w/att., MS K491
WQ&H File, w/att., MS K497

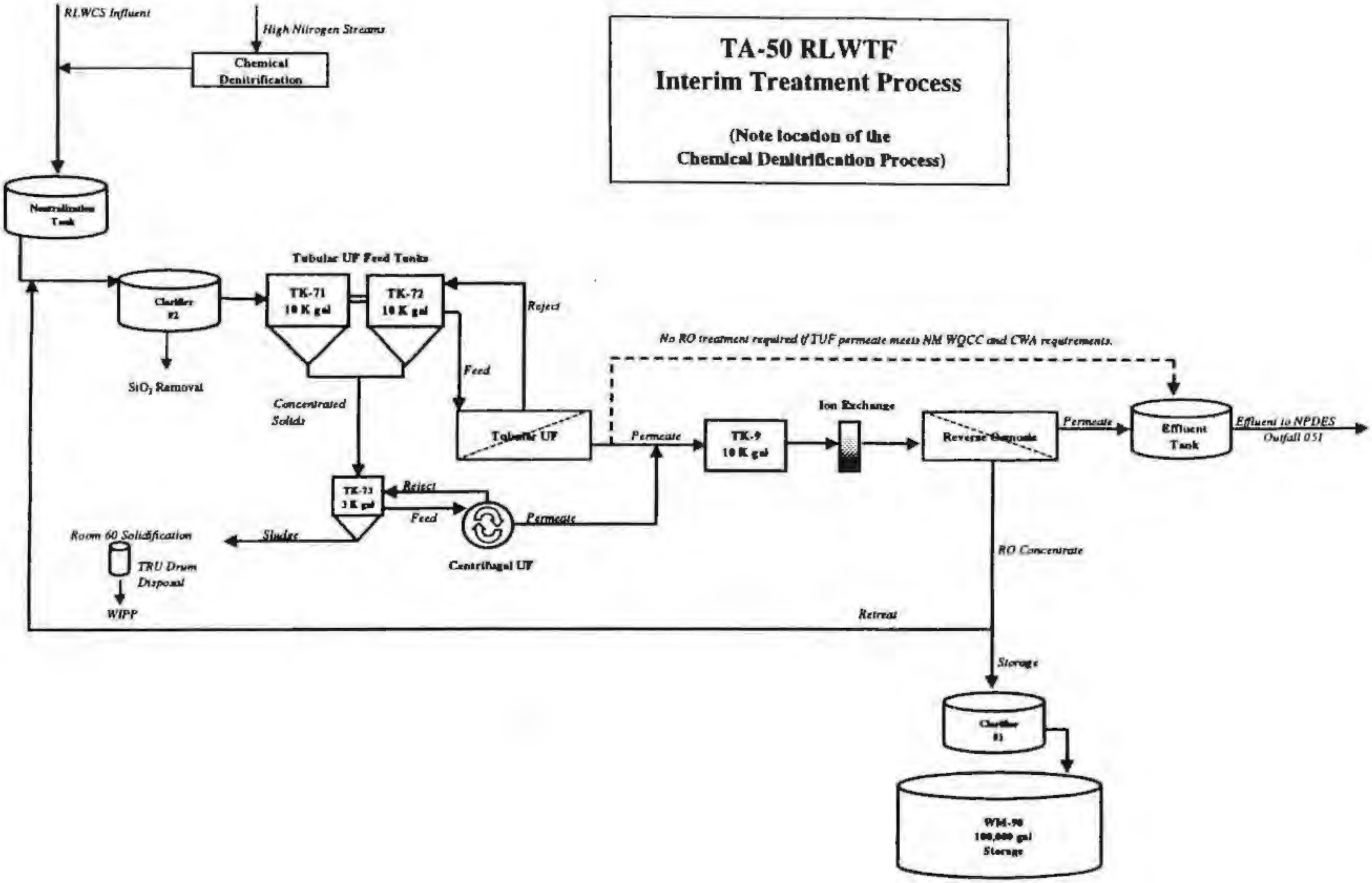
TA-50 RLWTF
Interim Treatment Process
(Note location of the
Chemical Denitrification Process)
RLWCS Influent
High Nitrogen Streams
Chemical Denitrification
Neutralization Tank
Clarifier #2
SiO_2 Removal
Tubular UF Feed Tanks
TK-71 10 K gal
TK-72 10 K gal
Reject
Feed
Concentrated Solids
Tubular UF
No RO treatment required if TUF permeate meets NM WQCC and CWA requirements.
Permeate
TK-9 10 K gal
Ion Exchange
Reverse Osmosis
Permeate
Effluent Tank
Effluent to NPDES Outfall 051
TK-73 3 K gal
Reject
Feed
Permeate
Centrifugal UF
Room 60 Solidification
Sludge
TRU Drum Disposal
WIPP
RO Concentrate
Retreat
Storage
Clarifier #1
WM-90 100,000 gal Storage

EXHIBIT D

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: December 22, 1999
In Reply Refer To: ESH-18/WQ&H:99-0481
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NPDES PERMIT NO. NM0028355, NOTICE OF CHANGED CONDITIONS AT OUTFALL 051

Dear Mr. Coleman:

The Los Alamos National Laboratory's (Laboratory) NPDES Permit No. NM0028355 requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. I am providing the following information in accordance with Part III.D.1.a. of the NPDES Permit issued to the Laboratory on June 24, 1994.

The Laboratory's TA-50 Radioactive Liquid Wastewater Treatment Facility (RLWTF) intends to start using two portable steel tanks (approximately 20,000 gallons each) with glass lining for the storage of effluent water produced during treatment. The location of these tanks is in Room 34B at the RLWTF (See Attachment 1). Room 34B is in an enclosed room with containment and a floor drain connecting to the inlet piping of the influent storage tanks. The tanks are inter-connected with overflow piping. Room 34B had previously been used for radioactive decontamination of large objects such as trucks.

The treatment of wastewater at the RLWTF will remain the same and the effluent will continue to be discharged in a batch method after filling and sampling the tanks for regulatory compliance. The outlet of these tanks are connected to the existing discharge pumps inlet piping manifold which allows the permitted NPDES sampling point, flow meter, and pH detection/recording device to be used. This also allows the flexibility of recirculation of the wastewater for further treatment, if necessary. The discharge point to Montandad Canyon will not change.

This request is being made to allow the RLWTF the opportunity to provide additional effluent storage capacity at the RLWTF. This additional capacity will allow more time for analysis of the wastewater before discharge to the environment.

On December 7, 1999, Mike Saladen of the Laboratory's Water Quality and Hydrology Group (ESH-18) discussed this information with Mr. Scott Wilson of your staff. Mr. Saladen indicated that the addition of these portable tanks would not alter the treatment or compliance sampling location at the RLWTF, or change the discharge location into Mortandad Canyon. Mr. Wilson advised Mr. Saladen to submit this information in writing to EPA and the New Mexico Environment Department-Surface Water Quality Bureau.

Please contact me at (505) 665-1859 or Mike Saladen at (505) 665-6085 if you have questions or need additional information.

Sincerely,

for Steven Rae
Group Leader
Water Quality and Hydrology Group

SR:MS/em

Attachments: a/s

Cy: E. Spencer, EPA, Region 6, w/att., Dallas, Texas
S. Wilson, EPA, Region 6, w/att., Dallas, Texas
B. Hoditschek, NMED/SWQB, w/att., Santa Fe, New Mexico
J. Vozella, DOE/LAAO, w/o att., MS A316
B. Enz, DOE/LAAO, w/o att., MS A316
T. Gunderson, DLDOPS, w/o att., MS A100
T. Standford, FWO-DO, w/o att., MS K492
S. Hanson, FWO-DO, w/o att., MS K492
D. McLain, FWO-RLW, w/o att., MS E518
D. Moss, FWO-RLW, w/o att., MS E518
D. Woitte, LC-GEN, w/att., MS A187
D. Erickson, ESH-DO, w/o att., MS K491
M. Saladen, ESH-18, w/att., MS K497
B. Beers, ESH-18, w/att., MS K497
WQ&H File, w/att., MS K497
CIC-10, w/att., MS A150

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NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: June 13, 2000
In Reply Refer To: ESH-18/WQ&H:00-0194
Mail Stop: K497
Telephone: (505) 665-1859

EXHIBIT
E

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

On April 3, 2000, the Los Alamos National Laboratory notified (Letter ESH-18/WQ&H:00-0126) the U. S. Environmental Protection Agency (EPA) regarding a change in the waste streams contributing to the effluent discharged from NPDES Outfall 051 at the Technical Area 50, Radioactive Liquid Wastewater Treatment Facility (RLWTF).

In order to meet the Department of Energy's (DOE) Derived Concentration Guidelines (DCGs) concerning radioactive constituents established by DOE Order 5400.5 and to meet ground water discharge requirements for nitrate and other parameters established by the New Mexico Water Quality Control Commission (NMWQCC) Regulations, the RLWTF upgraded its treatment processes in a two-phased project. Phase I, installation of the Tubular Ultrafiltration and Reverse Osmosis treatment units, was completed in November, 1999. Phase II, installation of the Electrodialysis Reversal (EDR) treatment unit and the interim mechanical evaporator, was completed in January, 2000. The upgrades have significantly improved effluent quality at the RLWTF.

During the start-up of the interim mechanical evaporator, the Laboratory collected approximately 640 gallons of evaporator cleaning solutions, rinsewater, and solids from the cleaning of the mechanical evaporator's heat exchanger. The wastewater contained residual waste from the treatment units prior user, the Barnwell Nuclear Fuel Plant, in Barnwell, South Carolina. The wastewater and solids were collected during three cleaning events, which were stored separately in three 300-gallon tuff tanks (Tanks 1, 2, and 3). Tank 1 was filled with approximately 175 gallons of acid wash and rinsewater from the first cleaning event. The wastewater in the tank originated from the evaporator's heat exchanger before radioactive wastewater from the RLWTF was fed into the evaporator. Analysis of the wastewater documented elevated levels of gross alpha, beta, and gamma radioactivity. Tank 2 was filled with approximately 165 gallons of cleaning solutions and rinsewater from the second cleaning event. Elevated gross alpha and gross beta concentrations were also detected in Tank 2. Approximately 300 gallons of wastewater was stored in Tank 3 from the third cleaning event. Wastewater in Tank 3 had concentrations of cadmium and chromium above RCRA regulatory limits before neutralization with sodium hydroxide. After neutralization, the chromium concentration dropped below the RCRA level, but cadmium remained at a concentration (5.8 mg/L) above the RCRA hazardous waste concentration. Additionally, radioactivity concentrations in the cleaning solution decreased. Analytical data for the wastewater for all tanks were enclosed with the April 3, 2000 letter. The Laboratory indicted in that letter that all three tanks would be decanted and discharged to the RLWTF head-works.

On March 31, 2000, the liquids in Tank 1 and Tank 2 were decanted to a tuff tank (Tank 5). Also, on that day, the liquid in Tank 3 was decanted to another tuff tank (Tank 6). The sludges remaining in the bottoms of Tanks 1, 2, and 3 were drummed and sent to Nuclear Sources and Services, Inc. (NSSI), near Houston, TX on April 25, 2000. The liquid in Tank 6 was sent to NSSI on April 27, 2000. At NSSI, additional sampling and solidification will take place on these sludges and liquids. Final disposition of the waste will be burial at Envirocare of Utah, Inc. The liquids in Tank 5 have not yet been discharged to the RLWTF headworks.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 if additional information would be helpful.

Sincerely,

Steven Rae

Steven Rae
Group Leader
Water Quality and Hydrology Group

MS/rm

Cy: E. Spencer, USEPA, Region VI, Dallas, Texas
S. Wilson, USEPA, Region VI, Dallas, Texas
J. Davis, NMED/SWQB, Santa Fe, New Mexico
B. Hoditscheck, NMED/SWQB, Santa Fe, New Mexico
M. Leavitt, NMED/GWQB, Santa Fe, New Mexico
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T. Gunderson, DLDOPS, MS A100
T. Stanford, FWO-DO, MS J595
B. Ramsey, FWO-DO, MS J595
D. McLain, FWO-RLW, MS E518
P. Worland, FWO-RLW, MS E518
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D. Moss, FWO-RLW, MS E518
D. Erickson, ESH-DO, MS K491
M. Saladen, ESH-18, MS K497
A. Jackson, ESH-19, MS K490
D. Woitte, UC-GEN, MS A187
WQ&H File, MS K497
CIC-10, MS A150

EXHIBIT
F

State of New Mexico
ENVIRONMENT DEPARTMENT
DOE OVERSIGHT BUREAU
P.O. Box 1663, MS/J-993
Los Alamos, New Mexico 87545

GARY JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

Jay Coghlan
Concerned Citizens for Nuclear Safety
107 Cienega St.
Santa Fe, NM 87501

May 12, 1999

Subject: **Status of Current and Planned Upgrades at the TA-50 Radioactive Liquid Waste Treatment Facility and the Ground Water Discharge Plan (DP-1132) Application**

Dear Mr. Coghlan:

We are responding to your March 29, 1999 request for information about status of current and planned upgrades at the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) and the associated Ground Water Discharge Plan (DP-1132) application. These responses are based upon our review of the Ground Water Discharge Plan, correspondence between NMED and the laboratory, and meetings with the laboratory and TA-50 personnel.

Your questions regarding TA-50 discharges during 1998 that exceeded New Mexico Water Quality Standards and DOE Derived Concentration Guidelines will require additional time. This also applies to your questions regarding TA-16. We will provide a response to those questions as soon as our data search and review is complete. If you have any questions regarding this response please contact Ralph Ford-Schmid or Bob Weeks at 827-1536.

Sincerely,

Tim Michael FOR SY

Steve Yanicak
NMED, DOE OB, LANL POC

cc with enclosures:
- Greg Lewis, NMED, Director, WWMD
- John Parker, NMED, Chief, DOE OB
- Jim Davis, NMED, Chief, SWQB
- James Bearzi, NMED, Chief, HRMB
- Marcy Leavitt, NMED, Chief, GWQB
- Joe Vozella, DOE/AIP/POC, MS A316
- Steve Rae, LANL, ESH-18, MS K490
- Steve Hanson, LANL, EM-RLW, MS E518

1. What is the current and planned status of retrofitting reverse osmosis equipment.
   - Is RO equipment now in the facility's "production" line?
   - If not, is there a time guaranteed by LANL? Please specify how RO equipment will improve the facility's performance.

Response:
The reverse osmosis (RO) is intended to remove water soluble (dissolved) constituents. The RO equipment has been installed, tested and went "hot" on April 7, 1999. The RO system will not be used "full time" until a pathway for the RO reject water is in place. Currently the RO reject stream is temporarily stored in Clarifier No. 1 (25,000 gallons) or WM-90 (100,000 gallons) at TA-50. Testing of the RO system has nearly exhausted this storage capacity for the RO reject water and will limit the use of the RO system until the Electrodialysis Reversal (EDR) and the Mechanical Evaporator are installed.

As part of their Ground Water Discharge Plan Application, LANL has submitted a project schedule (enclosed) for installation and start up of the proposed mechanical evaporator. The estimated ready-to-run date for the mechanical evaporator is February 28, 2000. It is, however, the Laboratory's goal to complete the project by December 22, 1999, if no appreciable delays are encountered.

Ultimately the RO reject stream will be fed into the EDR unit. The EDR will be used to concentrate the RO reject water prior to the Mechanical Evaporator. The EDR product water is routed back to the TA-50 headworks or back to the clarifier for reprocessing. The EDR concentrate is then routed to the mechanical evaporator. The distillate from the mechanical evaporator is sent to the effluent tanks for testing and discharged through NPDES outfall 051 or future re-use under the RLWTF's Zero Liquid Discharge Project. The evaporator bottoms, or solids, will be shipped to an off-site contractor for solidification and disposal or they will be solidified at TA-50 and disposed of at TA-54. See enclosed flow diagram (Figure 2.0).

2. What is the current and planned status of retrofitting ultrafiltration equipment.
   - When will ultrafiltration equipment be in the "production" line, at a time guaranteed by LANL?
   - To what extent will nitrate/nitrite, tritium and other water soluble constituents (please describe other constituents, as appropriate) be eliminated or greatly reduced?
   - Please specify how ultrafiltration equipment will improve the facility's performance.

Response:
The Tubular Ultrafiltration (TUF) equipment has been installed, tested and went "hot" on April 7, 1999. The TUF will continue to be used full-time and will remain the RWLTF's primary treatment unit until the RO can be used "full time". The TUF is not expected to be effective at reducing water soluble (dissolved) constituents, but it is very effective at removing particulate material. Until the RO system is in operation "full time" dissolved constituents will be present to some degree in the effluent.

The laboratory is currently using upstream controls (e.g., waste minimization, product substitution, and containerization) to reduce sources of nitrogenous wastes into the RLWTF. For example, the TA-55 Room 60 Process acid stream, which contains highly concentrated nitrogenous wastes, will be temporarily stored until the Nitric Acid Recovery System (NARS) is operational in June, 1999. These controls have resulted in significant reductions of nitrate/nitrite in the waste stream coming into the RWLTF and subsequently discharged in the effluent.

The laboratory plans to divert all tritiated water to TA-53 for treatment sometime in the near future (approximately 6 mos). The laboratory plans to install a solar evaporator to treat all tritiated waste (reactor and accelerator produced). The solar evaporator will replace the evaporation ponds at TA-53.

3. What is the general status of the RLWTF's Groundwater Discharge Plan?
   - Will measures to remediate existing contamination be incorporated into the Groundwater Discharge Plan?

Response:
The Ground Water Quality Bureau is reviewing LANL's responses to their requests for additional information to determine if the application is complete. The Environment Department Secretary will decide if a public hearing will be held to discuss DP-1132.

DP-1132 requires that if after two years of monitoring a series of wells in Mortandad Canyon, the groundwater quality does not meet WQCC standards, LANL will be required to submit a Groundwater Corrective Action Plan for NMED approval.

4. How does LANL guarantee that zero accelerator-produced tritium never enters the facility?

Response:
The Chemical Science and Technology Division, CST-13, has implemented a Waste Acceptance Criteria for the RLWTF that prohibits any waste generator from disposing of accelerator-produced tritium at the RLWTF. A Waste Profile Form (WPF) must be completed by each generator of waste prior to the acceptance of that waste stream at the RLWTF. The Radioactive and Industrial Wastewater Science group of CST-13 must approve the WPF before transfer to the Radioactive Liquid Waste Collection System. When the characteristics of a waste stream change, the waste generator must notify CST-13 and submit a new WPF for approval. In addition, the RLWTF Waste Acceptance Criteria places an upper-limit on the concentration of reactor-produced tritium allowed for treatment. The concentration of reactor-produced tritium allowed is 20,000 pCi/L.

5. Articles in the media indicated that LANL was considering instituting zero discharges for the RLWTF through the creation of a closed loop system.
   - What is the status of this concept?

Response:
The incentives for eliminating outfall 051, the regulatory and technical issues involved, and recommended steps to accomplish this goal are presented in a report published by LANL in 1998. The report, LA-13452-MS, 1998, is enclosed as an attachment to these responses. Many of the recommended steps have been completed or initiated. The biological process for nitrate removal, outlined in the report, has been replaced with the EDR and Mechanical Evaporator system. The installation of the EDR and the Mechanical Evaporator, to treat the RO reject water, is expected to result in a high quality RLWTF effluent capable of being recycled back to waste generators for re-use or use as cooling water supply.

Attachments

1) TA-50 RLWTF Interim Treatment Process
2) TA-50 RLWTF Final Treatment Process
3) Detailed Project Schedule
4) Radiation Liquid Waste Collection System
5) Sources of Liquid Waste to TA-50
6) LA-13452-MS Elimination of Liquid Discharge to the Environment for the TA-50 Radioactive Treatment Facility

Re: TA-50 Radioactive Liquid Waste Treatment Process

The radioactive liquid waste is initially treated by a tubular ultra-filtration unit. This removes most if not all solids and particulate material, producing a toothpaste-like waste which will be mixed with cement and disposed of at TA-54 as low-level rad waste or at WIPP as TRU-waste depending on the concentration of radioactive materials.

The effluent from the ultra-filtration unit is then processed by the reverse-osmosis (RO) system which removes most of the salts, and ionic forms of metals and radioisotopes. The RO system produces a permeate (nearly distilled water quality) and RO reject waste stream, containing the majority of the salts and dissolved contaminants.

This RO reject water will be temporarily stored at TA-50 until a permanent mechanical evaporator (an Electrodialysis Reversal [EDR] and a mechanical evaporator) is installed. LANL will, in the interim, purchase an off-the-shelf mechanical evaporator to treat the RO reject water. The RO reject water may also be sent to the existing clarifiers for chemical flocculation, precipitate settling, filtration, and solidification for radionuclide removal.

Ultimately LANL plans to treat RO reject water in a permanent mechanical evaporator. Their goal is to have the permanent system installed and operational in 18 months.

16 TOTAL STATIONS PROCESSED

	STA BEG	STA END	# OF OBS	# OF SAMPLE	STA END-PERIOD OF RECD IN YRS =0	<.5	<3	>=3
<1976	0	0	0	0	2770	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	2	2	4	4	0	2	0	0
1979	10	9	15	15	0	9	0	0
1980	0	0	1	1	0	0	0	0
1981	0	1	1	1	0	0	1	0
1982	0	0	0	0	0	0	0	0
1983	1	0	2	2	0	0	0	0
1984	0	0	2	2	0	0	0	0
1985	0	0	2	2	0	0	0	0
1986	0	0	1	1	0	0	0	0
1987	1	1	1	1	0	1	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	1	1	0	0	0	0
1991	0	1	3	3	0	0	0	1
1992	1	1	1	1	0	1	0	0
1993	1	1	1	1	0	1	0	0
1994	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0
TOTAL	16	16	35	35	2770	14	1	1

16 TOTAL STATIONS PROCESSED

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
01085 VANADIUM	V,DISS	UG/L	VERT		2	300.0000	80000.00	282.8400	500	100	92/04/01	93/08/03
			WATER		33	4788.900	1617E+05	12718.00	56300	52	78/05/16	91/10/31

TA-56

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

EXHIBIT G

Date: October 22, 2001
In Reply Refer To: ESH-18/WQ&H:01-353
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF CHANGED CONDITION AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

On June 13, 2000, Los Alamos National Laboratory notified (Letter ESH-18/WQ&H:00-0194) the U. S. Environmental Protection Agency (EPA) regarding a change in the waste streams contributing to the effluent discharged from NPDES Outfall 051 at the Technical Area 50, Radioactive Liquid Waste Treatment Facility (TA-50 RLWTF). In order to meet the Department of Energy's (DOE) Derived Concentration Guidelines (DCGs) concerning radioactive constituents established by DOE Order 5400.5 and to meet ground water discharge requirements for nitrate and other parameters established by New Mexico Water Quality Control Commission (NMWQCC) Regulations, the TA-50 RLWTF upgraded its treatment processes in a two-phased project. Phase I, installation of the Tubular Ultrafiltration and Reverse Osmosis treatment units, was completed in November, 1999. Phase II, installation of the Electrodialysis Reversal (EDR) treatment unit and the interim mechanical evaporator, was completed in January, 2000. These upgrades have significantly improved effluent quality at TA-50 RLWTF.

Provided as Enclosure 1 is the updated process schematic for the TA-50 RLWTF which includes the Phase I and Phase II upgrades. Additionally, reverse osmosis permeate and evaporator distillate with more than 20 nCi/l of tritium are trucked to the TA-53 Radioactive Liquid Wastewater Treatment Plant (TA-53 RLWTP) which makes use of solar evaporation. A process schematic for the TA-53 RLWTP is provided as Enclosure 2.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085, if additional information would be helpful.

Sincerely,

Steven Rae

Steven Rae
Group Leader
Water Quality and Hydrology Group

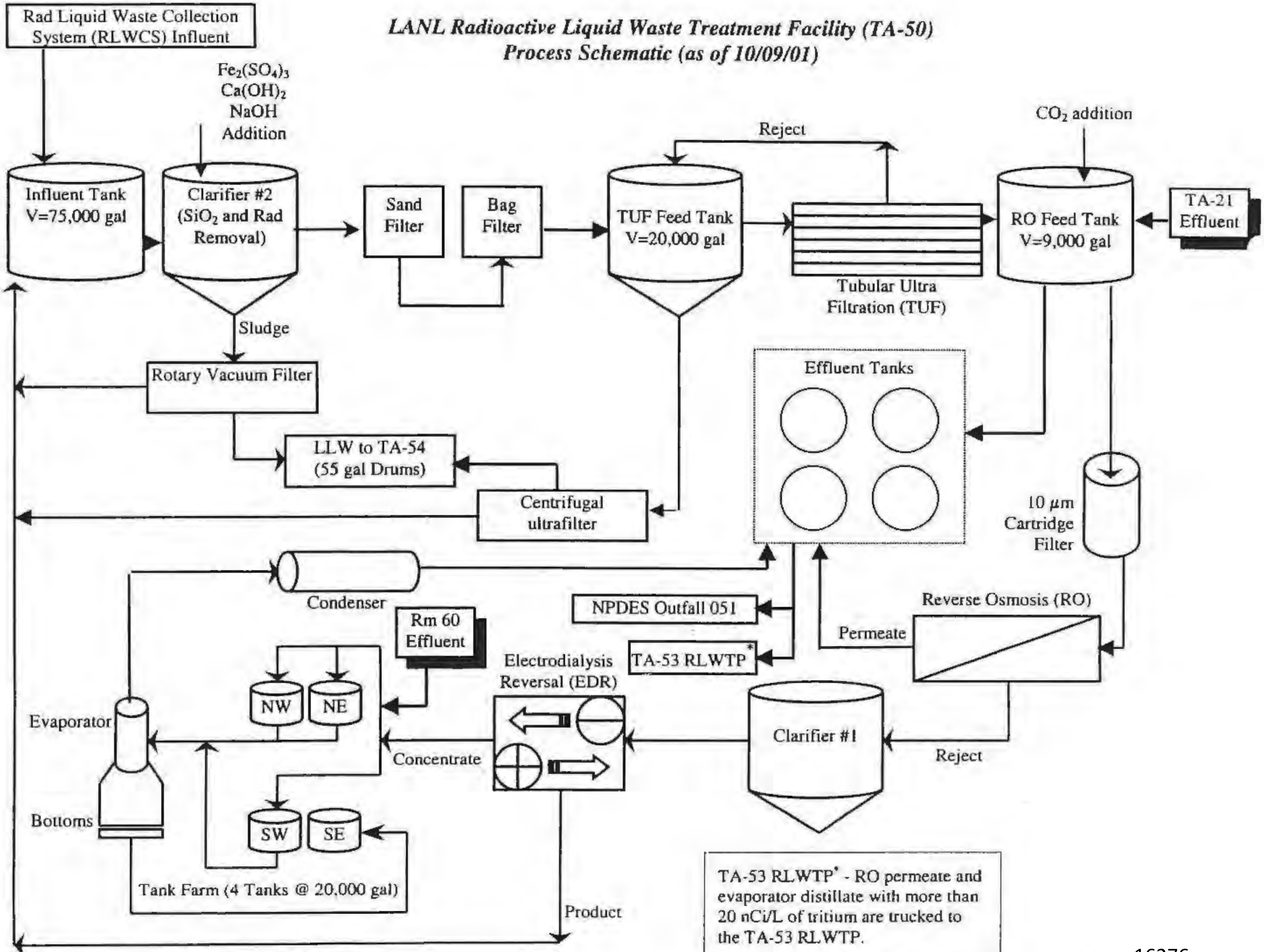
SR:MS/tml

Enclosures: a/s

Cy: E. Spencer, USEPA, Region VI, Dallas, Texas, w/enc.
S. Wilson, USEPA, Region VI, Dallas, Texas, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/LAAO, w/enc., MS A316
K. Agogino, DOE/AL, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
A. Standford, FWO-DO, w/enc., MS K492
B. Ramsey, FWO-DO, w/enc., MS K492
D. McLain, FWO-RLW, w/enc., MS E518
R. Alexander, FWO-RLW, w/enc., MS E518
L. McAtee, ESH-DO, w/enc., MS K491
P. Thullen, ESH-DO, w/enc., MS K491
D Stavert, ESH-DO, w/enc., MS K491
B. Beers, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
M. Bailey, ESH-18, w/enc., MS K497
D. Woitte, UC-GEN, w/enc., MS A187
WQ&H File, w/enc., MS K497
IM-5, w/enc., MS A150

ENCLOSURE 1

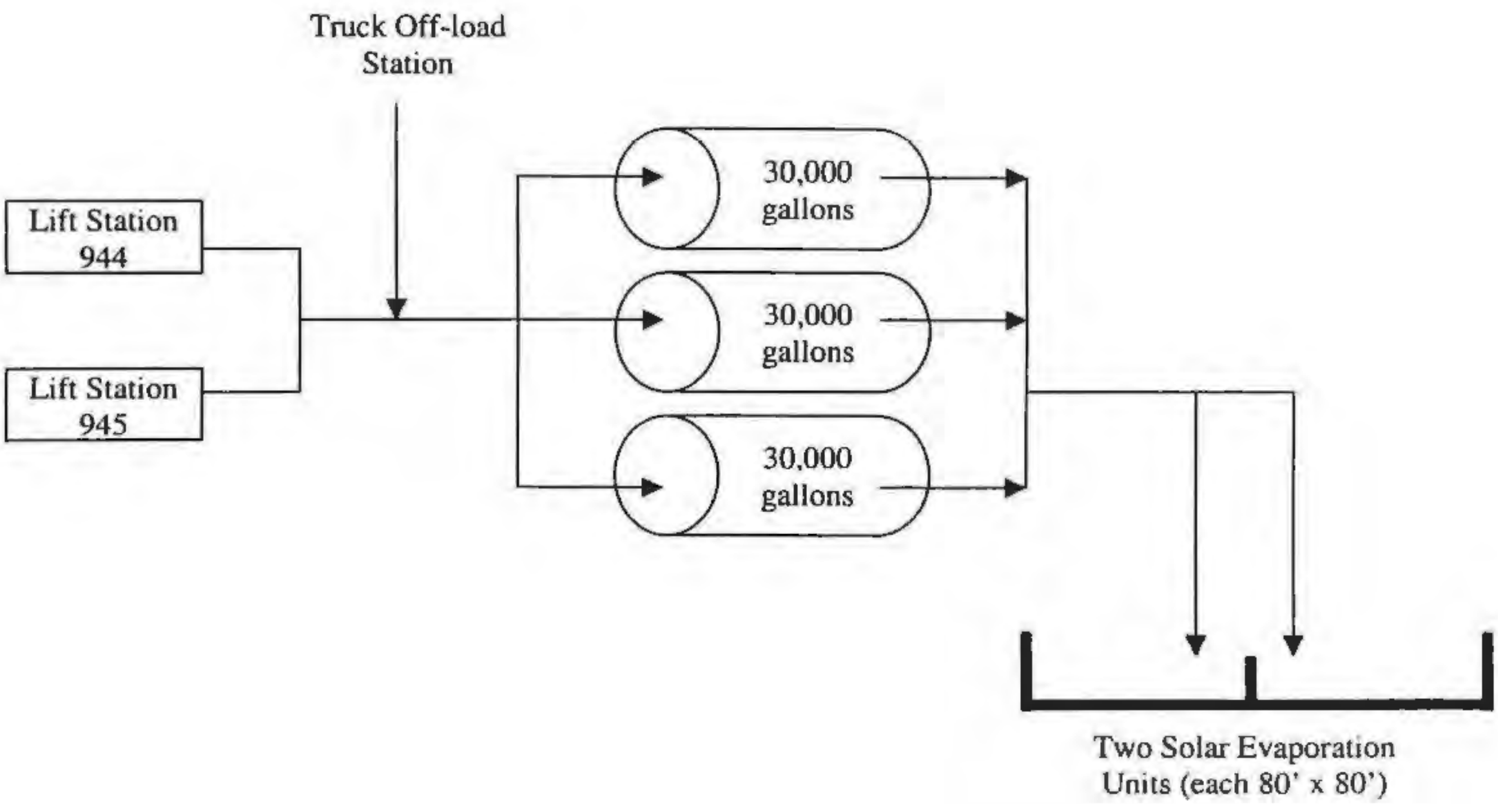
LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (as of 10/09/01)



TA-53 RLWTP* - RO permeate and evaporator distillate with more than 20 nCi/L of tritium are trucked to the TA-53 RLWTP.

ENCLOSURE 2

LANL Radioactive Liquid Waste Treatment Plant (TA-53)
Process Schematic (as of 10/09/01)



TA 50

EXHIBIT H

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: January 31, 2002
In Reply Refer To: ESH-18/WQ&H:02-025
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. In accordance with Section III.D.1.a. of the NPDES Permit issued to the Laboratory on February 1, 2001, we are providing this notification regarding the installation of the perchlorate treatment upgrade at the Technical Area 50, Radioactive Liquid Wastewater Treatment Facility (TA-50 RLWTF).

Pilot testing of ion exchange resins at the TA-50 RLWTF has demonstrated that perchlorate can be removed from effluent to below 4 parts per billion (ppb) on a bench-scale. The use of a full-scale ion exchange treatment process should substantially reduce perchlorate concentrations in the plant effluent.

A strong base anion exchange resin, Sybron Inc. SR-7, is proposed for use. This resin has proven capability to remove the perchlorate in the effluent for more than 15,000 bed volumes. Installation of a perchlorate removal process using 54 cubic feet of SR-7 ion exchange resin will remove perchlorate from 23 million liters of effluent. This is approximately equal to one year of radioactive liquid waste effluent from the facility. All tubular ultra-filter effluent will be treated by the ion exchange process to remove perchlorate. Effluent from the ion exchange process will then be discharged to the environment via NPDES Outfall 051 or will be sent for further processing by reverse osmosis (See Enclosure 1).

Six ion exchange vessels in a parallel flow arrangement are proposed. Each vessel will treat 11.7 gallons per minute. Total flow through the columns, therefore, will be 70 gallons per minute. Resin vessels showing breakthrough of perchlorate will be removed from service and replaced with a new vessel with fresh resin. Ion exchange resin with chemically attached perchlorate ions will be incinerated off-site. It is expected that the treatment upgrade to the TA-50 RLWTF will significantly improve effluent discharged at NPDES Outfall 051. Estimated completion date for this project is March 31, 2002.

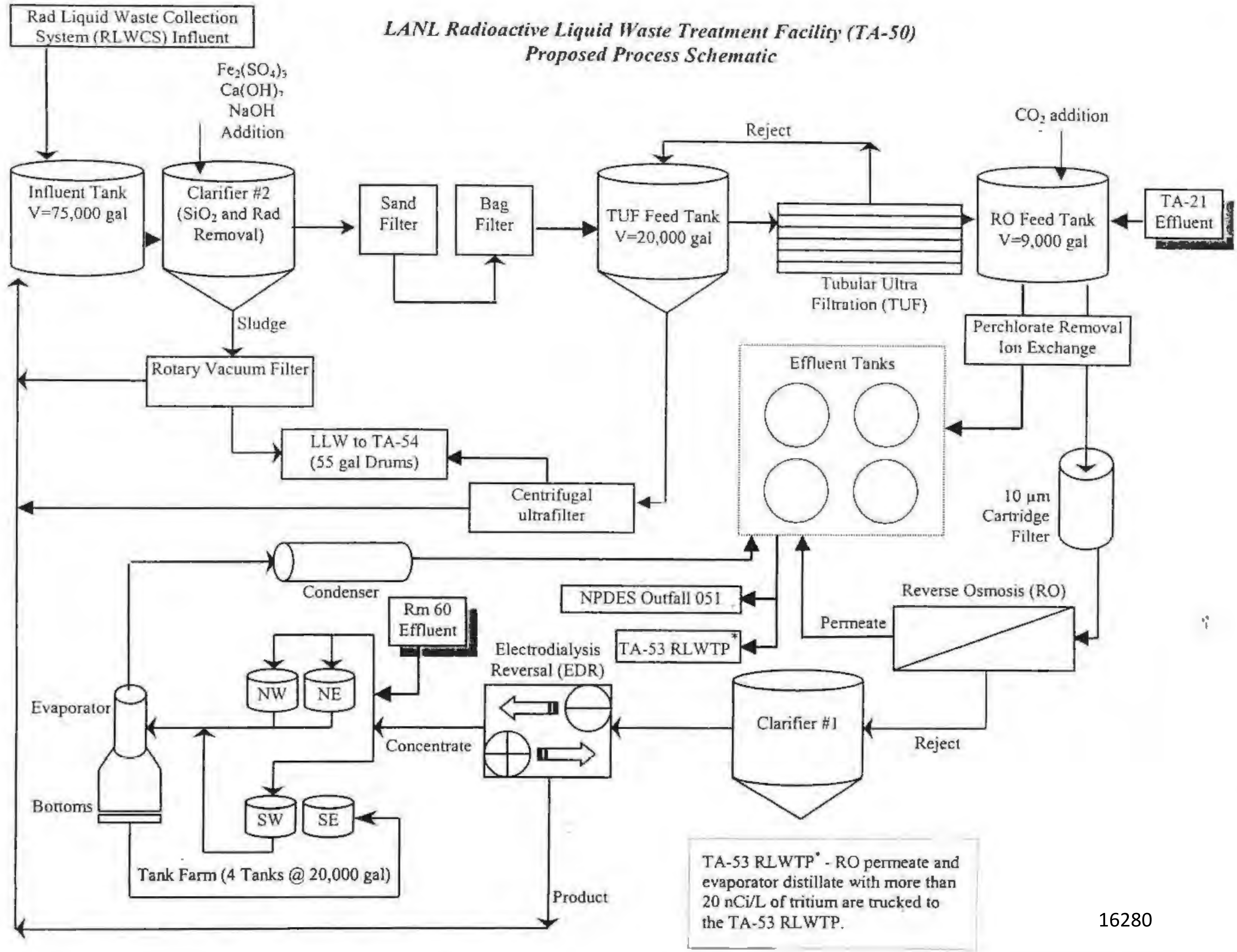
Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 if you have any questions or need additional information.

Sincerely,

Steven Rae
Water Quality and Hydrology Group

SR:MS/am

Cy: W. Strickley, USEPA, Region VI, Dallas, Texas, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
M. Leavitt, NMED/GWPB, Santa Fe, New Mexico, w/o enc.
J. Vozella, DOE/OLASO, w/o enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
D. McLain, FWO-WFM, w/o enc., MS E518
R. Alexander, FWO-WFM, w/enc., MS E518
P. Worland, FWO-WFM, w/enc., MS E518
D. Moss, FWO-WFM, w/enc., MS E518
L. McAtee, ESH-DO, w/o enc., MS K491
P. Thullen, ESH-DO, w/o enc., MS K491
D. Stavert, ESH-DO, w/o enc., MS K491
M. Saladen, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
T. Sandoval, ESH-18, w/o enc., MS K497
T. Grieggs, ESH-19, w/o enc., MS K490
D. Woitte, UC-GEN, w/o enc., MS A187
WQ&H File, w/enc., MS K497
IM-5, w/enc., MS A150


LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Proposed Process Schematic
Rad Liquid Waste Collection System (RLWCS) Influent
$Fe_2(SO_4)_3$
$Ca(OH)_2$
NaOH
Addition
Influent Tank V=75,000 gal
Clarifier #2 (SiO_2 and Rad Removal)
Sand Filter
Bag Filter
TUF Feed Tank V=20,000 gal
Reject
Tubular Ultra Filtration (TUF)
CO_2 addition
RO Feed Tank V=9,000 gal
TA-21 Effluent
Sludge
Rotary Vacuum Filter
Perchlorate Removal Ion Exchange
Effluent Tanks
LLW to TA-54 (55 gal Drums)
Centrifugal ultrafilter
10 μm Cartridge Filter
Condenser
NPDES Outfall 051
Reverse Osmosis (RO)
Rm 60 Effluent
Permeate
Electrodialysis Reversal (EDR)
TA-53 RLWTP*
Evaporator
NW
NE
Concentrate
Clarifier #1
Reject
Bottoms
SW
SE
Tank Farm (4 Tanks @ 20,000 gal)
Product
TA-53 RLWTP* - RO permeate and evaporator distillate with more than 20 nCi/L of tritium are trucked to the TA-53 RLWTP.

16280

LANL: Perchlorate ... Ralph Ford-Schmid
Copy: LANL TA-50

EXHIBIT
I

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 665-1859/Fax: (505) 665-9344

Date: May 7, 2002
Refer to: RRES-WQH: 02-177

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: PERCHLORATE TREATMENT INSTALLATION AT TA-50 RLWTF, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or the quantity of pollutants discharged. In accordance with Part III.D.1.a. *Reporting Requirements* of the Laboratory's NPDES Permit, the Laboratory notified EPA regarding the installation of perchlorate treatment units at the Technical Area 50, Radioactive Liquid Wastewater Treatment Facility (TA-50 RLWTF) on January 31, 2002 (Letter ESH-18/WQH:02-025).

On March 26, 2002, the TA-50 RLWTF began operating the Ion Exchange (IX) columns for perchlorate removal. On that day, approximately 2,000 gallons of treated water was processed through the IX columns. The concentration of effluent perchlorate was less than 4 ppb. Compliance monitoring for perchlorate in the TA-50 RLWTF's effluent will be reported in the Laboratory's Discharge Monitoring Reports (DMRs) in accordance with NPDES Permit requirments.

Also, personnel at the TA-50 RLWTF are conducting a study for the addition of a redundant and improved waste treatment membrane filtration system. The choice of a redundant and improved membrane filtration system will be determined by pilot testing small filtration units which employ different technologies. The performance of the pilot units will be compared to that of the full-scale Tubular Ultra-Filtration unit presently in use at the TA-50 RLWTF. The pilot filtration tests will be conducted from April, 2002 through July, 2002. The data obtained will enable personnel at the TA-50 RLWTF to select a membrane filtration technology that will best meet the discharge and operational requirements for a redundant, full-scale unit. Installation of new filtration treatment is expected during Fiscal Year 2003 (FY03). Enclosure 1 is the current treatment schematic for the TA-50 RLWTF, including perchlorate treatment. Enclosure 2 includes the proposed treatment schematic incorporating the redundant and improved membrane filtration technology.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 if additional information would be helpful.

Sincerely,

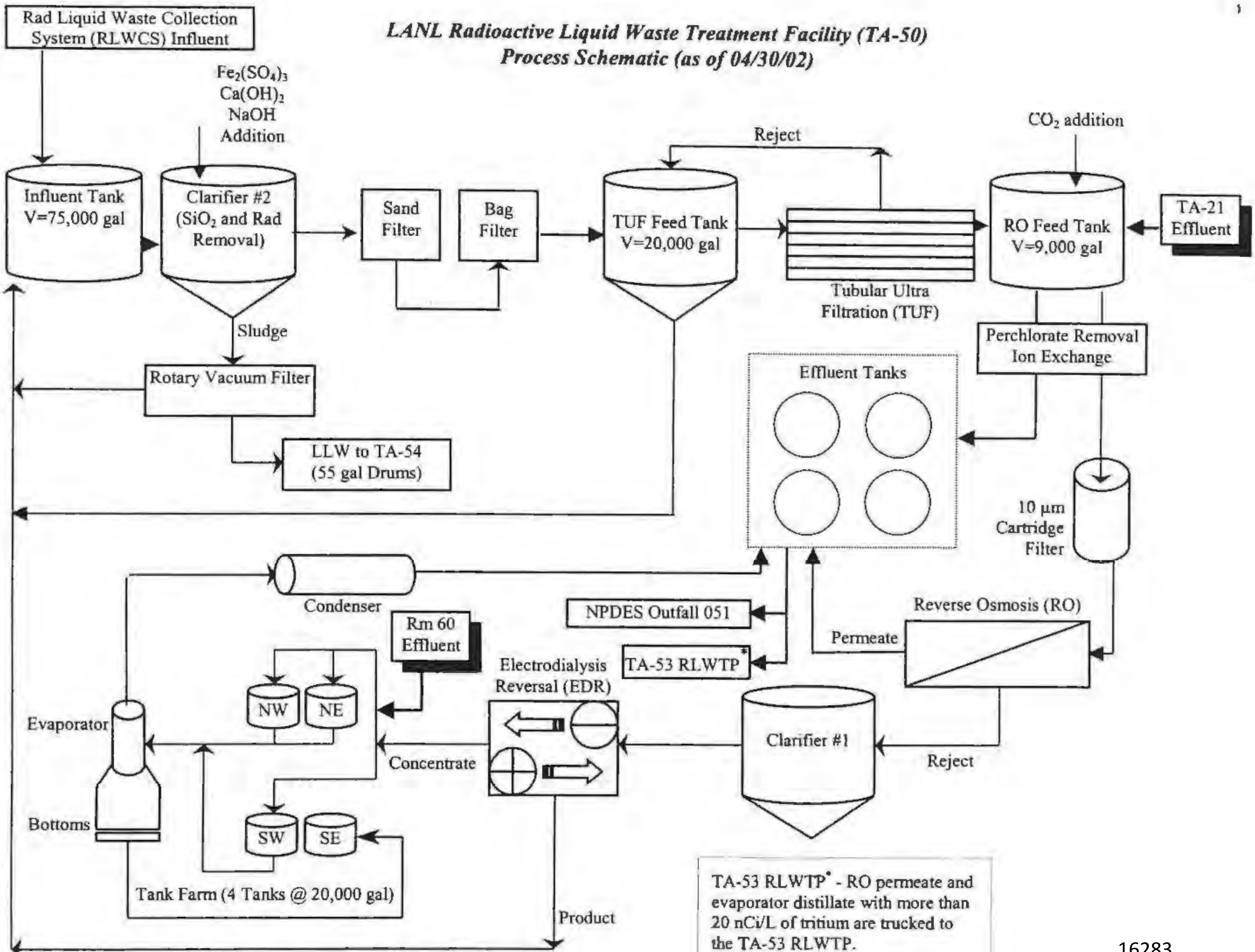
Steven Rae
Group Leader
Water Quality & Hydrology Group

SR:MS/am

Enclosures: a/s

Cy: W. Strickley, USEPA, Region VI, Dallas, Texas, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
M. Leavitt, NMED/GWPB, Santa Fe, New Mexico, w/o enc.
J. Vozella, DOE/OLASO, w/o enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
B. Stine, ADO, w/enc., MS A104
D. McLain, FWO-WFM, w/o enc., MS E518
R. Alexander, FWO-WFM, w/enc., MS E518
P. Worland, FWO-WFM, w/enc., MS E518
D. Moss, FWO-WFM, w/enc., MS E518
B. Ramsey, RRES-DO, w/o enc., MS J591
K. Hargis, RRES-DO, w/o enc., MS J591
D. Stavert, RRES-EP, w/o enc., MS J978
M. Saladen, RRES-WQH, w/enc., MS K497
B. Beers, RRES-WQH, w/o enc., MS K497
M. Bailey, RRES-WQH, w/o enc., MS K497
D. Woitte, LC, w/o enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

ENCLOSURE 1

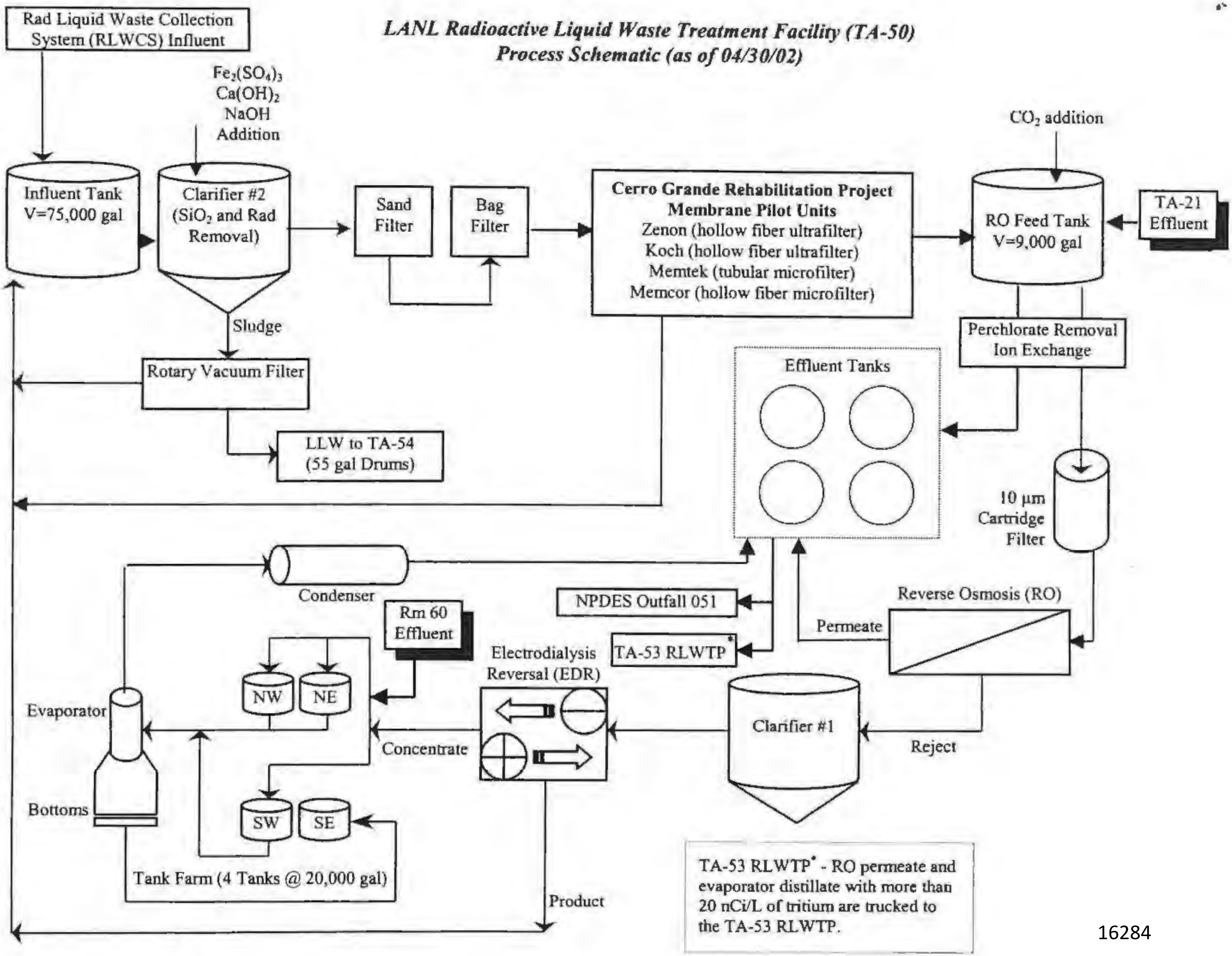


TA-53 RLWTP* - RO permeate and evaporator distillate with more than 20 nCi/L of tritium are trucked to the TA-53 RLWTP.

16283

ENCLOSURE 2

LANL Radioactive Liquid Waste Treatment Facility (TA-50) Process Schematic (as of 04/30/02)



16284

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 665-1859/Fax: (505) 665-9344

Date: November 27, 2002
Refer to: RRES-WQH: 02-438

EXHIBIT
J

Mr. Samual Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGES AT TA-50 RLWTF, NPDES PERMIT NO. NM0028355

Dear Mr. Coleman:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or the quantity of pollutants discharged. In accordance with Part III.D.1.a. *Reporting Requirements* of the Laboratory's NPDES Permit, the Laboratory is notifying EPA regarding the proposed installation of the influent tank farm and reverse osmosis (RO) pilot units at Technical Area 50, Radioactive Liquid Waste Treatment Facility (TA-50 RLWTF). These modifications to the TA-50 RLWTF will significantly increase storage capacity and should improve future water quality at NPDES Outfall 051. The following changes are shown on the enclosed schematic diagram:

1) Proposed Influent Tanks and Pump House (dashed lines) are estimated to be installed and operational in September, 2004; and,

2) Brackish Water (BW) RO unit and Sea Water (SW) RO unit with associated Ultra Filter (dashed lines) are currently being installed for a pilot study at the facility.

Please note that a Memcor Microfilter and Centrifugal Ultra Filtration (CUF) have previously been installed in order to improve operation and facilitate removal of reject and solids from the treatment process.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group at (505) 665-6085 if additional information would be helpful.

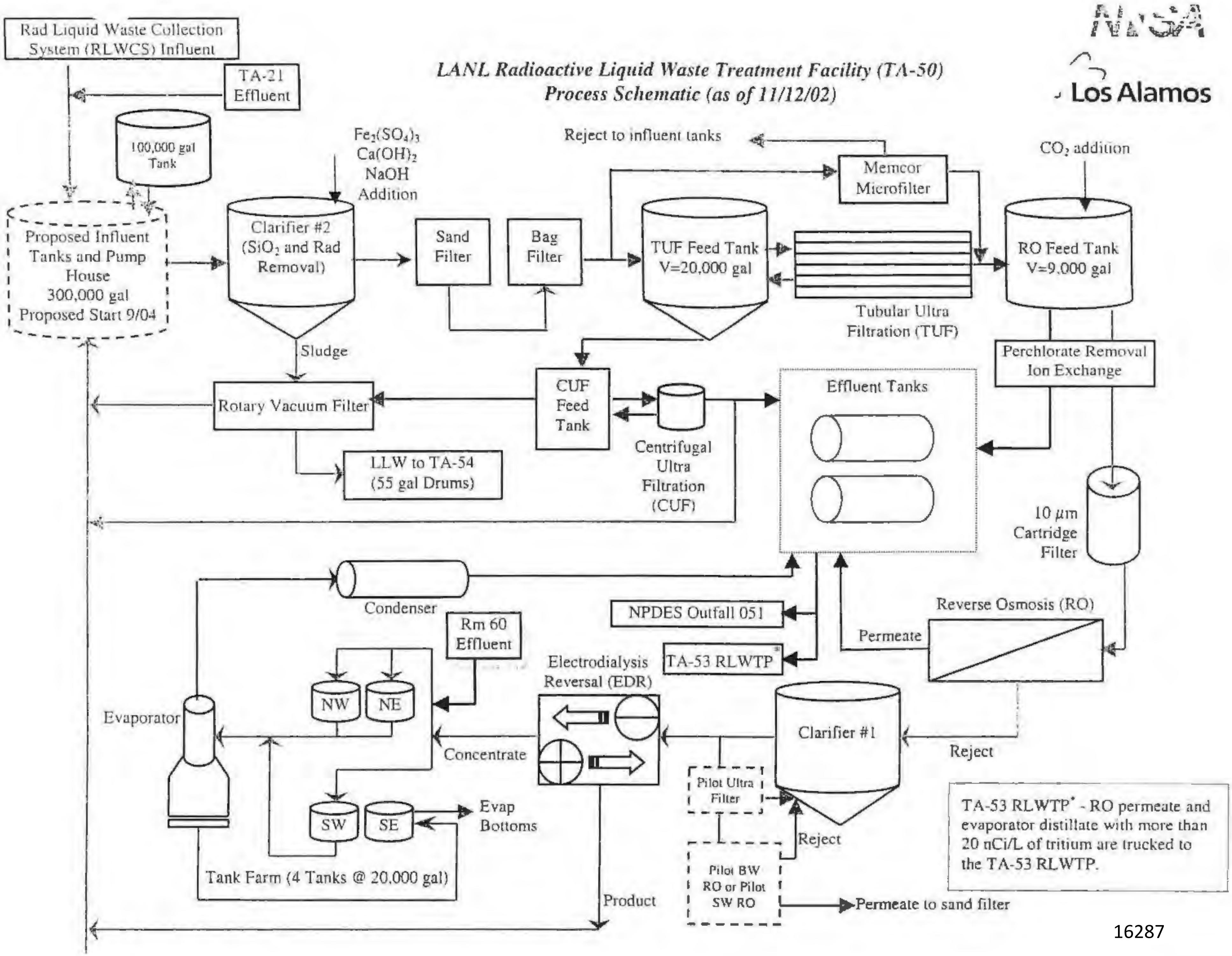
Sincerely,

Steven Rae
Water Quality & Hydrology Group

SR:MS/tml

Enclosures: a/s

Cy: W. Strickley, USEPA, Region VI, Dallas, Texas, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
M. Leavitt, NMED/GWPB, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
A. Stanford, FWO-DO, w/enc., MS K492
D. McLain, FWO-WFM, w/enc., MS E518
R. Alexander, FWO-WFM, w/enc., MS E518
P. Worland, FWO-WFM, w/enc., MS E518
D. Moss, FWO-WFM, w/enc., MS E518
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J591
M. Saladen, RRES-WQH, w/enc., MS K497
B. Beers, RRES-WQH, w/enc., MS K497
M. Bailey, RRES-WQH, w/enc., MS K497
D. Woitte, LC-ESH, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150



LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (as of 11/12/02)
NNSA
Los Alamos
Rad Liquid Waste Collection System (RLWCS) Influent
TA-21 Effluent
100,000 gal Tank
Proposed Influent Tanks and Pump House 300,000 gal Proposed Start 9/04
$Fe_2(SO_4)_3$ $Ca(OH)_2$ NaOH Addition
Clarifier #2 (SiO_2 and Rad Removal)
Sand Filter
Bag Filter
Reject to influent tanks
Memcor Microfilter
TUF Feed Tank V=20,000 gal
Tubular Ultra Filtration (TUF)
CO_2 addition
RO Feed Tank V=9,000 gal
Perchlorate Removal Ion Exchange
Sludge
Rotary Vacuum Filter
LLW to TA-54 (55 gal Drums)
CUF Feed Tank
Centrifugal Ultra Filtration (CUF)
Effluent Tanks
10 µm Cartridge Filter
Condenser
NPDES Outfall 051
TA-53 RLWTP*
Reverse Osmosis (RO)
Permeate
Rm 60 Effluent
Electrodialysis Reversal (EDR)
Evaporator
NW
NE
Concentrate
SW
SE
Evap Bottoms
Tank Farm (4 Tanks @ 20,000 gal)
Clarifier #1
Reject
Pilot Ultra Filter
Reject
Pilot BW RO or Pilot SW RO
Permeate to sand filter
Product
TA-53 RLWTP* - RO permeate and evaporator distillate with more than 20 nCi/L of tritium are trucked to the TA-53 RLWTP.

16287

(~~[illegible]~~)

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 665-1859 / Fax: (505) 665-9344

EXHIBIT
K

Date: April 18, 2003
Refer to: RRES-WQH: 03-082

Ms. Waudelle Strickley
Environmental Specialist
U. S. Environmental Protection Agency
Water Enforcement Branch
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALLS 051 AND 055, NPDES PERMIT NO. NM0028355

Dear Ms. Strickley:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or the quality of pollutants discharged. In accordance with Part III.D.1.a. *Reporting Requirements* of the Laboratory's NPDES Permit, we are providing written notification regarding the transfer of approximately 10,000 gallons of wastewater that will be treated at the TA-16 High Explosives Wastewater Treatment Facility (HEWTF) to the TA-50 Radioactive Liquid Wastewater Treatment Facility (RLWTF) to remove perchlorate.

The HEWTF waste stream will be sampled and characterized to demonstrate it meets the RLWTF's Waste Acceptance Criteria (WAC). The estimated disposal volume is based on five batch discharges of approximately 2,000 gallons of wastewater transported from the HEWTF to RLWTF, over the next three months. The treated wastewater from the HEWTF will be further treated at the RLWTF prior to discharge through NPDES Outfall 051. The RLWTF can adequately treat this perchlorate waste stream by ion exchange to less than 1 part per billion (ppb). The Laboratory's NPDES Permit does not have an effluent limit for perchlorate; however, it does require monitoring and reporting of perchlorate results in the Laboratory's Discharge Monitoring Reports (DMRs) for NPDES Outfall 051.

Installation of an ion exchange system at the HEWTF to remove perchlorate is being planned and should be completed by July, 2003. The HEWTF will then be able to treat and remove both high explosives and perchlorate from the influent waste streams. The transfer of perchlorate-contaminated effluent from the HEWTF to the RLWTF will continue until this installation is completed.

Please contact Mike Saladen of the Laboratory's Water Quality and Hydrology Group (RRES-WQH) at (505) 665-6085, if additional information would be helpful.

Sincerely,

Steven Rae
Group Leader
Water Quality & Hydrology Group

SR:MS/yg

Cy: Samual Coleman, USEPA, Region VI, Dallas, Texas
James Davis, NMED/SWQB, Santa Fe, New Mexico
Joseph Vozella, DOE/OLASO, MS A316
Gene Turner, DOE/OLASO, MS A316
James Holt, ADO, MS A104
Tony Stanford, FWO-DO, MS K492
Dennis McClain, FWO-WFM, MS J593
Rick Alexander, FWO-WFM, MS E518
Earle Marie Hanson, ESA-DO, MS P945
Dan MacDonell, ESA-OPS, MS C928
Ann Sherrard, ESA-OPS, MS C924
Mary Hockaday, DX-DO, MS P918
Eric McNamara, DX-4, MS C925
Gordon Jio, DX-2, MS C920
Beverly Ramsey, RRES-DO, MS J591
Kenneth Hargis, RRES-DO, MS J591
Doug Stavert, RRES-EP, MS J591
Mike Saladen, RRES-WQH, MS K497
Marc Bailey, RRES-WQH, MS K497
Deborah Woitte, LC-ESH, MS A187
RRES-WQH File, MS K497
IM-5, MS A150

Kick 2007 Reports

EXHIBIT
L

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Water Quality & RCRA (ENV-RCRA)
P.O. Box 1663, Mail Stop K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

Date: May 14, 2007
Refer To: ENV-RCRA: 07-097
LA-UR: 07-3266

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: NOTICE OF CHANGED CONDITION AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Ms. Hall:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any planned physical alterations or additions to a NPDES permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. The Laboratory's Radioactive Waste Treatment Facility (RLWTF) is planning to construct three new concrete evaporation tanks at Technical Area 52 to receive fully treated radioactive liquid effluent from RLWTF. These tanks are being constructed to reduce the volume of treated effluent being discharged through NPDES Outfall 051. Each tank will cover approximately one surface acre. The transfer line from the RLWTF to the tanks will be approximately 0.75 mile long. A copy of the proposed site location is enclosed for your review (Enclosure 1). Final drawings and specifications will be provided when completed.

Since the new evaporation tanks will be part of an existing wastewater treatment facility (i.e., RLWTF) which discharges under an NPDES permit, they will be exempt from RCRA permitting requirements pursuant to 40 CFR 264.1(g)(6) ("The requirements of this part do not apply to . . .(6) The owner or operator of . . . a wastewater treatment unit . . . ").

We intend to submit a detailed letter to the New Mexico Environment Department in the near future regarding these issues. We will provide your office with a copy of this correspondence.

Please contact Marc Bailey of the Laboratory's Water Quality and RCRA Group (ENV-RCRA) at (505) 665-8135, if you have any questions.

Sincerely,

A. R. Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA (ENV-RCRA) Group

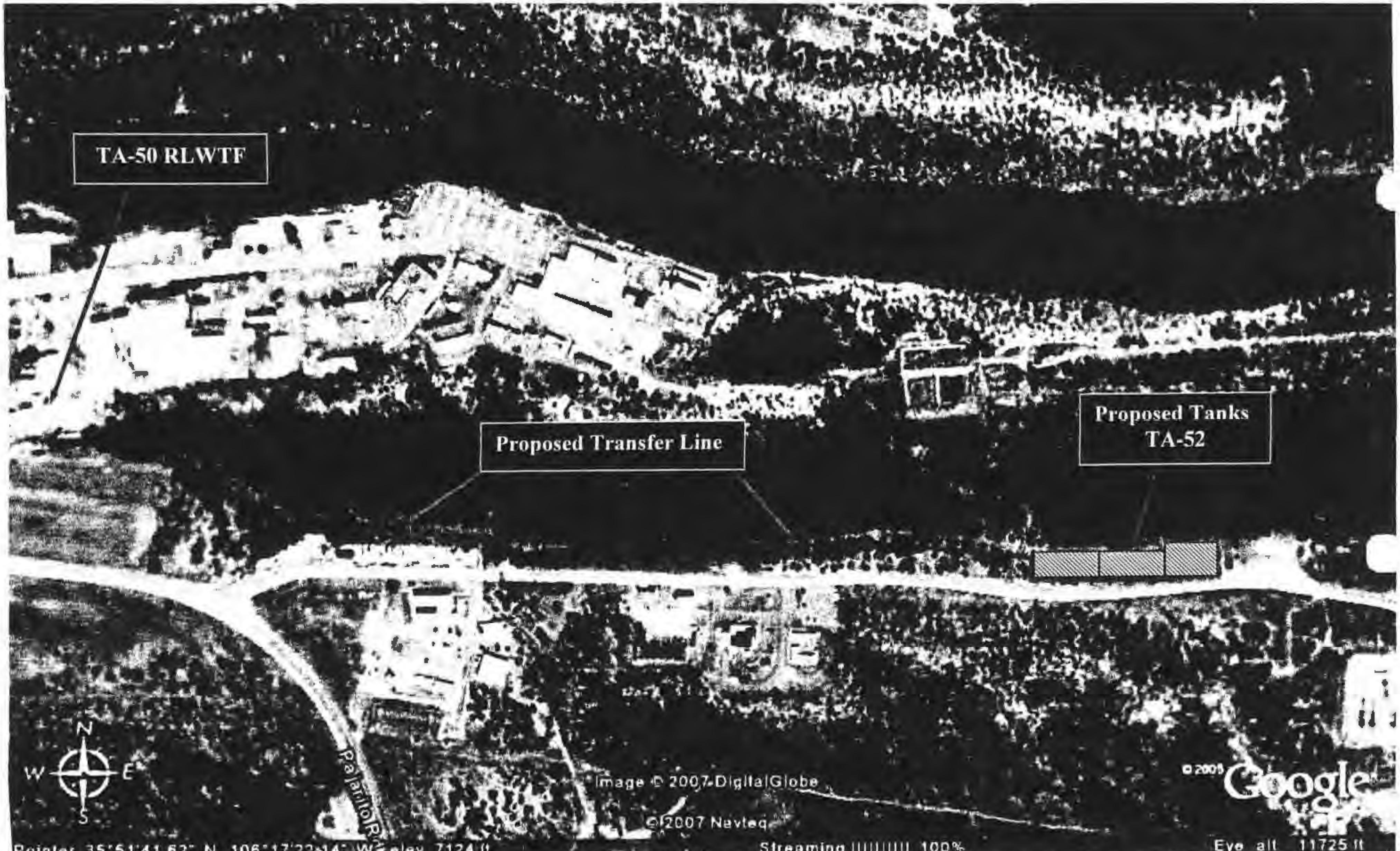
ARG:MB/lm

Enclosures: a/s

Cy: Isaac Chen, USEPA, Region VI, Dallas, TX, w/enc.
Marcy Leavitt, NMED/SWQB, Santa Fe, NM, w/enc.
Robert George, NMED/GWQB, Santa Fe, NM, w/enc.
James Bearzi, NMED HWB, Santa Fe, NM, w/enc.
Gene Turner, NNSA/LASO, w/o enc., MS A316
Richard V. Bynum, PADOPS, w/o enc., MS A102
Richard S. Watkins, ADESHQ, w/o enc., MS K491
Victoria George, ENV-DO, w/o enc. MS J978
Tina Sandoval, ENV-RCRA, w/o enc., MS K490
Mike Saladen, ENV-RCRA, w/o enc., MS K490
Bob Beers, ENV-RCRA, w/enc., MS K490
Marc Bailey, ENV-RCRA, w/enc., MS K490
Pete Worland, EWMO-RLW, w/enc., MS E518
Dave Moss, RLW, w/enc., MS E518
Phil Wardwell, LC-LESH, w/o enc., MS A187
ENV-RCRA, File, w/enc., MS K490
IRM-RMMSO, w/enc., MS A150

ENCLC JRE 1

NPDES PERMIT NO. NM0028355
Proposed RLWTF Concrete Evaporation Tanks



EXHIBIT

tabbles

M

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
P.O. Box 1663, Mail Stop J978
Los Alamos, New Mexico 87545
(505) 667-2211/FAX: (505) 665-8858

Date: May 6, 2008
Refer To: ENV-DO-08-009

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Ms. Hall:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. In accordance with Part III.D.1.a. *Reporting Requirements* of the Laboratory's NPDES Permit, we are providing written notification that the Radioactive Liquid Waste Treatment Facility (RLWTF) will be modifying its treatment process by installing pilot-scale ion exchange equipment to polish waters that have been processed through all existing treatment steps. The additional treatment is a scale-up of tests conducted in the summer of 2007 to use effluent polishing as a means of addressing contaminants. Equipment will likely be operated with different ion exchange resins to monitor treatment effectiveness.

The ion exchange step should not generate secondary liquid wastes, but will generate solid wastes in the form of spent resins. Spent resins will be characterized and disposed of properly.

Please contact Marc Bailey of the Laboratory's Water Quality and RCRA Group (ENV-RCRA) at (505) 665-8135, if you have any questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA (ENV-RCRA) Group

Cy:

Isaac Chen, USEPA, Region VI, Dallas, TX
Marcy Leavitt, NMED/SWQB, Santa Fe, NM
Robert George, NMED/GWQB, Santa Fe, NM
Gene Turner, DOE/LASO, MS A316
Richard S. Watkins, ADESHQ, MS K491
Victoria George, ENV-DO, MS J978
Pete Worland, EWMO-RLW, MS E518
Steve Hanson, EWMO-RLW, MS E518
Chris Del Signore, EWMO-RLW, MS E518
Mike Saladen, ENV-RCRA, MS K490
Bob Beers, ENV-RCRA, MS K490
Marc Bailey, ENV-RCRA, MS K490
Bob Lechel, ENV-EAQ, MS J593
Phil Wardwell, LC-ESH, MS A187
ENV-DO File, MS J978
ENV-RCRA File, MS K490
IRM-RMMSO, MS A150

EXHIBIT

N

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5105/FAX (505) 667-5948

Date: June 3, 2010
Refer To: ENV-RCRA-10-104
LAUR: 10-03618

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear: Ms. Hall:

SUBJECT: **LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051**

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements).* On August 1, 2010, new copper (Cu) limits of 0.14 μg/L and new zinc (Zn) limits of 2.2 μg/L will be effective. Typical copper and zinc concentrations in the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) effluent range from 20-60 μg/L Cu and 5-15 μg/L Zn. The following activities have been completed or are on-going to meet the new copper and zinc limits:

- The RLWTF is performing bench-scale column testing of ion exchange and adsorption media to remove copper and zinc from the RLWTF effluent waters. To date, nine different media have been tested at various flow rates, pH and oxidation conditions. Two of the nine media have reduced copper and zinc concentrations in the RLWTF effluent to below 1 μg/L. Only one media has been able to reduce the copper concentrations to below the 0.14 μg/L NPDES concentration as required on August 1, 2010. Long duration, bench-scale capacity/breakthrough studies are continuing. Study cost to date: $125K.
- A full-scale ion exchange system has been installed at the RLWTF to treat the effluent waters for removal of copper and zinc. The system will be approved for operation by June 11, 2010. System installation cost: $519K.

- Copper air lines are presently used for sparging air into the two RLWTF effluent tanks to enhance mixing of the RLWTF effluent. These copper air lines are being removed from the effluent tanks to remove any source of copper in the effluent. Activity cost: $15K.
- Two types of ion exchange media and vessels have been ordered from a vendor. Expected delivery of one media type is mid-June. The second media type delivery is expected in early July, 2010. Both media are not commercially available. LANS has a non-disclosure agreement with the vendor pertaining to the experimentation with and use of these media. Media cost: $56K.

In addition to these new ion exchange media, the RLWTF employs strategies to ensure that the effluent waters are in compliance with NPDES requirements. These strategies include Waste Acceptance Criteria (WAC) compliance, treatment of the wastewater through Best Available Technologies and, if needed, reprocessing of off-spec effluent waters. Effluent from the main treatment units is collected in batch mode in a tank. Prior to discharge of the effluent, a representative sample of the effluent is analyzed for indicator constituents to ensure compliance with the NPDES permit. If indicator constituent concentrations exceed permit limits, the water is reprocessed. Reprocessing options include: treatment through the polishing ion exchange (IX) units, retreatment through one or more of the main treatment units (e.g., Reverse Osmosis (RO), or RO and IX), retreatment through the entire main treatment process and/or combining treated water with other in-plant waters. The diagram that accompanies this notice, entitled "LANL Radioactive Liquid Waste Treatment Facility (TA-50) Process Schematic" shows primary RLWTF process flow paths (See Enclosure 1). Dashed outlines indicate a unit operation or tank that is presently not always used, or planned future installation as in the case of the pressure filter, but which could be brought into service, if needed.

The Minimum Quantification Level (MQL) in Part II of the NPDES Pemit No. NM0028355 for copper is 10 µg/L, and the MQL for zinc is 20µg/L. As specified in Section A. of PART II – OTHER CONDITIONS of the NPDES permit, a value of zero (0) may be used on the Discharge Monitoring Report (DMR) if the copper and zinc concentrations in the required monthly samples are less than the MQL.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality & RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GT:MS/lm

Enclosure: a/s

Cy: Willie Lane, USEPA Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
Steve Yanicak, LASO-GOV, w/enc., M894
George Rael, LASO-EPO, w/enc., A316
Michael B. Mallory, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Robert Mason, TA55-DO, w/enc., E583
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Steve Hanson, TA-55-RLW, w/enc., E518
Chris Del Signore, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/o enc., K490
Marc Bailey, ENV-RCRA, w/enc., K490
Bob Beers, ENV-RCRA, w/enc., K490
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

EXHIBIT

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Los Alamos
NATIONAL LABORATORY
EST.1943

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-4218/FAX: (505) 665-3811

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5105/FAX (505) 667-5948

Date: August 19, 2010
Refer To: ENV-RCRA-10-162
LAUR: 10-05550

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6WQ-N)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Hall:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*). The following changes are being made at the TA-50 Radioactive Liquid Waste Treatment Facility to reduce and/or eliminate the volume of treated effluent being discharged to Outfall 051 due to the new stringent copper and zinc limits that became effective August 1, 2010:

Short-term

A double-contained pipe will be installed from the effluent "Frac" tanks to allow for flows to both the existing cooling towers (Code 1-E) associated with the evaporator (Code 1-E) and for reprocessing. The blowdown from the cooling tower and over flow lines from the cooling towers will be routed for reprocessing.

Long-term

Alternatives are currently being evaluated to procure a trailer mounted evaporation system for effluent water entering the system that has sufficient capacity to ensure evaporation is greater than current effluent production and to account for cooling loss during winter months. Both the short-term and long-term changes are documented in the revised schematic for RLWTF (see Enclosure 1).

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GT:MB/lm

Enclosure: a/s

Cy: Brent Larson, USEPA/Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
Steve Yanicak, LASO-GOV, w/enc., M894
George Rael, LASO-EO, w/enc., A316
Michael B. Mallory, PADOPS, w/enc., A102
Robert McQuinn, ADNHHO, w/enc., K778
Carl Beard, ADSMS, w/enc., E585
Michael B. Mallory, PADOPS, w/o enc., AI02
J. Chris Cantwell, ADESHQ, w/o enc., K491
Robert Mason, TA55-DO, w/enc., E583
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Steve Hanson, TA-55-RLW, w/enc., E518
Chris Del Signore, TA-55-RLW, w/enc., E518
Denny L. Hjeresen, ENV-DO, w/enc., (E-File)
Mike Saladen, ENV-RCRA, w/o enc., (E-File)
Marc Bailey, ENV-RCRA, w/enc., (E-File)
Bob Beers, ENV-RCRA, w/enc., (E-File)
Cindy Blackwell, LC-LESH, w/enc., A187
Deborah Woitte, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

LANL Radioactive Liquid Waste Treatment Facility (TA-50) Process Schematic (as of 08/18/2010)

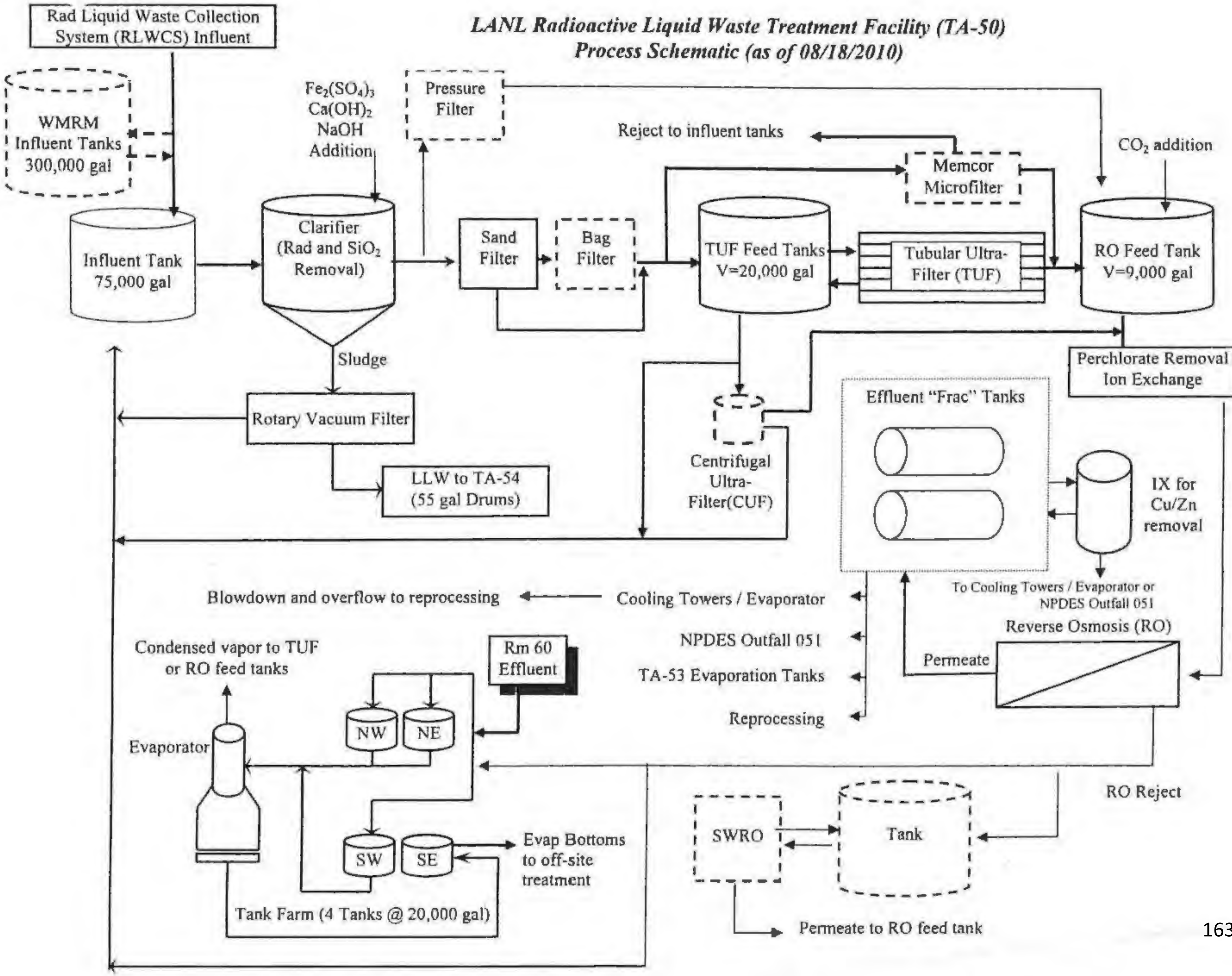


EXHIBIT
P

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: September 16, 2010
Refer To: ENV-RCRA-10-175
LAUR: 10-06070

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear: Ms. Hall:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The Radioactive Liquid Waste Treatment Facility (RLWTF) has recently made a number of operational treatment changes to reduce concentrations of copper and zinc being discharged to Outfall 051 due to the new stringent effluent limits, effective August 1, 2010. The newly installed ion exchange media to remove copper and zinc to the new effluent limits appear to be effective. However, when the ion exchange media effluent waters are placed in the existing RLWTF effluent tanks (referred to as the N. and S. Frac tanks), the water is then found to be greater than the discharge limits. NNSA/LANS will install a new 1,000 gallon polymeric tank in Room 38 of the RLWTF to receive the ion exchange media effluent water. This new tank will be referred to as Tank 38. This new tank should eliminate any residual copper and zinc contamination that is suspected to be in the N. and S. Frac tanks. New hoses will be installed in Rooms 34B, 36 and 38 at the RLWTF to move water from the ion exchange vessels in Room 34B to Tank 38. New hoses, also, will be installed to transfer the Tank 38 water back to either Frac tank in Room 34B for reprocessing and for connecting Tank 38 to the line used to discharge effluent to Outfall 051. To determine if Tank 38 contents meet discharge requirements, a representative sample of the Tank 38 contents will be collected. The representative sample will be obtained from the re-circulation line after the 1,000 gallon contents of Tank 38 have been re-circulated for 80 minutes at a rate of 50 gpm. If discharge to the outfall is from Tank 38, a new NPDES compliance sampling location is proposed. This location will be in Room 38, on the discharge side of the pump that will pump the Tank 38 contents to the outfall. Enclosure 1 shows an isometric drawing of Tank 38, associated piping, recirculation/discharge pump, proposed NPDES sampling location and flow paths during discharge to Outfall 051. If discharges to Outfall 051 are made from the Frac tanks, the presently approved NPDES compliance sampling location in Room 116 at the RLWTF will continue to be used.

Additionally, RLWTF effluent waters that are not within discharge limits to the outfall may need to be stored in the TA-50-250 Waste Management Risk Mitigation (WMRM) facility. New hoses will be installed to move water from the Frac tanks in Room 34B to tank #6 in the WMRM facility. A copy of the revised treatment schematic is enclosed (see Enclosure 2).

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions or need additional information.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

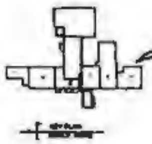
ARG:GT:MS/lm

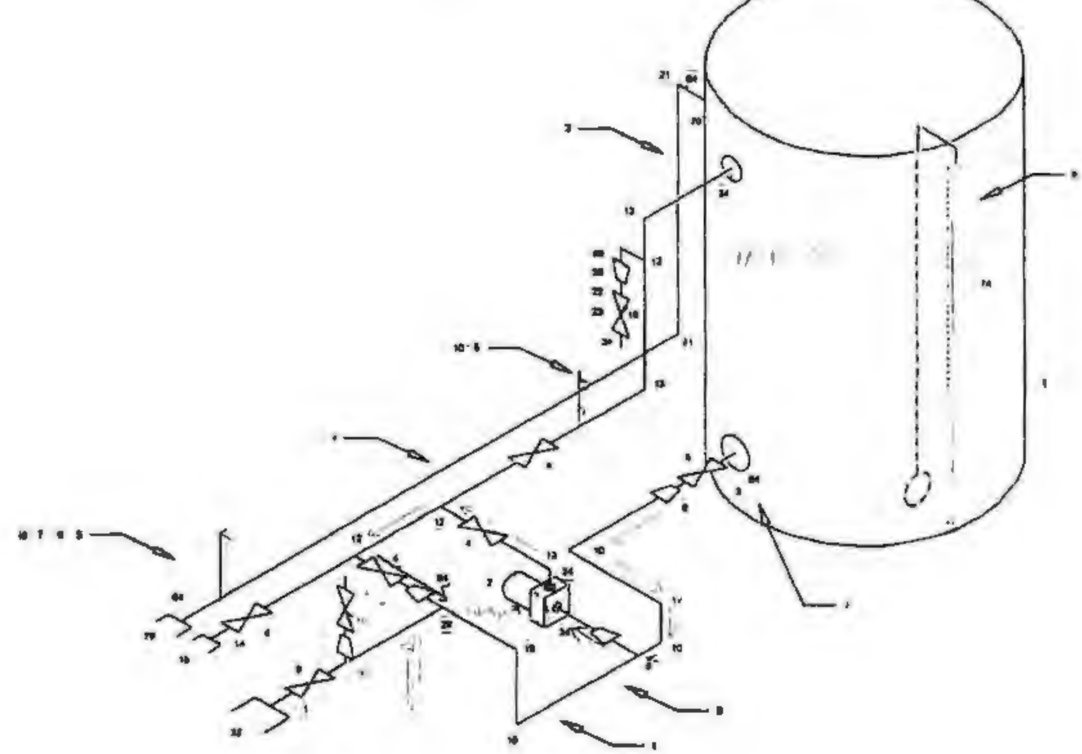
Enclosures: a/s

Cy: Brent Larsen, USEPA/Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Michael B. Mallory, PADOPS, w/o enc., AI02
Robert L. McQuinn, ADHHO, w/o enc., K778
Carl A. Beard, ADSMS, w/o enc., E585
J. Chris Cantwell, ADESHQ, w/o enc., K491
Dennis Hjeresen, ENV-DO, w/o enc., (E-File)
Robert Mason, TA55-DO, w/enc., E583
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518

ENCLOSURE 1

16304





1000 GAL. TANK PARTIAL PIPING - ISOMETRIC

SCALE NONE

GENERAL NOTES

1. SCALE – NONE.
2. "OR APPROVED EQUAL" IS ALWAYS IMPLIED AFTER A BRAND NAME, PATENTED PROCESS OR CATALOG NUMBER. THE CONTRACTOR MAY SUBSTITUTE ANY BRAND OR PROCESS APPROVED AN EQUAL BY SPECIFYING ARCHITECT/ ENGINEER. THE ONLY EXCEPTION IS WHERE "NO SUBSTITUTION" IS SPECIFIED.
3. REFER TO BILL OF MATERIALS (BOM) IN REFERENCED DCF FOR MATERIAL CALLOUTS AND INSPECTION REQUIREMENTS
4. ALL ITEMS ML-4
5. ALL INSTALLATION SHALL CONFORM WITH TO LANL STANDARDS
6. FIELD ADJUST PIPE DIMENSIONS

KEYED NOTES

1. DISCHARGE HOSE & ASSOCIATED PIPING - 4" MINIMUM
2. TANK CONNECTION - 2" NPTF (DISCHARGE)
3. TANK CONNECTION - 1-½" NPTF (INLET)
4. EXTEND 2" LINE TO PIPE SUPPORT AND CONNECT HOSE TO DRAIN IN ROOM 36 IF EXISTING DRAIN IN ROOM 38 IS PERMANENTLY BLOCKED. INSTALL THROUGHWALL FITTING AS HIGH AS POSSIBLE
5. INSTALL PIPE SECTIONS AT LEAST 3' APART
6. PIPING WEIGHS LESS THAN 5 LBS/FT. ANCHORING NON STRUCTURAL, NO SSI REQUIRED
7. ATTEMPT TO EQUATE OUTLET LINE HEIGHT TO THE SAME HEIGHT AS THE TANK DISCHARGE (UNION STRUT FOOTING MIGHT NOT BE REQUIRED) OR CONSIDER ADDING A PIECE OF UNISTRUT UNDERNEATH PIPE SUPPORT)
8. ANCHOR PUMP TO THE FLOOR OR CONSIDER USING UNISTRUT, ¼" STEEL PLATE AND ½" HILTI ANCHORS IN ADDITION TO THE PUMP FOOT AND ANCHOR TO THE FLOOR
9. INSTALL LEVEL, FLOATS & SCALE PER MANUFACTURER INSTRUCTIONS
10. BOM ITEMS 53 TO 59

Rev	Date	Class Rev	ADC	Description	DFT	CSE SME	CHK	SUB	APP
3									
2									
1									

ENGINEERING STANDARDS PROGRAM

Radioactive Liquid Waste Treatment Facility (RLWTF)

PARTIAL PIPING ISOMETRIC

BLDG-0001 ROOM-38 TA-50

J.C.

J.C.

C.

Date

Los Alamos National Laboratory
Los Alamos, NM 87545

F-9000

1 OF 3

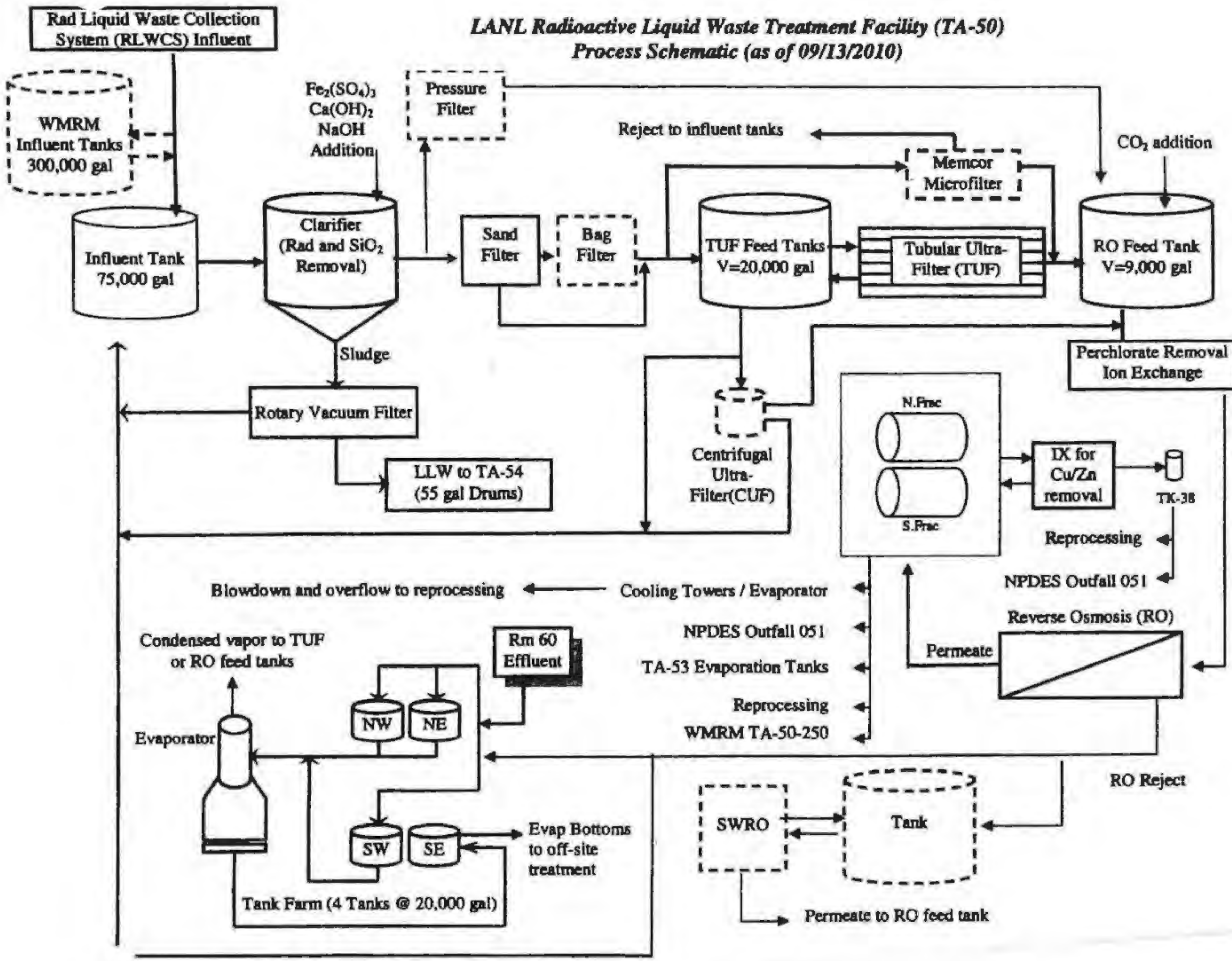
UNCLASSIFIED

N/A

0

ENCLOSURE 2

LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (as of 09/13/2010)



Los Alamos
NATIONAL LABORATORY
EST. 1943

EXHIBIT
Q

NM0028355 permit modification

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-4218/FAX: (505) 665-3811

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: December 9, 2010
Refer To: ENV-RCRA-10-239
LAUR: 10-08215

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6 EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear: Ms. Hall:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The Radioactive Liquid Waste Treatment Facility (RLWTF) plans to add hardness to the facility effluent waters. Hardness will be added by the addition of soluble calcium and/or magnesium salts to the RLWTF process water or effluent water. The purpose of adding hardness to the water is to reduce the toxicity of copper and zinc to the *Daphnia Pulex* organism. These metals have been shown to be major contributors to the failed Whole Effluent Toxicity (WET) tests at Outfall 051.

The RLWTF treatment processes reduce the hardness of the effluent water to essentially zero hardness by the use of the clarifier (which operates as a softener) and the reverse osmosis treatment operation. This reduction of hardness exacerbates the toxicity of the copper and zinc to the *Daphnia Pulex* organism.

The hardness salts will be added either to the North or South Frac Tanks or to Tank 38. The hardness of the RLWTF effluent water will be adjusted to approximately 75 mg/L as $CaCO_3$ using the calcium and/or magnesium salts.

A copy of the revised treatment schematic is enclosed (see Enclosure 1).

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions or need additional information.

Sincerely,

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

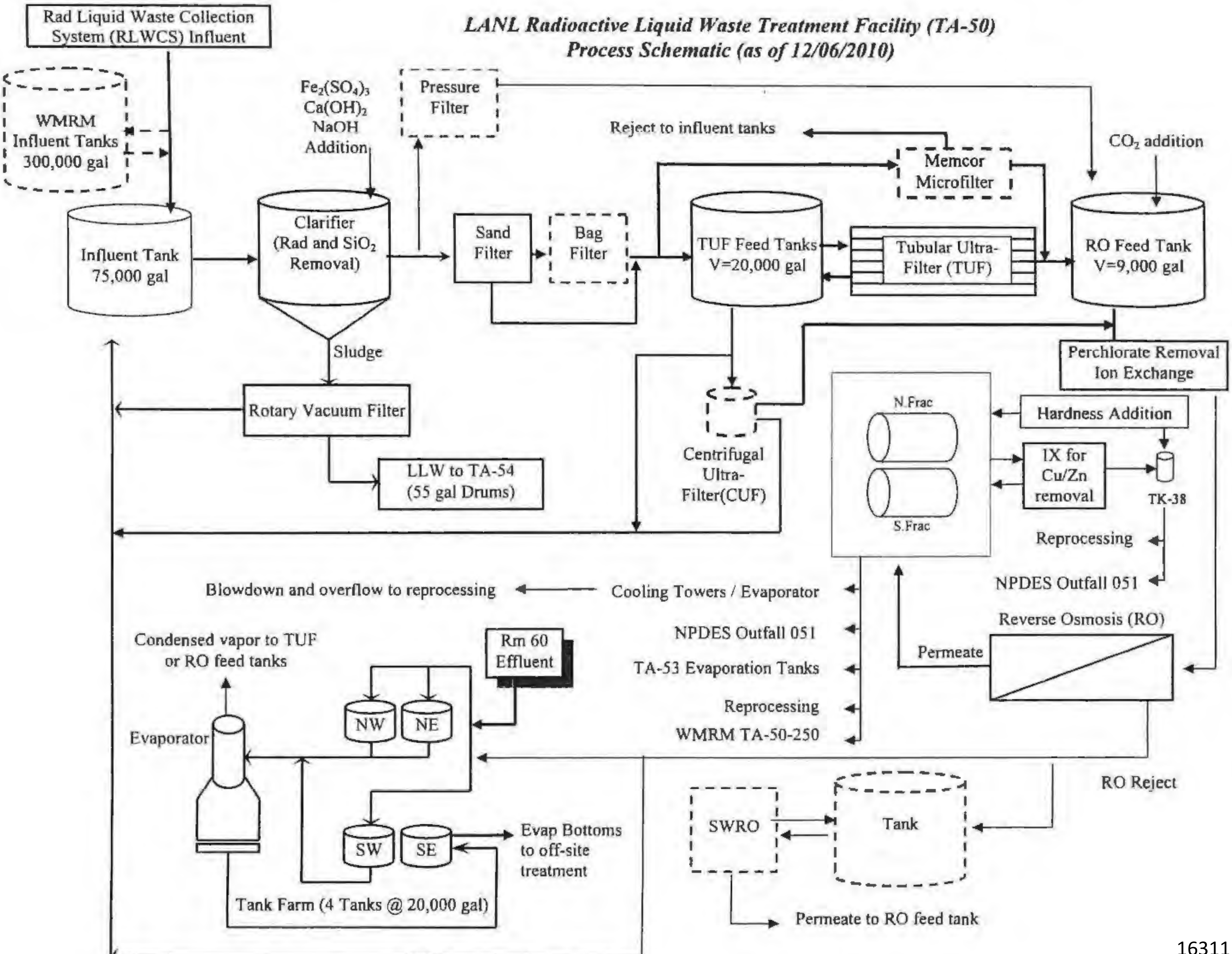
ARG:GT:MB/lm

Enclosure: a/s

Cy: Brent Larsen, USEPA Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Michael B. Mallory, PADOPS, w/o enc., AI02
Robert L. McQuinn, ADHHO, w/o enc., K778
Carl A. Beard, ADSMS, w/o enc., E585
J. Chris Cantwell, ADESHQ, w/o enc., K491
Dennis Hjeresen, ENV-DO, w/o enc., (E-File)
Robert Mason, TA55-DO, w/enc., E583
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., (E-File)
Marc Bailey, ENV-RCRA, w/enc., (E-File)
Bob Beers, ENV-RCRA, w/enc., (E-File)
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., AI50

ENCLOSURE 1

LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (as of 12/06/2010)



Los Alamos
NATIONAL LABORATORY
EST.1943

EXHIBIT
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NM0028
Permit
Modific

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: February 23, 2011
Refer To: ENV-RCRA-11-0027
LAUR: 11-00881

Ms. Mary Simmons
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6SF)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Ms. Simmons:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The Radioactive Liquid Waste Treatment Facility (RLWTF) is making modifications to the low-level wastewater treatment system. Modifications include installing pipes and components to bypass the existing RLWTF gravity sand filter and tubular ultra-filter and replace the bypassed treatment processes with a pressure media filtration and cartridge filtration capability. The installation of these new filtration capabilities will provide the RLWTF with reliable filtration downstream of the process clarifier and upstream of the reverse osmosis unit. Additionally, the seawater reverse osmosis unit (SWRO) and associated reject tank have been removed from the treatment system. A pilot study was conducted by RLWTF representatives to evaluate if the volume of the regular reverse osmosis (RO) concentrate stream could be reduced using a SWRO unit. The pilot study has been completed and the hoses to the SWRO have been disconnected. Enclosure 1 highlights the aforementioned treatment system modifications. Enclosure 2 represents the modified treatment schematic to be in operation in late July or early August 2011.

Additionally, in April 2011, the RLWTF will initiate the use of magnesium hydroxide instead of calcium hydroxide in the facility's treatment system clarifier. Magnesium hydroxide raises the pH in the clarifier and is the source of the hydroxide ion that precipitates with the ferric iron. RLWTF treatment operators would like to use magnesium hydroxide rather than calcium hydroxide because it has been proven to be more effective in silica removal in the clarifier, which then reduces silica fouling of the reverse osmosis (RO) membranes and the Hydrochem waste evaporator heat exchanger plates. The Material Safety Data Sheet (MSDS) for magnesium hydroxide is enclosed for your review (See Enclosure 3).

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GT:MS/lm

Enclosure: a/s

Cy: Brent Larsen, USEPA/Region 6, Dallas, TX, w/enc.
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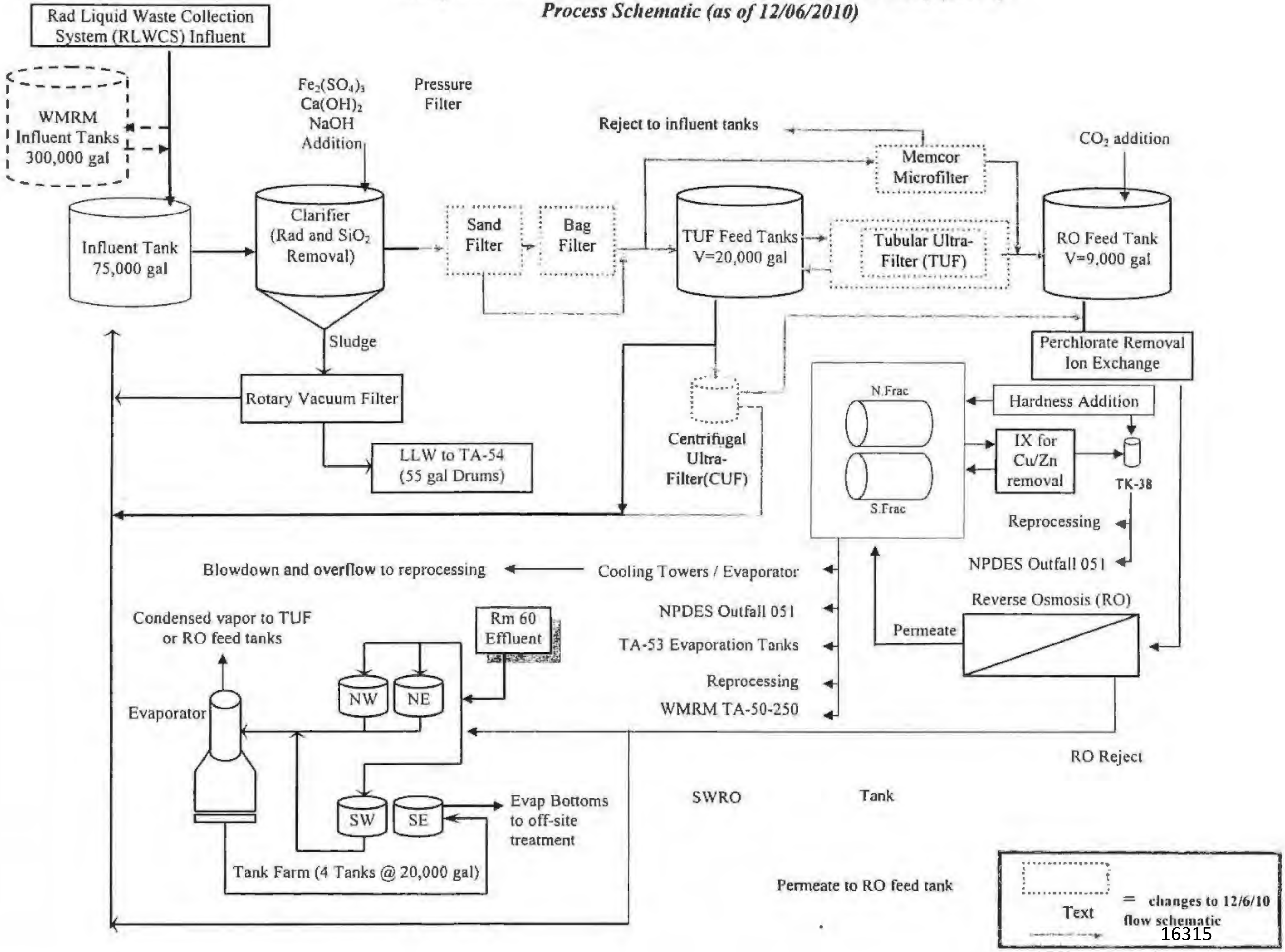
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., Al50

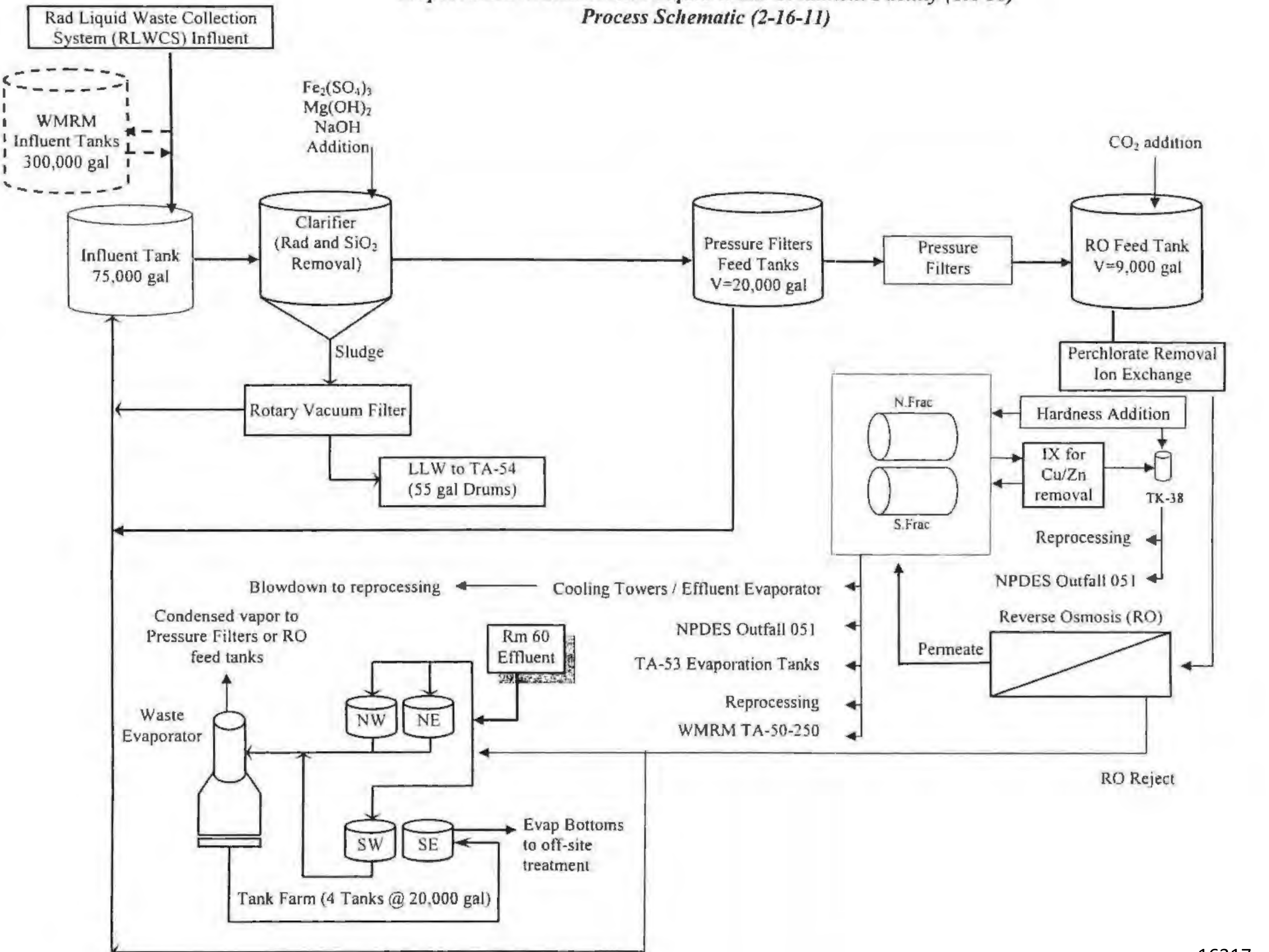
ENCLOSURE 1

Changes to LANL Radioactiv[illegible]d Waste Treatment Facility (TA-50)
Process Schematic (as of 12/06/2010)



ENCLOSURE 2

Proposed LANL Radioactive Liqu... Waste Treatment Facility (TA-50)
Process Schematic (2-16-11)



ENCLOSURE 3

Mag Hydroxide

UNIVAR®

Univar USA Inc Material Safety Data Sheet

MSDS No: P14725V

Version No: 010 2006-08-18

Order No:

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

The Version Date and Number for this MSDS is : 08/18/2006 - #010

****
SECTION I PRODUCT IDENTIFICATION
****

PRODUCT NAME: MAGNESIUM HYDROXIDE SOLUTION

MSDS #: P14725V

DATE ISSUED: 04/17/2000

SUPERSEDES: 08/08/1997

ISSUED BY: 008497

REVIEWED DATE: 07/16/2004

This MSDS has been reviewed on 07/16/2004, and is current as of the DATE ISSUED above.

SECTION I Chemical Product And Company Identification

Product Name: Magnesium Hydroxide Solution
Hi-Chem Mag-50

CAS NUMBER: 1309-42-8

Distributed by:
Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400

Section II Composition/Information On Ingredients

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Magnesium Hydroxide	1309-42-8	51-65	10 mg/m3 (total dust) 5 mg/m3 (respirable dust)	15 mg/m3 (total dust)	N/A

Section III Hazard Identification

ROUTES OF EXPOSURE: N/A

SUMMARY OF ACUTE HEALTH HAZARDS The product presents a very low health risk. Magnesium hydroxide is a general purpose food additive. Dust generated from the dried product is classified as a nuisance dust.

INGESTION: Ingestion is unlikely. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain and diarrhea.

INHALATION: May irritate the respiratory tract on prolonged or repeated contact. May aggravate preexisting respiratory conditions.

SKIN: Repeated or prolonged contact may cause irritation

EYES: May irritate or injure eyes.

SUMMARY OF CHRONIC HEALTH HAZARDS: The excessive inhalation above (TLV) of mineral dust, over long periods of time, may cause industrial bronchitis, reduce breathing capacity, and lead to increased susceptibility to other lung disease.

SIGNS AND SYMPTOMS OF EXPOSURE: N/A
EFFECTS OF OVEREXPOSURE: N/A

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Dust from the dried product may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.

NOTES TO PHYSICIANS: N/A

Section IV First Aid Measures

INGESTION: Low toxicity. Give 1-2 glasses of water and seek immediate medical attention. Never give anything of mouth to an unconscious person. Leave decision to induce vomiting for medical personnel, since some particles may be aspirated into the lungs.

INHALATION: Move to fresh air; if discomfort persists, get medical attention.

SKIN: Wash with soap and water

EYES: Irrigate immediately with plenty of water. Obtain medical attention if necessary.

Section V Fire Fighting Measures

FLASH POINT: N/A
AUTOIGNITION TEMPERATURE: N/A
LOWER EXPLOSIVE LIMIT: N/A
UPPER EXPLOSIVE LIMIT: N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A
EXTINGUISHING MEDIA: N/A
SPECIAL FIREFIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR NIOSH-APPROVED, POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING WHEN APPROPRIATE.

Section VI Accidental Release Measures

Dike the spilled liquid, and either pump back into original container or cover with clay-type substance for absorption.

Section VII Handling and Storage

Store at ambient temperature. Prevent possible eye and skin contact by wearing protective clothing and equipment.

Section VIII Exposure Controls/Personal Protection

RESPIRATORY PROTECTION: Respirator approved by NIOSH/MSHA are adequate for contaminate concentrations encountered.
VENTILATION: N/A
PROTECTIVE CLOTHING: Gloves are recommended, rubber gloves re recommended when repeated or prolonged contact is likely.

EYE PROTECTION: Safety glasses are recommended.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: N/A
WORK/HYGIENIC PRACTICES: Avoid contact with the eyes and skin.

Section IX Physical and Chemical Properties

PHYSICAL STATE:	Milky liquid
MELTING POINT/RANGE:	N/A
pH:	10-11
BOILING POINT/RANGE:	212 DEG F, 100 DEG C
APPEARANCE/COLOR ODOR:	White - Off white, No odor
SOLUBILITY IN WATER:	NIL
SPECIFIC GRAVITY (Water = 1):	1.4-1.5
VAPOR DENSITY (Air = 1):	N/A
VAPOR PRESSURE (mmHg):	N/A
MOLECULAR WEIGHT:	N/A
% OF SOLUTION:	48-51 51-55 61-65
% VOLATILES:	49-52 45-49 35-39

Section X Stability and Reactivity

STABILITY: Stable HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: N/A

MATERIALS TO AVOID: Acids and maleic anhydride Magnesium hydroxide is soluble in aqueous acids generating heat.

HAZARDOUS DECOMPOSITION PRODUCTS: HEAT AND STEAM

Section XI Toxicological Information

N/A

Section XII Ecological Information

N/A

Section XIII disposal Considerations

May be disposed of in a secured sanitary landfill. Disposal must be done in accordance with Local, State, and Federal regulations.

Section XIV Transport Information

DOT Proper Shipping Name: N/A
DOT Hazard Class/I.D. No: N/A

Section XV Regulatory Information

Reportable Quantity: N/A
NFPA Rating: Health - 1; Fire - 0; Reactivity - 0
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme
Carcinogenicity Lists: No NTP: No IARC Monograph: No OSHA Regulated: No

Section XVI Other information

SYNONYMS/ COMMON NAMES: Brucite
CHEMICAL FAMILY TYPE: Magnesium Hydroxide

Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

Notice

Univar USA Inc. ("Univar") expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

EXHIBIT

S

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: February 23, 2011
Refer To: ENV-RCRA-11-0034
LAUR: 11-10030

Mr. Isaac Chen
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Permits and Technical Assistance Section (6WQ-PP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Mr. Chen:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, SUPPLEMENTAL INFORMATION FOR NOTICE OF PLANNED CHANGE FOR THE ADDITION OF HARDNESS TO OUTFALL 051 EFFLUENT

Per your request, additional information is being provided regarding the Notice of Planned Change sent to the U. S. Environmental Protection Agency's Region 6 in December 2010 (reference ENV-RCRA-10-239) concerning plans to restore hardness to the Radioactive Liquid Waste Treatment Facility (RLWTF) effluent waters. The enclosed report is an evaluation of how hardness contributes to the whole effluent toxicity of Outfall 051 effluent. This report was prepared by Pacific EcoRisk in Fairfield, California (See Enclosure 1).

This information is provided as a follow-up to e-mail correspondence sent to you from Mike Saladen on December 23, 2010. Los Alamos National Security, Inc. (LANS) and National Nuclear Security Administration (NNSA) representatives will be scheduling a visit to your office in early March 2011 to continue this discussion.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions or need additional information.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MB/lm

Enclosure: a/s

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William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
Steve Yanicak, LASO-GOV, w/enc., M894
Michael Mallory, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
Randy Johnson, ENV-ES, w/enc., E500
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA, File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

An Evaluation of the Role of "Hardness" in the Amelioration and/or Exacerbation of Los Alamos National Laboratory Outfall 051 Effluent Toxicity

Prepared For:

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, NM 87545

Prepared By:

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

February 2011
Report Revised February 23, 2011

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

1. INTRODUCTION

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory (LANL) requires the permittee(s) to perform acute and/or chronic aquatic toxicity bioassays for several discharge outfalls throughout the Laboratory. Pacific EcoRisk, Inc. (PER) has been performing acute toxicity testing on LANL's Radioactive Liquid Waste Treatment Facility (RLWTF) Outfall 051 effluent using the freshwater crustacean *Daphnia pulex* since 2007. During this time sporadic occurrences of toxicity have been observed. Examination of the basic water quality characteristics of the 051 effluent suggests that the hardness of the effluent is playing a role in the observed toxicity.

1.1 Hardness in LANL Surface Water and Groundwater

Hardness is a natural component of water and is defined as the concentration of multivalent cations (mainly divalent cations). The primary hardness cations are generally calcium (Ca^{2+}) and magnesium (Mg^{2+}). The U.S. Geological Survey reports that some of the United States' hardest surface waters are found in New Mexico, Arizona, and Texas. Interestingly, while the Los Alamos region is surrounded by surface waters categorized as "very hard" (> 181 mg/L), it can be considered an "island" of surface water hardnesses typically in the "moderately hard"(60-120 mg/L) and "hard" (121-180 mg/L) range (http://water.usgs.gov/owq/hardness-alkalinity.html#map). This is consistent with the surface water hardnesses ranging from 52-159 mg/L that were measured for LANL ambient surface waters that were previously received and analyzed (Table 1) at the PER laboratory (PER 2005).

Table 1. Surface water quality characteristics of the Los Alamos ambient water samples.

Sample ID	Sample Date	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
CAMO-05-61170	7/26/05	10.8	7.72	10.7	119	111	357	<1.0
CAMO-05-61172	7/26/05	9.7	7.13	10.2	170	159	422	<1.0
CAMO-05-61174	7/26/05	7.9	7.24	11.3	138	117	423	<1.0
CAMO-05-61176	7/26/05	6.7	7.66	12.2	130	90	483	<1.0
CALA-05-61185	7/26/05	6.9	7.64	10.9	64	93	199	<1.0
CAMO-05-61166	8/18/05	6.0	7.05	10.2	90	99	244	<1.0
CAMO-05-61178	8/18/05	8.9	7.33	9.8	78	52	265	<1.0
CAMO-05-61180	8/18/05	8.9	7.80	11.1	92	82	271	<1.0

Data from PER 2005; water quality characteristics were measured at the time of sample log-in at the testing lab.

However, the source of water used at LANL is not surface water, but rather is domestic "tapwater" provided by Los Alamos County which pumps high-quality groundwater from the local aquifer via three water supply well fields (Otowi, Pajarito and Guaje), each of which has different hardness characteristics (Environmental Surveillance at Los Alamos during 2000, LA-13861-ENV):

- The Otowi field - The water hardness ranges from 63-89 mg/L (as $CaCO_3$);
  - o calcium concentrations range from 20-22 mg/L;
  - o magnesium concentrations range from 3-8 mg/L;
- The Pajarito field – The water hardness ranges from 42-96 mg/L;
  - o calcium concentrations range from 11-27 mg/L;
  - o magnesium concentrations range from 3-8 mg/L;
- The Guaje field - The water hardness ranges from 29 to 56 mg/L;
  - o calcium concentrations range from 11-17 mg/L;
  - o magnesium concentrations range from 1-3 mg/L.

Note – Due to the unique hydrogeology of the aquifer that serves Los Alamos, its water hardness is comprised almost completely by calcium and magnesium.

This "tapwater" is used in LANL's radiological and nuclear facilities in a variety of applications. Wastewater from these facilities is collected and routed via a collection system to the influent tank at the RLWTF for treatment. Wastewater fed from this influent tank to the RLWTF treatment process is termed "RAW" influent. The treated water discharged from the RLWTF treatment process is termed "FINAL" effluent. The "RAW" influent to the RLWTF starts out with a hardness of approximately 40-45 mg/L (Table 2). However, the RLWTF's various wastewater treatment processes have the indirect effect of reducing the hardness in the Outfall 051 "FINAL" effluent to approximately 1-3 mg/L (range = 0.2-12 mg/L in 2008-09).

Table 2. Hardness-related water quality characteristics in LANL "Tapwater", "RAW" RLWTF influent, and Outfall 051 "FINAL" effluent

Water Quality Parameter	1994-1997[a]	2008[b]		2009[b]	
	"Tapwater"	"RAW" Influent	"FINAL" Effluent	"RAW" Influent	"FINAL" Effluent
Hardness (mg/L as $CaCO_3$)	48.9	41.8	1.47	44.6	2.7
Calcium (mg/L)	13	11.4	0.31	12.0	0.40
Magnesium (mg/L)	4	3.2	0.17	3.6	0.41

a - A Mathematical Model (AMIGA) of Solution Chemistry and Silica Solubility in High Silica Water at LANL, V. P. Worland, May 1997.

b - Data from 2008 and 2009 Annual Reports for the LANL Rad Liquid Waste Treatment Facility.

1.2 Importance of Hardness Ca^{2+} and Mg^{2+} Ions in Biological Systems

While the RLWTF's wastewater treatment processes effectively reduce the concentrations of many effluent contaminants (e.g., metals, etc.), the concomitant reduction of Ca^{2+} and Mg^{2+} concentrations could be problematic in that all organisms (i.e., plants, invertebrates, and vertebrates) require Ca^{2+} and Mg^{2+} in order to exist. These two elements are considered "the most important and abundant dissolved solids in freshwater" (Rand et al., 1995). There are numerous critical biological processes that are dependent on Ca^{2+} in order to function. It is essential for metabolic processes in all living organisms (Goldman and Horne 1983), a regulator of cell permeability (Ricklefs 1979), the main skeletal component of many animals and some plants (Goldman and Horne 1983). Ca^{2+} release is the trigger for many cellular events including muscle contraction (Lehninger et al., 1993). Mg^{2+}, which has a similar water chemistry to Ca^{2+}, is vital for energy transfer in every cell since it catalyzes the change from ATP to ADP (Goldman and Horne 1983). Plants also require Mg^{2+} to form the active center of the primary photosynthetic pigment, chlorophyll *a* (Goldman and Horne 1983).

A summary of the biological functions of calcium and magnesium is presented in Table 3.

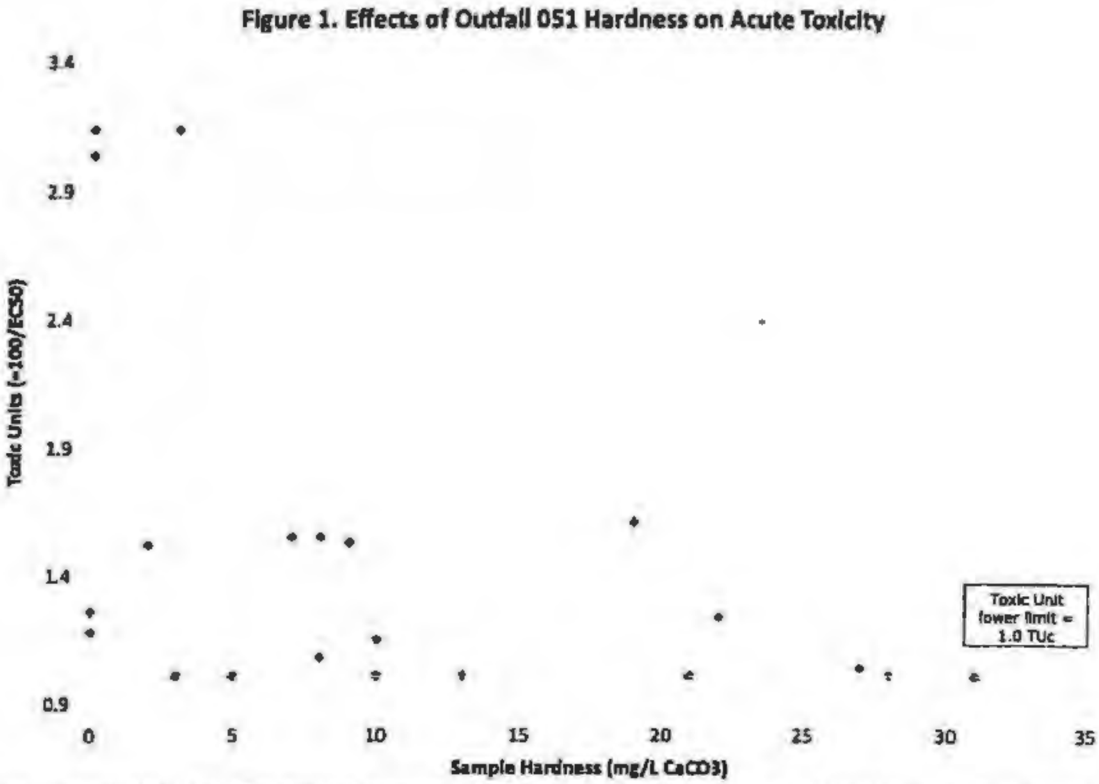
Table 3: Roles of calcium and magnesium in critical biological functions

Micronutrient	Biological Function
Calcium (Ca^{2+})	Regulator of cell permeability Structural component of bone and skeletal structures Antagonistic influence on the uptake of metals Essential for metabolic processes in all living organisms Controlling factor in muscle contraction
Magnesium (Mg^{2+})	Structural component of chlorophyll Involved in function of many enzymes Vital for cell metabolism as the catalyst for transformation of ATP to ADP.

1.3 Low Hardness and Toxicity of RLWTF Outfall 051 Effluent

The roles of calcium and magnesium as essential to organism health appears to be reflected in the results of the 24 acute toxicity tests of the Outfall 051 effluent that PER has performed since 2007: when hardness levels are extremely low, there is generally an increase in the apparent toxicity of the effluent, and when hardness levels are >25 mg/L, virtually no toxicity is observed (Table 4 and Figure 1).

While there seems to be a correlation between extreme low hardness levels and increased toxicity, it is difficult to ascribe that completely to calcium and magnesium deficiencies. While the essential role for Ca^{2+} and Mg^{2+} in organism health is well known, few studies on adverse effects of extreme low hardness on aquatic organisms, and particularly daphnids, have been reported. Cowgill and Milazzo (1991) reported that daphnid (*Daphnia magna* and *Ceriodaphnia dubia*) reproduction declined below hardness levels of 72 mg/L, with 'total number of offspring' EC_{50}'s of 5 mg/L and 38 mg/L, respectively (in this context, EC_{50} is the hardness concentration predicted to have a 50% effect on the organisms). Cowgill and Milazzo also reported that *C. dubia* exhibited signs of stress when water hardness was below 9 mg/L.



Note – Toxic Units (TU) are standard measures of the magnitude of toxicity, where TU > 1 indicates the presence of toxicity, with the magnitude of the toxicity increasing as the TU increases.

Lasier et al. (2006) similarly reported that *C. dubia* cultured in higher hardness waters (~100 mg/L) suffered reduced reproduction when exposed to low-hardness waters (40-50 mg/L); no such effects were observed for low-hardness organisms transferred to high-hardness waters. This suggests that the low hardness of the Outfall 051 effluent could cause adverse effects as it dilutes and lowers the hardness of any downstream ambient waters.

The Outfall 051 effluent is discharged into the Mortandad Canyon "receiving water", which is an ephemeral stream. Generally, the effluent infiltrates below the ground surface within 100 yards downstream of the outfall, although it may reach as far as 1-2 miles downstream before complete infiltration following significant storm events. However, as a precautionary 'worst case scenario' approach, it is responsible to be protective of the downstream aquatic ecosystems that do have established populations of aquatic organisms. The scientific studies cited above suggest that the reduction (and in some cases complete removal) of the hardness that is present in the "tapwater" and "RAW" influent to the low levels observed for the Outfall 051 effluent (and hence, in ambient waters downstream of the Outfall 051 effluent discharge) could directly or indirectly affect downstream receiving waters.

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Sample Collection Date	Sample Hardness (mg/L $CaCO_3$)	NOEC (% Effluent)	EC_{50} (% Effluent)	Toxic Units ($100/EC_{50}$)
1/23/07	5	100	>100	<1
9/27/07	9	56	65.9	1.52
10/30/07	8	56	65.0	1.54
12/12/07	2	56	66.2	1.51
12/19/07	19	56	62.4	1.60
2/25/08	27	100	96.7	1.03
6/25/08	8	75	93.4	1.07
8/6/08	3	100	>100	<1
11/17/08	7	56	64.8	1.54
2/10/09	10	100	>100	<1
4/16/09	13	100	>100	<1
7/9/09	22	75	77.7	1.23
7/28/09	31	100	>100	<1
12/1/09	0	<32[a]	<32[a]	>3.13
1/4/10	0	<32	33	1.33
1/11/10	0	75	79.7	1.25
1/25/10	0	75	85.5	1.17
3/8/10	28	100	>100	<1
3/22/10	10	75	87.6	1.14
4/26/10	3	<32[a]	<32[a]	>3.13
6/8/10	21	100	>100	<1
7/12/10	0	<32	<32	>3.13
7/19/10	0	<32[a]	<32[a]	>3.13
11/18/10	31	100	>100	<1

Table 4: Hardness levels and acute toxicity of LANL Outfall 051 samples (2007-2010)

a – There was complete mortality at all effluent concentrations.

Based upon this information, it is recommended that the hardness of the Outfall 051 effluent be restored to the hardness levels originally present in the "RAW" water prior to discharge. It is worth noting that this is recognized by regulatory agencies in their own guidelines for the performance of Toxicity Identification Evaluations (TIEs): California regulatory guidelines state that after performing ion-exchange treatment, "essential" ions Ca^{2+} and Mg^{2+} be added back to the effluent (Connor and Deanovic 1991).

1.4 Interaction Between Hardness and Contaminant Toxicity

The scientific literature clearly indicates the essentiality of Ca^{2+} and Mg^{2+} in ambient waters in order to maintain the health of aquatic organisms. The observation of toxicity at extreme low hardness levels may also be due in part to the general antagonistic effect of hardness (and particularly Ca^{2+}) on the toxicity of contaminants, and metals in particular. For instance, numerous studies have reported that hardness is protective of metals toxicity to the Outfall 051 test organism *Daphnia pulex* (or to closely-related *Daphnia magna)*, typically with Ca^{2+} having a greater protective effect than Mg^{2+} (Santore et al. 2001; deSchampheleare and Janssen 2002; Heijerick et al., 2002; Naddy et al. 2002; Kozlova et al. 2008; Clifford and McGeer 2009, 2010). In fact, the protective effect of hardness on metals toxicity to a wide variety of aquatic organisms is so well established that contemporary water quality criteria for metals generally are normalized to hardness levels of waters.

Again, the restoration of the hardness levels to the LANL effluent is recommended as a protective measure against potential contaminant toxicity to downstream aquatic organisms and to the *Daphnia pulex* organisms used in the acute toxicity tests of the Outfall 051 effluent.

2. SUMMARY AND CONCLUSIONS

The water used at LANL is a groundwater and has a hardness that is typically ~40-50 mg/L. However, after application of the various wastewater treatment processes at the RLWTF, the hardness of the Outfall 051 effluent has been reduced to levels as low as ~1 mg/L (the annual mean concentrations were approximately 1-3 mg/L, and ranged from 0.2-12 mg/L in 2008-09). This extreme low hardness is of potential concern as the hardness ions Ca^{2+} and Mg^{2+} are essential to maintain the health of aquatic organisms.

The reduction of the concentrations of these essential ions may be reflected in the observation of sporadic acute toxicity of the Outfall 051 effluent, particularly when the hardness is reduced to extremely low levels (e.g., to non-measurable concentrations). In addition, it can be expected that if present, the toxicity of contaminants, and in particular metals such as copper and zinc, will be increased at the extremely low hardness levels.

On that basis, it is highly recommended that LANL consider implementation of measures to restore the hardness of the effluent to the original source water levels. This restoration of hardness is also supported by the fact that regulatory agency guidelines similarly call for the restoration of water hardness levels to those concentrations existing prior to the application of treatment processes that remove Ca^{2+} and Mg^{2+}. In the interim, it is recommended that the effluent samples used for acute toxicity testing with *D. pulex* be amended with the hardness ions Ca^{2+} and Mg^{2+} to restore the hardness to the original "RAW" influent conditions.

3. REFERENCES

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EXHIBIT

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Los Alamos, New Mexico 87545
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Date: September 28, 2011
Refer To: ENV-RCRA-11-0204
LAUR: 11-11554

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) at Los Alamos National Laboratory (the Laboratory) requires the permittees to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The purpose of this letter is to notify the EPA of two process changes at the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). The changes include the use of perchlorate ion exchange and the use of seawater reverse osmosis. In addition, this letter provides updated information about the installation of zero liquid discharge (ZLD) tanks. This notification is being provided even though neither of these process changes will change the nature of or increase the quantity of pollutants discharged at NPDES Outfall 051.

Perchlorate Ion Exchange

In 2002, the RLWTF installed the capability to remove perchlorate via ion exchange. The capability was installed in anticipation of EPA regulations that would limit perchlorate in discharges. To date, the NPDES permit for Outfall 051 has not established a discharge limit for perchlorate, nor has the EPA enacted regulations concerning perchlorate. The Laboratory's NPDES permit does require annual monitoring for perchlorate. Currently, treated water is being discharged to the environment via evaporation or through Outfall 051.

NNSA/LANS will be modifying its treatment process to bypass the perchlorate ion exchange treatment process whenever treated water will be evaporated. Treatment will include ion exchange for perchlorate removal, when water is to be discharged through Outfall 051.

Sea Water Reverse Osmosis

The RLWTF generates secondary waste streams that cannot be processed with existing treatment equipment. These secondary wastes are currently being concentrated in a mechanical waste evaporator at the RLWTF, then shipped for offsite treatment and disposal as low-level radioactive solid waste. NNSA/LANS is currently designing a seawater reverse osmosis (SWRO) treatment unit to replace the existing waste evaporator. Replacement would occur during calendar year 2012.

As with the waste evaporator, SWRO treatment will split the secondary waste into two streams. Concentrate from the SWRO unit will be the equivalent of evaporator bottoms, and will be shipped for offsite treatment and disposal as low-level radioactive solid waste. The second output stream, permeate from the SWRO unit, will be the equivalent of evaporator overheads. This stream will be re-treated through the low-level treatment plant.

ZLD Tanks

NNSA/LANS are currently designing concrete tanks, to be located at TA52, for solar evaporation of water treated at the RLWTF. As shown in the enclosed process schematic (Enclosure 1), these tanks would provide another path for the discharge of treated water to the environment, so that treated waters can be discharged either through Outfall 051, by mechanical evaporation, or by solar evaporation in two locations.

The Zero-Liquid-Discharge (ZLD) Project consists of two portions: two concrete evaporation tanks, and a length of buried transfer piping that will connect the RLWTF to the ZLD tanks. Project completion is scheduled for 2012.

The tank portion of the ZLD Project will be located on a site of approximately one acre, located about two-thirds of a mile from the RLWTF within Technical Area 52 of the Laboratory. The site is located along the north side of Puye Road, bounded on the south by the road, and on the north by a steep drop-off in grade. The ZLD tanks will be constructed with concrete walls approximately four feet high, and will have a double liner with leak detection. Project design provides the capability of returning the contents of the tanks to the RLWTF for storage and retreatment, if necessary. Transfer piping, made of high-density polyethylene (HDPE), will be routed west from the proposed tanks, along Puye road toward the RLWTF. The length of transfer pipe will be approximately 3500 feet.

Enclosure 1 provides a revised schematic for the treatment of wastewater received at RLWTF for your review. The schematic includes the above-described changes to the treatment process.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

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Jim Davis, NMED/RPD, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Carl A. Beard, PADOPS, w/o enc., A102
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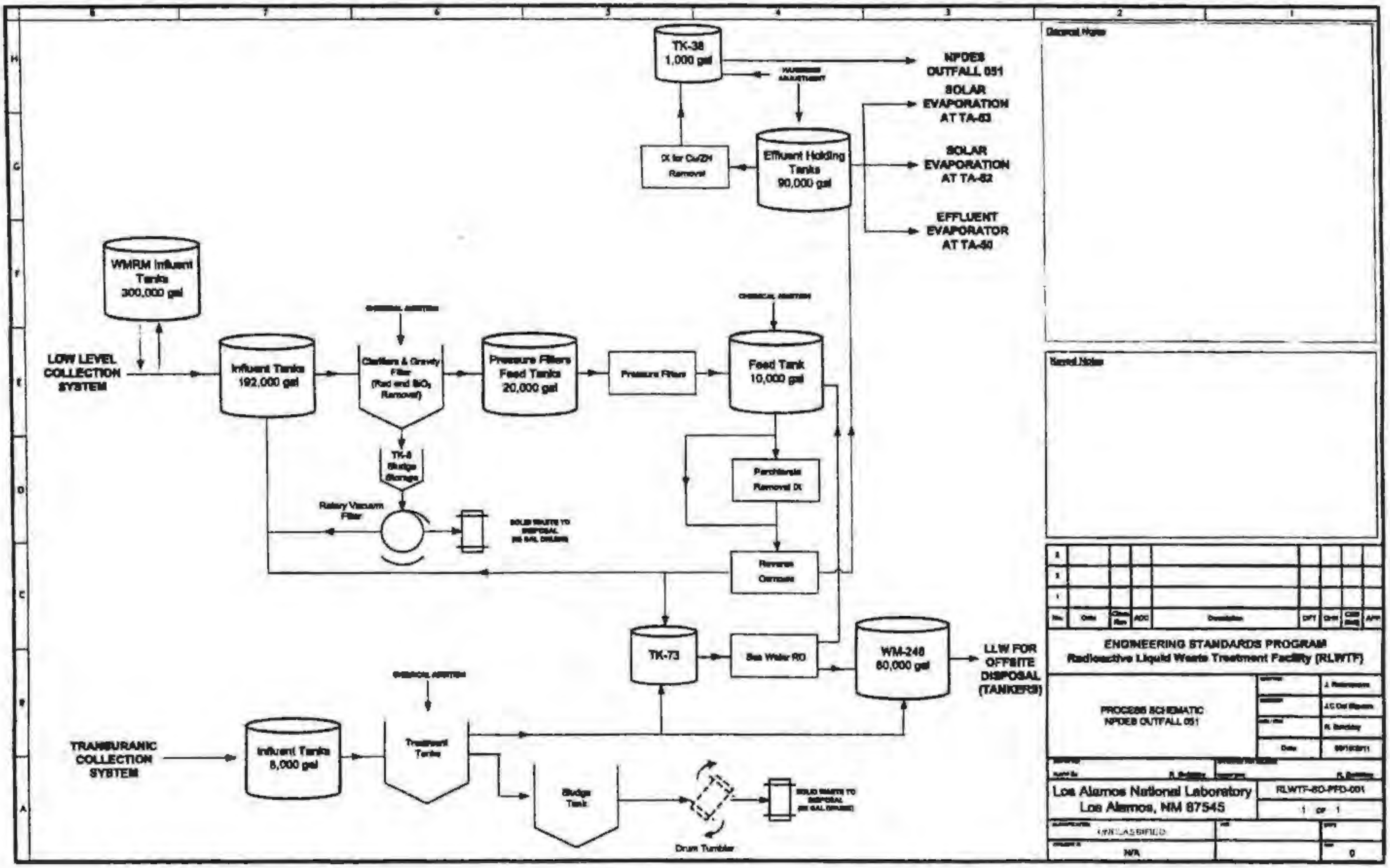
Mike Saladen, ENV-RCRA, w/o enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., A150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Removal
Effluent Holding
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90,000 gal
WMRM Influent
Tanks
300,000 gal
LOW LEVEL
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Influent Tanks
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Pressure Filters
Feed Tanks
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Pressure Filters
Feed Tank
10,000 gal
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Removal IX
Reverse
Osmosis
Rotary Vacuum
Filter
TK-73
Sea Water RO
WM-248
80,000 gal
LLW FOR
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(TANKERS)
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Influent Tanks
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Treatment
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Sludge
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Drum Tumbler
General Notes
Keyed Notes
ENGINEERING STANDARDS PROGRAM
Radioactive Liquid Waste Treatment Facility (RLWTF)
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NPDES OUTFALL 051
Los Alamos National Laboratory
Los Alamos, NM 87545
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Los Alamos
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EXHIBIT
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NMOC 2t permit rcd.

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Date: November 16, 2011
Refer To: ENV-RCRA-11-0251
LAUR: 11-11960

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) at Los Alamos National Laboratory (the Laboratory) requires the permittees to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The purpose of this letter is to notify EPA of changes to the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) process schematic previously submitted with the Notice of Planned Change, dated September 28, 2011 (reference ENV-RCRA-11-0204). The changes include re-naming the two reverse osmosis treatments to "Primary" Reverse Osmosis (formerly Reverse Osmosis) and "Secondary" Reverse Osmosis (formerly Sea Water RO), and the addition of comments explaining that treatments paths can differ depending upon water quality. This notification is being provided for clarification purposes only, even though neither of these name changes will change the nature of or increase the quantity of pollutants discharged at NPDES Outfall 051. Enclosed for your review is a revised schematic for the treatment of wastewater received at RLWTF (Enclosure 1). The revisions have been highlighted.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

Jue Marie Sandoval DGL

for Anthony R. Grieggs
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Los Alamos National Security, LLC

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Gene E Turner

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Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., A150

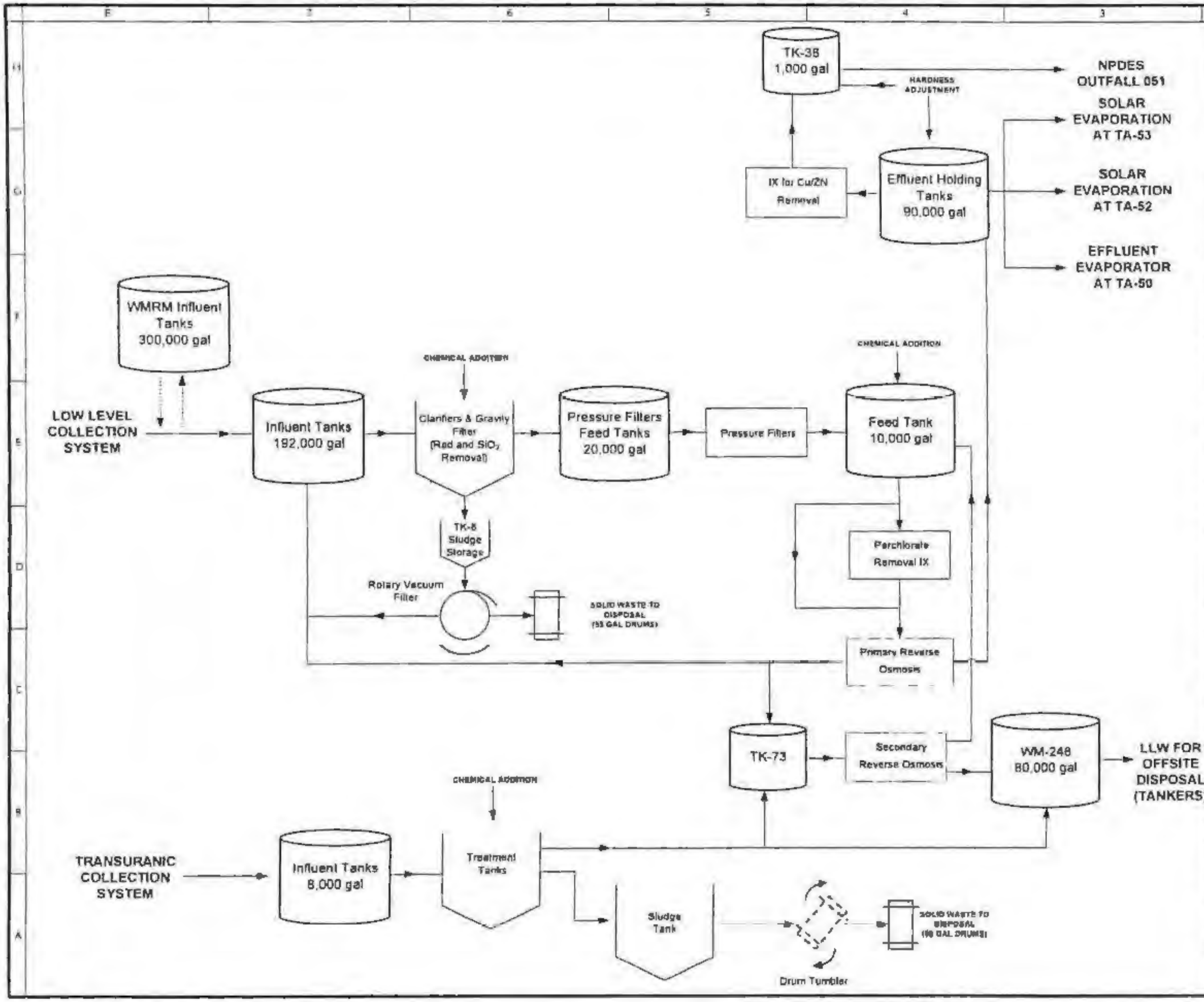
ENCLOSURE 1

Notice of Planned Change
NPDES Permit No. NM0028355

Outfall 051
Process Schematic Revision 11-14-2011

ENV-RCRA-11-0251

LAUR-11-11960



General Notes

NOTES

THIS PROCESS SCHEMATIC DEPICTS TYPICAL FLOW PATHS WHEN TREATING WATER AT THE TA50 RLWTF. ACTUAL TREATMENT MAY VARY DEPENDING UPON WATER QUALITY. FOR EXAMPLE, WATER FROM THE CLARIFIER MAY BE SENT TO EITHER THE GRAVITY FILTER OR THE PRESSURE FILTERS, THUS BYPASSING A SET OF FILTERS, OR PERMEATE FROM THE SECONDARY RO UNIT MAY BE SENT TO EFFLUENT HOLDING TANKS RATHER THAN TO THE PERCHLORATE FEED TANK.

No.	Date	Class Rev	ADC	Description	DFT	CHK	CSE SME	APP
3								
2								
1	10/31/2011	I	U	CHANGES FROM WQH - RLW MEETING	JCA	JCDS	RLS	

ENGINEERING STANDARDS PROGRAM
Radioactive Liquid Waste Treatment Facility (RLWTF)

PROCESS SCHEMATIC
NPDES OUTFALL 051

	J. Kulgnavarro
	J.C. Del Signore
	R. Swickley
Date	10/31/2011

R. Swickley | R. Swickley

Los Alamos National Laboratory
Los Alamos, NM 87545

RLWTF-SD-PFD-001

1 OF 1

UNCLASSIFIED

N/A

1

ENV-RCRA-11-0251

11-11960

NMKN 2535
Permit Proc.

EXHIBIT
V

Los Alamos

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
505-667-0666

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87545
(505) 667-5794/FAX (505) 667-5948

Date: JUL 25 2013
Symbol: ENV-DO-13-0082
LAUR: 13-25308

RECEIVED
JUL 29 2013
SURFACE WATER

Mr. Jerry Schoeppner, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Schoeppner:

SUBJECT: NOTIFICATION OF PLANNED CHANGE, NEW MICROFILTER TREATMENT UNIT, RADIOACTIVE LIQUID WASTE TREATMENT FACILITY, DP-1132

The U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) are notifying you of a planned change in the operating conditions at the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF) at Los Alamos National Laboratory. The New Mexico Environment Department (NMED) was previously notified of the installation of a new microfilter treatment unit in the August 2012 supplement to Discharge Permit Application DP-1132 (ENV-RCRA-12-0173) and in a September 2012 communication to the Environmental Protection Agency (ENV-RCRA-12-0205). The installation of the microfilter treatment unit is a necessary project to replace the 14-yr old tubular ultrafilter (TUF) treatment unit.

Enclosure 1 is the technical specifications cut sheet for Model No. EF/EFC-424 membrane microfiltration unit installed at the TA-50 RLWTF. Enclosure 2 is a process schematic showing the location of the microfilter within the RLWTF's low-level treatment system. And Enclosure 3 is a floor plan of the RLWTF showing the physical location of the microfilter within TA-50 Building 1.

Currently, DOE/LANS are conducting a readiness review of the microfilter. Startup is expected before the end of CY2013.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/lm

Enclosures
1. Siemens Technical Specifications Cut Sheet for the RLWTF's Microfilter Treatment Unit
2. Process Schematic of Low-Level Treatment Operations at the RLWTF
3. Floor Plan of the RLWTF Low-Level Treatment Units

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, w/enc.
John E. Kieling, NMED/HWB, Santa Fe, NM, w/enc.
Stephen M. Yanicak, NMED/DOE/OB, w/enc., (E-File)
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ENV-CP Correspondence File, w/enc., K490

ENCLOSURE 1

Siemens Technical Specifications Cut Sheet for the
RLWTF's Microfilter Treatment Unit

ENV-DO-13-0082

LAUR-13-25308

Date: JUL 25 2013

Membrane Microfiltration Systems (EF and EFC Series)

Microfiltration Systems

The Siemens tubular polymeric microfiltration systems are skid-mounted and factory assembled. The factory assembly, including wiring and testing, ensures easy reassembly and installation.

The tubular membranes are designed for very high solids loadings and can operate with up to 2.0 to 5.0 weight percent solids. The KYNAR® membrane is very chemically inert so it can withstand pH ranges from 0.0 to 14.0 standard units.

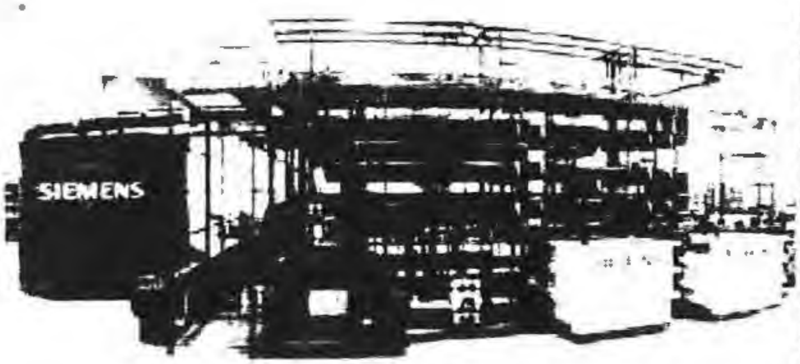
The rugged membranes are non-plugging, abrasive and chlorine resistant. All materials in contact with the wastewater or cleaning solutions are either PVC, polyethylene, stainless steel or other corrosion resistant materials.

The membrane provides for an absolute barrier to the passage of solids and therefore is capable of removing metals (and other contaminants) to their solubility limits.

This also results in the removal of most colloids and therefore provides a filtrate that exhibits a very low SDI, making the filtrate a perfect feed for a reverse osmosis unit or other polishing technology.

A fully automatic backpulse mechanism is included to periodically cause a reverse flow of filtrate across the membrane, dislodging contaminants and allowing the high velocity flow to sweep them away. The backpulse prolongs the on-line cycles and reduces the cleaning requirements.

Each system is supplied fully assembled with all necessary equipment for operation, including a piped-in-place cleaning system, which includes two tanks and a dedicated cleaning pump. Units are designed for automatic operation and can be supplied with a fully automated cleaning cycle if required.



EFC-7200

Features

- PVDF (KYNAR®) membrane provides excellent chemical resistance and long life
- Tubular design allows for high solids loading
- Piped-in-place cleaning system is standard on all units
- Units are skid-mounted
- Rapid installation assured by skidded assemblies and mistake proof electrical connections

Membrane Microfiltration Systems (EF and EFC Series)

Specifications								
Model Number	EF/EFC-400	EF/EFC-424	EF/EFC-1200	EF/EFC-2400	EF/EFC-3600	EF/EFC-4800	EF/EFC-7200	EF/EFC-10800
Capacity (Nominal)	4-24 gpm 1-5.5 m^3/hr	8-48 gpm 2-11 m^3/hr	8-48 gpm 1.8-11 m^3/hr	20-96 gpm 4.5-22 m^3/hr	36-144 gpm 8-33 m^3/hr	42-192 gpm 9-43 m^3/hr	72-288 gpm 16-65 m^3/hr	108-322 gpm 4-98 m^3/hr
Tubes per Module	4	4	10	10	10	10	10	10
Quantity (min-max)	4-12	8-24	6-12	12-24	18-36	24-48	36-72	54-108
Concentration Tank Volume (Note: Included with EFC Series only.)	275 gallons 1.0 m^3	550 gallons 2.1 m^3	660 gallons 2.5 m^3	1,375 gallons 5.2 m^3	1,700 gallons 6.4 m^3	2,600 gallons 9.8 m^3	4,280 gallons 16.2 m^3	5,000 gallons 18.9 m^3
Process Pump(s)	Qty. 1 7.5 HP	Qty. 1 15 HP	Qty. 1 20 HP	Qty. 1 30 HP	Qty. 1 50 HP	Qty. 2 30 HP	Qty. 2 50 HP	Qty. 3 50 HP
Dimensions (L x W x H)	11'-10" x 4'-10" x 11" 3,607 x 1,473 x 2,718 mm	18'-3" x 5'-4" x 11'-7" 5,563 x 1,626 x 3,531 mm	24'-7" x 5'-10" x 9'-10" 7,493 x 1,778 x 2,997 mm	25'-5" x 7'-1" x 10'-0" 7,747 x 2,159 x 3,048 mm	33'-0" x 8'-1" x 11'-10" 10,058 x 2,464 x 3,607 mm	26'-9" x 9'-6" x 11'-3" 8,153 x 2,896 x 3,429 mm	37'-10" x 17'-1" x 11'-11" 11,532 x 5,207 x 3,632 mm	39'-4" x 25'-3" x 11'-11" 11,989 x 7,696 x 3,632 mm
Shipping Weight	1,000 lbs 450 kg	2,000 lbs 900 kg	7,500 lbs 3,400 kg	10,000 lbs 4,550 kg	15,000 lbs 6,800 kg	18,000 lbs 8,160 kg	29,000 lbs 13,150 kg	43,000 lbs 19,500 kg
Operating Weight	4,000 lbs 1,810 kg	8,000 lbs 3,630 kg	18,000 lbs 8,160 kg	26,000 lbs 11,800 kg	34,000 lbs 15,420 kg	52,000 lbs 23,590 kg	73,000 lbs 33,110 kg	98,000 lbs 44,450 kg

The model selected by the RLWTF is the EF/EFC-424 unit with 20 tubes.

Siemens
Water Technologies
2000 Marconi Drive
Warrendale, PA 15086
866.525.0621 Toll Free
724.772.6520 Phone
724.772.6521 Fax

ENCLOSURE 2

Process Schematic of Low-Level Treatment Operations at the RLWTF

ENV-DO-13-0082

LAUR-13-25308

Date: JUL 25 2013

(DIAGRAM OMITTED)

ENCLOSURE 3

Floor Plan of the RLWTF Low-Level
Treatment Units

ENV-DO-13-0082

LAUR-13-25308

Date: JUL 25 2013

(DIAGRAM OMITTED)

Los Alamos
NATIONAL LABORATORY
EST 1943

EXHIBIT
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W

Environmental Safety & Health
Environmental Protection Division
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Department of Energy
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: January 27, 2012
Refer To: ENV-DO-12-0002

12:27
FEB 0 2 2012
SURFACE WATER
QUALITY BUREAU

Ms. Claudia Hosch, Chief
NPDES Permits and TMDL Branch (6WQ)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Ms. Hosch:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, 2012 NPDES PERMIT RE-APPLICATION

Enclosed are one original and one copy of the application (Volumes I and II) for renewal of the National Pollutant Discharge Elimination System (NPDES) reference Permit No. NM0028355 for the Los Alamos National Laboratory (LANL). This Permit Re-Application is being submitted by the U.S. Department of Energy (DOE) and the Los Alamos National Security (LANS), LLC in accordance with the requirements of 40 CFR 122.21 and the current NPDES permit. This Permit Re-Application includes: (1) an introduction addressing environmental and other conditions at LANL; (2) completed U.S. Environmental Protection Agency (EPA) Form 1- "General Information"; (3) completed EPA Form 2C – "Existing Manufacturing, Commercial, Mining and Silvicultural Operations" covering 11 outfalls; and (4) other information submitted in support of this Permit Re-Application.

The information used in preparation of this Permit Re-Application was collected at affected outfalls over a 5-year period and represents the best information available to the applicants at the present time.

DOE/LANS appreciate the assistance provided by Mr. Isaac Chen, Region 6 Permit Writer, regarding the preparation of this Permit Re-Application. DOE/LANS will continue to work closely with EPA during the Permit development process in order to provide a new Permit, which meets all applicable regulatory requirements under the Clean Water Act.

If you need additional information regarding the Permit Re-Application, please contact Gene Turner, DOE, at (505) 667-5794 or Mike Saladen, LANS, at (505) 665-6085.

Sincerely,

Alison Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security, LLC

Sincerely,

Kevin W. Smith
Manager
Department of Energy
Los Alamos Site Office

AD:GT:MS/lm

Enclosures: a/s

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Jerry Schoeppner, NMED/GWQB, Santa Fe, NM, w/o enc.
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Lisa Cummings, LASO-OC, w/o enc., A316
Carl A. Beard, PADOPS, w/o enc., A102
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Marc Bailey, ENV-RCRA, w/o enc., K490, (E-File)
Taylor Valdez, File, w/o enc., K404, (E-file)
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA File (12-0026), w/enc., M704
IRM-RMMSO, w/enc., A150

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division – Water Quality and RCRA Group (ENV-RCRA)

LOS ALAMOS NATIONAL LABORATORY

NPDES Permit Re-Application
Permit No. NM0028355
Volume I

February 2012

LA-UR-12-00359

Los Alamos
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EST. 1943

Environmental Protection Division – Water Quality and RCRA Group (ENV-RCRA)

LOS ALAMOS NATIONAL LABORATORY

LA-UR-12-00359
2012 NPDES Permit Re-Application
Permit No. NM 0028355

For
Los Alamos National Laboratory
Los Alamos, NM

Submitted By
U.S. Department of Energy– Los Alamos Site Office and Los Alamos National Security, LLC

Prepared By
Los Alamos National Laboratory
Water Quality & RCRA Group (ENV-RCRA)

February 2012

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4.1	Process Flow Diagram for LANLs Outfall Reduction Strategy

TABLES

No.	Title
2.1	Summary of NPDES Permit Activities at the Laboratory
4.1	NPDES Industrial Point Source Outfalls to be Re-permitted
4.2	Outfall 001 Discharge Sources

ATTACHMENTS

No.	Title
Form 1	U.S. Environmental Protection Agency (EPA) Form 1- "General Information"
001	Outfall 001 – Fact Sheet, Photographs, DMR Summary, and Form 2C
13S	Outfall 13S – Fact Sheet, Photographs, DMR Summary, and Form 2C
051	Outfall 051 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A022	Outfall 03A022 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A027	Outfall 03A027 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A048	Outfall 03A048 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A113	Outfall 03A113 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A160	Outfall 03A160 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A181	Outfall 03A181 – Fact Sheet, Photographs, DMR Summary, and Form 2C
03A199	Outfall 03A199 – Fact Sheet, Photographs, DMR Summary, and Form 2C
05A055	Outfall 05A055 – Fact Sheet, Photographs, DMR Summary, and Form 2C

APPENDICES

No.	Title
A	Historical and Existing NPDES Outfall Status Summary
B	Notice of Changed Condition/Planned Changes (August 2007 – September 2011)
C	Other Environmental Permits at LANL
D	Hazardous Waste Management Facility Maps and Listing of the Hazardous Waste Treatment Process Codes
E	Signatory Authority Letter
F	LA-14420-PR, Surface Water Data at Los Alamos National Laboratory – 2009 Water Year
G	Map of Spring and NPDES Outfall Locations
H	2010 Drinking Water Quality Data Report
I	Map of the Sanitary Waste Water System (SWWS) Plant Collection System
J	Map of the Radioactive Liquid Waste Collection System
K	LA-UR-11-01005, Radioactive Liquid Waste Treatment Facility Annual Report for 2009, February 2011
L	Sanitary Effluent Reclamation Facility (SERF)
M	LANL Policies and Procedures
N	Waste Acceptance Criteria for TA-50 RLWTF, TA-46 SWWS, and TA-16 HEWTF
O	Executive Summary of Implementation Plan
P	Sampling and Analysis Plan for Los Alamos National Laboratory's NPDES Permit Re-Application, August 2011

ACRONYMS/ABBREVIATIONS

CGP	Construction General Permit
CWA	Clean Water Act
DOE	U.S. Department of Energy
DP	Discharge Plan
EA	Environmental Assessment
ENV-DO	Environmental Protection Division
EPA	Environmental Protection Agency
ft	Feet/foot
HEWTF	High Explosives Wastewater Treatment Facility
IP	Individual Permit
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
LDCC	Laboratory Data Communications Center
MSGP	Multi-Sector General Permit
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
RCRA	Resource Conservation and Recovery Act
RLWTF	Radioactive Liquid Waste Treatment Facility
SAP	Sampling and Analysis Plan
SERF	Sanitary Effluent Reclamation Facility
SMO	Sample management office
SWEIS	Site Wide Environmental Impact Statement
SWWS	Sanitary Waste Water System
TA	Technical Area
TRU	Transuranic
WAC	Waste Acceptance Criteria
WCATS	Waste Compliance and Tracking System
WMC	Waste Management Coordinator
WPF	Waste Profile Form
ZLD	Zero Liquid Discharge

1.0 INTRODUCTION

The current Los Alamos National Laboratory (LANL or Laboratory), National Pollutant Discharge Elimination System (NPDES) Industrial Discharge Permit No. NM0028355 will expire July 31, 2012. The NPDES permit and regulations require the Permittees to submit a re-application 180 days prior to the expiration of the existing permit, February 2, 2012. This document serves as the 2012 NPDES Permit Re-Application package for the renewal of NPDES Permit No. NM0028355 submitted to the U.S. Environmental Protection Agency (EPA) by the U.S. Department of Energy (DOE) and the Los Alamos National Security (LANS) LLC. The DOE/NNSA and LANS are hereinafter referred to as the "co-permittees or permittees."

This 2012 NPDES Permit Re-Application package has been prepared and is submitted in accordance with the provisions of the Clean Water Act (CWA) (33 U.S.C. 1251 – 1387) and the NPDES Permit Program requirements provided in 40 CFR 122.21. It is the intent of the package to provide the EPA permit writer, New Mexico Environment Department (NMED) and others with adequate background information concerning each outfall, the surrounding environmental conditions, and associated future activities at the Laboratory to promote review of the technical data and preparation of the permit. The Permittees would like to invite EPA representatives to visit the Laboratory during the review process to gain firsthand knowledge and understanding of the information provided, identify potential issues, and answer any questions regarding proposed changes to the permitted outfalls and NPDES facilities presented in this re-application package.

Due to the complex nature of the NPDES Permit Re-Application and potential need for supplemental information, the applicant requests that all previous applications, modifications, maps, data, and pertinent correspondence submitted in reference to NPDES Permit No. NM0028355 transmitted to the EPA up to the time the new permit is issued, be considered part of this re-application. The applicant will continue to provide copies of all such information to the EPA Permit Writer as new information becomes available.

2.0 BACKGROUND

The existing NPDES Industrial Discharge Permit became effective on August 1, 2007. It originally included 17 outfalls located at seven (7) Technical Areas (TAs) spread out over a approximately 40 square mile area within the Laboratory boundaries. The LANL NPDES Industrial Discharge Permit has been historically administered through categorical classification of wastewater discharges. The remaining 11 outfalls currently permitted are grouped into the following five (5) major waste stream categories:

- Power Plant/Sanitary Effluent Reclamation Facility (SERF) Discharge (001)
- Treated Cooling Water Discharges (03A)
- High Explosives Wastewater Discharge (05A)
- Sanitary Wastewater Discharge (13S)
- Radioactive Liquid Wastewater Discharge (051)

NPDES Permit No. NM0028355 is currently the only active NPDES Industrial Outfall Discharge permit at the Laboratory. Table 1 summarizes the permit activities associated with Permit No. NM0028355 over the last 21 years.

Table 2.1
Summary of NPDES Permit Activity at the Laboratory

Application		NPDES Permit		Outfalls Eliminated and/or Removed
Date	No. Outfalls	Effective Date	No. Remaining Outfalls	
Prior to 1990	141	NA	NA	• 24 outfalls eliminated prior to the effective date of the first permit.
1990	117	Sept 1, 2003	34	• 83 outfalls were eliminated due to the completion of the Waste Stream Characterization and Corrections Project and the Outfall Reduction Project.
1998	35	Feb 1, 2001	21	• 14 outfalls were not permitted because the supply wells associated with them were transferred from DOE to Los Alamos County before the permit was issued. • Request made to EPA to delete 4 outfalls (03A024, 03A047, 03A049, and 05A097) in August of 2004 because they were no longer in use.
2004	17	Aug 1, 2007	15	• 03A158 was not permitted because the TA-21-209 cooling tower was decommissioned and the outfall eliminated before the permit was issued. • 03A028 was not permitted because the TA-15-185 and TA-15-202 Phermex facilities were decommissioned before the permit was issued. • 03A021 and 03A185 were tied to the Sanitary Waste Water System (SWWS) Plant in 2010 as part of the Outfall Reduction Project. Outfalls 02A129 (TA-21 Steam Plant) and 03A130 (TA-11 cooling tower) no longer discharge to the environment. EPA deleted these 4 outfalls from the Laboratory's permit on October 11, 2011.

Appendix A provides a list of all historical and existing outfalls and provides a status summary.

2.1 NPDES Outfall Reduction Projects

In December 2007 DOE/LANS completed LA-UR-07-8312, *NPDES Permit Compliance and Outfall Reduction Strategy,* which provided recommendations and options for the treatment, reduction, and/or elimination of the outfalls at LANL. The report was prepared to assess the potential for outfall reductions in response to the more stringent effluent discharge limits provided in the NPDES Permit that became effective on August 1, 2007. The report recommended projects to eliminate thirteen (13) outfalls. Six of them have since been removed either due to decontamination and decommissioning activities at the Laboratory or the implementation of one of the Outfall Reduction Projects identified in LA-UR-07-8312. There are four (4) additional outfalls identified for elimination/reduction over the next 2 – 5 years. These include 03A027, 03A160, 03A181, and 03A199, which will likely be connected to the Sanitary Waste Water System (SWWS) Plant or directly to the SERF. This permit re-application package describes the strategy for each outfall in Section 4.0.

A National Environmental Policy Act (NEPA) categorical exclusion for the Waste Stream Corrections Project (i.e., Outfall Reduction Project) was issued by DOE in January 1996 and an *Environmental Assessment (EA) for Effluent Reduction* was completed by the Permittees in September 1996.

This categorical exclusion and EA support the reduction/elimination of the discharges from all of the Laboratory outfalls except the following:

- Outfall 001, TA-3-22 Power Plant
- Outfall 05A055, TA-16 High Explosives Wastewater Treatment Facility (HEWTF)
- Outfall 13S, TA-46 SWWS Plant
- Outfall 051, TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF)
- Outfall 03A199, Laboratory Data Communications Center (LDCC) Cooling Tower

The TA-16 HEWTF (Outfall 05A055) was analyzed separately and was determined to be covered under an existing DOE-approved categorical exclusion for Safety and Environmental Improvements at LANL. The outfall reduction project for RLWTF (Outfall 051) was included as an option in the 2008 Site Wide Environmental Impact Statement (SWEIS) (DOE, 2008). In September 2008, NNSA issued the first Record of Decision for the 2008 SWEIS. The DOE chose to implement the No Action Alternative with the addition of some elements of the Expanded Operations Alternative. Final design of a new RLWTF and design and construction of the Zero Liquid Discharge (ZLD) component were part of the elements of the Expanded Operations Alternative that were approved to move forward. Mitigation commitments associated with this project are included in the Mitigation Action Plan for the 2008 SWEIS.

In 2008, the PR-ID documentation was submitted for the proposed actions reducing or eliminating discharges from the LDCC Cooling Tower (Outfall 03A199); TA-46 SWWS (13S); and the TA-3 Power Plant (Outfall 001). In August 2010, an EA for the Expansion of the SERF and Environmental Restoration of Reach S-2 of Sandia Canyon at LANL (DOE EA-1736) and associated Finding of No Significant Impacts was issued by the NNSA. The NNSA determined that by using adaptive management practices in the implementation of specific resource mitigation commitments, the potential for adverse environmental effects from the proposed actions would be minimal.

2.2 Notices of Changed Conditions/Planned Changes

The existing permit requires the Permittees to give notice to the EPA of any planned physical alterations or additions that could significantly change the nature or increase the quantity and/or quality of pollutants discharged from any of its permitted outfalls. The existing permit at LANL was implemented in August 2007 and includes 23 Notices of Changed Condition/Planned Change. Appendix B provides a copy of each Notice of Changed Condition/Planned Change that was submitted to the EPA from August 2007 through December 2011.

2.3 Other Environmental Permits

The EPA and NMED regulate Laboratory operations under various environmental statutes (e.g., Clean Air Act, Clean Water Act, etc.) through operating permits, construction approvals, and the DOE/NMED Consent Order. These permits are designed by the regulatory agencies to allow Laboratory operations to be conducted while assuring that the public, air, land, soils, water, and biota are protected. Appendix C provides a detailed list of the other environmental permits at LANL.

The following bullets provide a summary:

- **NPDES Construction General Permit**: The Construction General Permit (CGP) regulates storm water discharges from construction activities disturbing one or more acres, including those construction activities that are part of a larger common plan of development collectively disturbing one or more acres. LANS and the general contractor apply individually for NPDES CGP coverage and are co-permittees at most construction sites. Compliance with the NPDES CGP includes developing and implementing a Storm Water Pollution Prevention Plan before soil disturbance can begin, conducting site inspections once soil disturbance has commenced and continues through final stabilization. There are currently 16 Active Construction General Permit Notice of Intent documents at LANL (Appendix C).

- **NPDES Storm Water Multi-Sector General Permit (MSGP):** The NPDES Industrial Storm Water Permit Program regulates storm water discharges from identified regulated industrial activities and their associated facilities. These activities include metal fabrication; hazardous waste treatment and storage; vehicle and equipment maintenance; recycling activities; electricity generation; warehousing activities; and asphalt manufacturing. LANS and DOE are co-permittees under the EPA 2008 NPDES Storm Water MSGP for Industrial Activities (MSGP-2008). The current MSGP was effective September 29, 2008.

- **NPDES Permit No. NM0030759 – Storm Water Individual Permit:** The Individual Permit (IP) authorizes the discharge of storm water associated with industrial activities at the Laboratory from specified solid waste management units and areas of concern. It contains non-numeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program, to minimize pollutants in storm water discharges. It requires the Permittees to implement site-specific control measures (including best management practices) to address the non-numeric technology-based effluent limits as necessary to minimize pollutants in their storm water discharges. The current NPDES IP Permit, incorporating the latest modifications, became effective on November 1, 2010.

- **U.S. Army Corps of Engineer, Section 401/404 Dredge and Fill Permits:** DOE/LANS are responsible for making sure that it is in compliance with the CWA Sections 401 and 404. Section 401 requires state certification when applying for a federal permit to either build or operate a facility that has a potential to discharge pollutants into any body of water. The purpose of these requirements and subsequent permits are to ensure that the surface water quality is protected from unregulated discharge of dredged or fill material. Appendix C identifies the Section 404 Dredge and Fill Permits that LANL currently has on file with the U.S. Army Corps of Engineers.

- **Septic Tank Permits:** Historically, LANL septic systems were either registered or permitted by the State of New Mexico, Environmental Improvement Division, under the Liquid Waste Disposal and Treatment Regulations (20.7.3 NMAC). DOE/LANS originally submitted a Discharge Plan (DP) application for the LANL septic systems on April 28, 2006. On June 22, 2010 DOE/LANS resubmitted an up-to-date Discharge Plan Application (DP-1589) for the domestic septic tanks/leachfield systems currently in operation at the Laboratory. Appendix C provides a list of the current septic systems covered under DP-1589.

- **NM0890010515-1 Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit:** The RCRA permit regulates storage and treatment of hazardous wastes; the Laboratory disposes all hazardous waste off-site. The Laboratory's hazardous waste facility permit was initially granted in 1989 for storage and treatment operations. The current RCRA Hazardous Waste Permit became effective on December 30, 2010. Appendix D provides maps of the Hazardous Waste Management Facilities and a listing of the Hazardous Waste Treatment Process Codes.

- **P100R1 Air Quality Operating Permit:** The Federal Clean Air Act Operating Permit provides the terms and conditions that must be followed in order to operate applicable air emission sources (i.e., boilers, electric generators, power plant, a combustion turbine generator, a data disintegrator, two carpenter shops, a degreaser, and an asphalt plant) at the Laboratory. The Laboratory also reports emissions from chemical use associated with research and development and permitted beryllium activities. The current Air Quality Operating Permit became effective on August 7, 2009.

- **Groundwater Discharge Plans:** New Mexico Water Quality Control Commission regulations control liquid discharges onto or below the ground surface to protect all groundwater in New Mexico. Under the regulations, when required by NMED, a facility must submit a discharge plan and obtain a permit from the NMED (or approval from the New Mexico Oil Conservation Division for energy/mineral-extraction activities). Subsequent discharges must be consistent with the terms and conditions of the discharge permit. The Laboratory has one discharge permit (TA-46 SWWS Plant Discharge Permit [DP-857]) and two discharge plans are pending NMED approval (TA-50 RLWTF Discharge Plan [DP-1132] and Domestic Septic Tank/Leachfield Systems Discharge Plan [DP-1589]).

3.0 FACILITY DESCRIPTION

The Laboratory and the associated residential and commercial areas of Los Alamos and White Rock are located in Los Alamos County, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe (see Figure 3.1). The 40-square-mile Laboratory is situated on the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep east-to-west- oriented canyons cut by streams. Mesa tops range in elevation from approximately 7,800 feet (ft) on the flanks of the Jemez Mountains to about 6,200 ft at the edge of White Rock Canyon. Most Laboratory and community developments are confined to the mesa tops. The surrounding land is largely undeveloped and large tracts of land north, west, and south of the Laboratory site are held by the Santa Fe National Forest, the US Bureau of Land Management, National Park Service, the US General Services Administration, and Los Alamos County. The Pueblo de San Ildefonso borders the Laboratory to the east. The Laboratory is divided into 48 TAs (not including TA-0, which comprises leased space within the Los Alamos town site) covering 25,600 acres (see Figure 3.2).

3.1 Laboratory Research Activities

The Laboratory is a complex organization comprised of multiple disciplines and programs that include stockpile stewardship and extensive basic research in physics, chemistry, metallurgy, mathematics, computers, earth sciences, and electronics. Its original mission to design, develop, and test nuclear weapons has broadened and evolved as technologies, priorities, and the world community have changed. The Laboratory defines its vision as: "Los Alamos, the premier national security science laboratory." The current mission is to develop and apply science and technology to ensure the safety and reliability of the United States' nuclear deterrent; reduce global threats; and solve other emerging national security challenges.

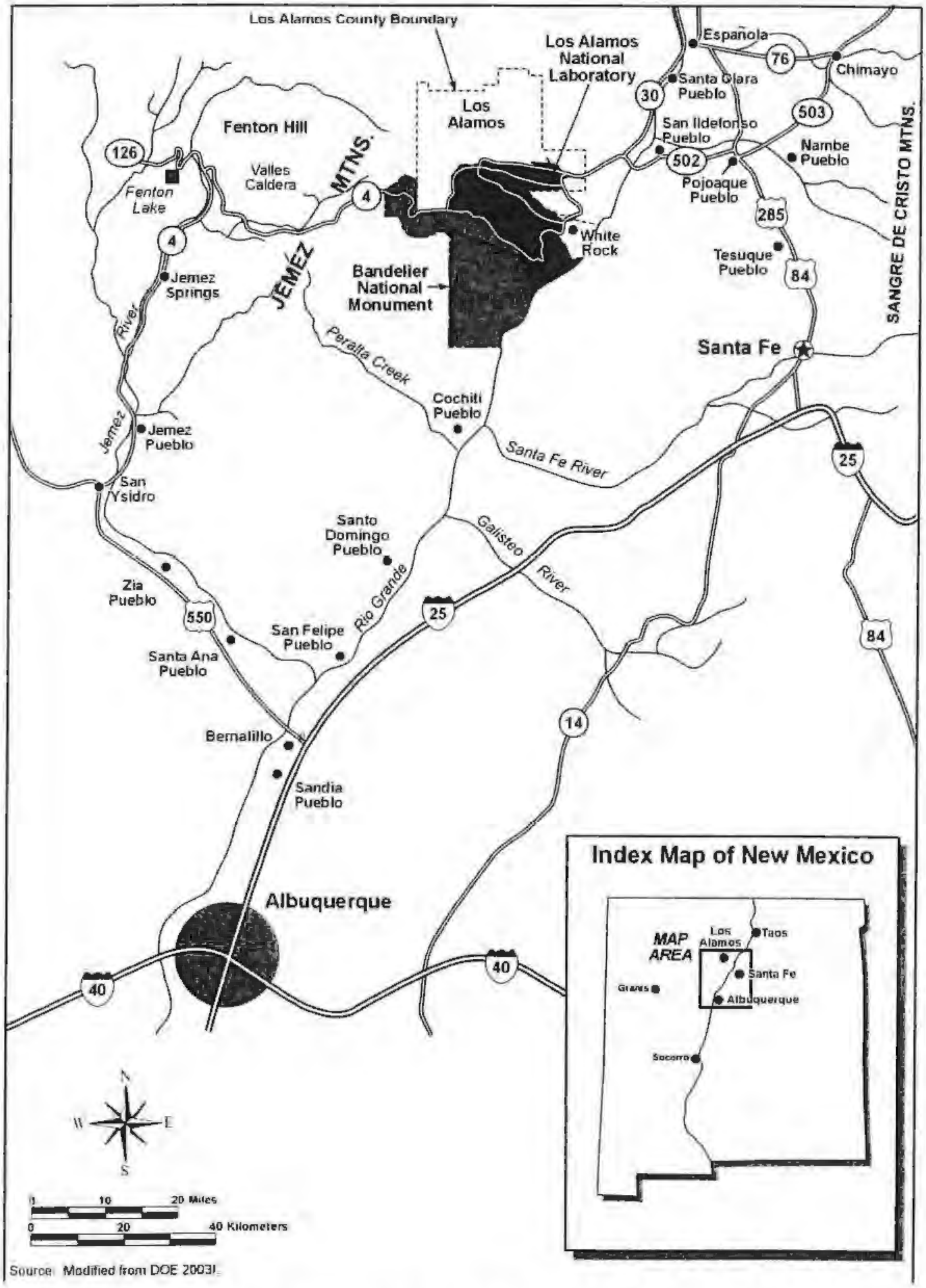


Figure 3.1 - Location of Los Alamos National Laboratory

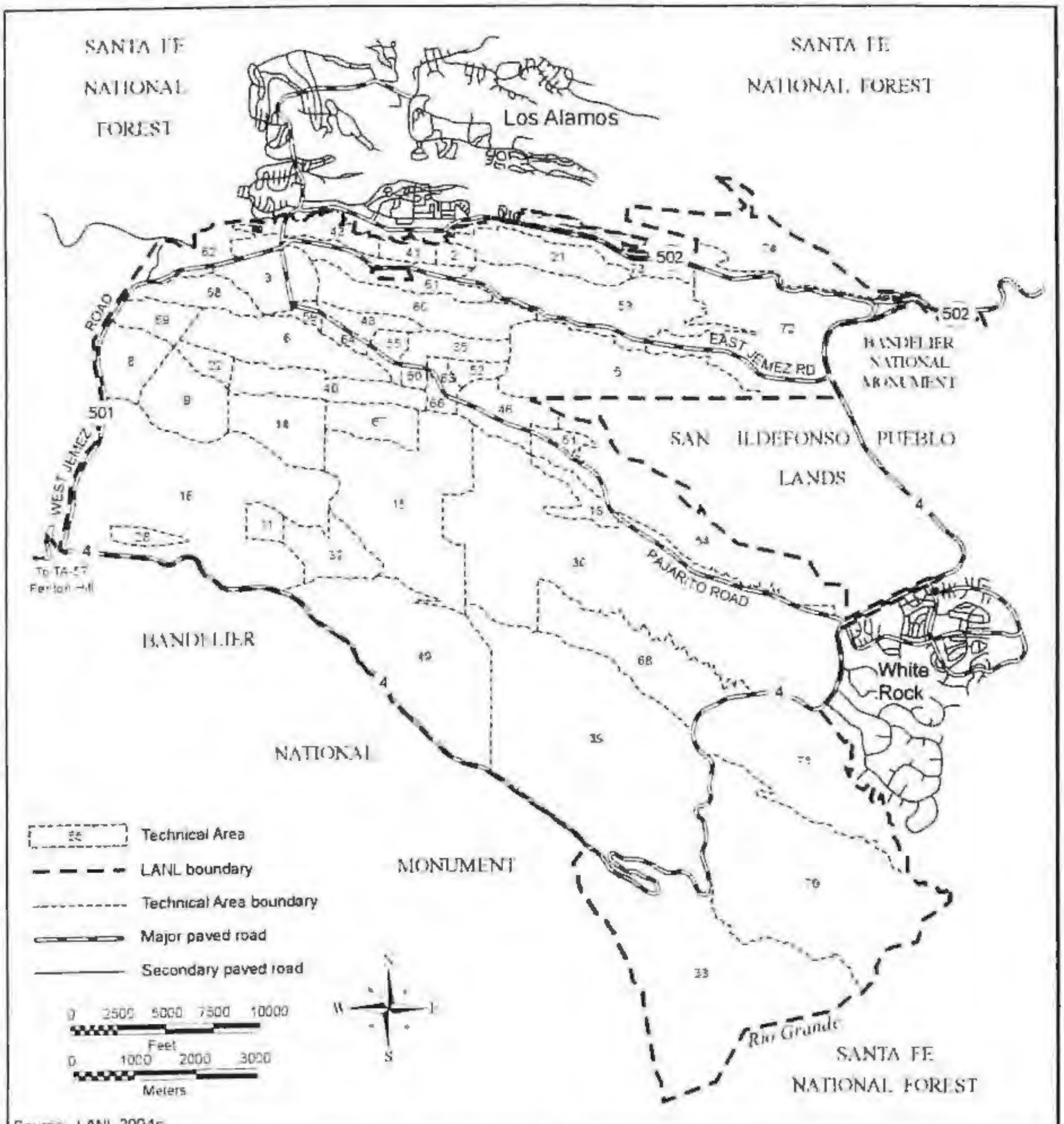


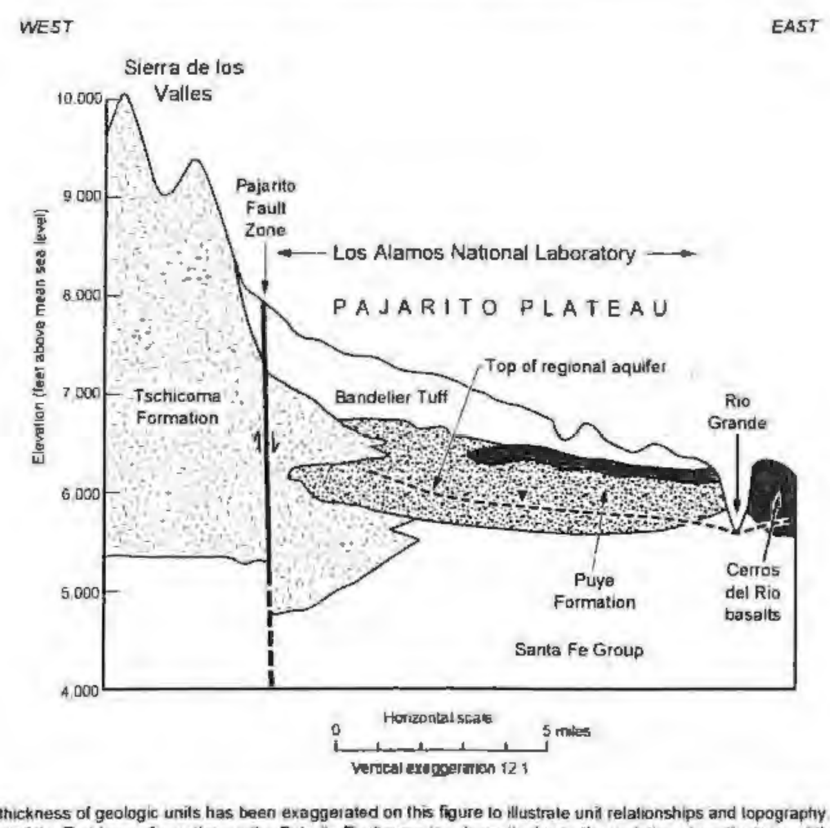
Figure 3.2 - Technical Areas of Los Alamos National Laboratory

3.2 Organization

The Laboratory is currently operated by LANS on behalf of the DOE and thus is a co-permittee of the NPDES Permit. LANS is responsible for all Laboratory site compliance. The Environmental Protection Division (ENV-DO) provides environmental protection leadership, service, and support to meet the Laboratory's environmental protection obligations and public assurance needs. LANS senior management has delegated the authority and responsibility to the ENV-DO Division Leader (Appendix E) to act as the certifying official for environmental compliance permits and documents. The ENV Division Leader will be a signatory on the final 2012 NPDES Permit Re-Application.

3.3 Geological Setting

The Laboratory is located in northern New Mexico on the Pajarito Plateau, which is formed of volcanic tuff (welded volcanic ash) deposited by past volcanic eruptions from the Jemez Mountains to the west (see Figure 3.3). The geology of the LANL region is the result of complex faulting, sedimentation, volcanism, and erosion over the past 20 to 25 million years (DOE, 1999). The Jemez Mountains are a broad highland built up over the last 13 million years through volcanic activity. Late in the volcanic period, cataclysmic eruptions from calderas in the central part of the Jemez Mountains deposited the thick blankets of tuff that form the Pajarito Plateau (Broxton and Vaniman, 2004). Volcanic activity culminated with the eruption of the rhyolitic Bandelier Tuff from 1.6 to 1.22 million years ago. During emplacement, intense heat and hot volcanic gases welded portions of these tuffs into the hard, resistant deposits that make up the upper surface of the plateau. Most of the bedrock on LANL property is composed of the salmon-colored Bandelier Tuff (DOE, 1999).



Notes:
1. The thickness of geologic units has been exaggerated on this figure to illustrate unit relationships and topography.
2. Offset of the Tschicoma formation on the Pajarito Fault zone is schematic due to the variation along the trace of the fault.
3. To convert feet to meters, multiply by 0.3048.

Source: LANL 2005h

Figure 3.3 - Generalized Cross-Section of the Los Alamos National Laboratory Area

3.4 Climate

The Los Alamos area has a temperate, semiarid mountain climate. Large differences in locally observed temperature and precipitation exist because of the 1,000-ft elevation change across the Laboratory site and the complex topography. Four distinct seasons occur in Los Alamos County. Winters are generally mild, with occasional winter storms. Spring is the windiest season. Summer is the rainy season, with occasional afternoon thunderstorms. Fall is typically dry, cool, and calm. Daily temperatures are highly variable (a 23°F range on average). On average, winter temperatures range from 30°F to 50°F during the daytime and from 15°F to 25°F during the nighttime. The Sangre de Cristo mountains to the east of the Rio Grande Valley act as a barrier to wintertime arctic air masses that descend into the central United States, making the occurrence of local subzero temperatures rare. On average, summer temperatures range from 70°F to 88°F during the daytime and from 50°F to 59°F during the nighttime. From 1981 to 2010, the average annual precipitation (which includes both rain and the water equivalent of frozen precipitation) was 18.95 inches and the average annual snowfall amount was 58.7 inches The months of July and August account for 36% of the annual precipitation and encompass the bulk of the rainy season, which typically begins in early July and ends in early September. Afternoon thunderstorms yield short, heavy downpours and an abundance of lightning. Local lightning density, among the highest in the United States, is estimated at 15 strikes per square mile per year. Lightning is most commonly observed between May and September (about 97% of the local lightning activity).

3.5 Hydrologic Setting

The Laboratory property contains parts or all of seven primary watersheds that drain directly into the Rio Grande, each defined by a master canyon (Los Alamos, Sandia, Mortandad, Pajarito, Water, Ancho, and Chaquehui) as shown on Figure 3.4. Each of these watersheds includes tributary canyons of various sizes. Los Alamos, Pajarito, and Water Canyons have their headwaters west of the Laboratory in the eastern Jemez Mountains (the Sierra de los Valles), mostly within the Santa Fe National Forest, while the remainder head on the Pajarito Plateau. Only the Ancho Canyon watershed is entirely located on Laboratory land. Canyons that drain Laboratory property are dry for most of the year, and no perennial surface water (i.e., water that is present all year) extends completely across Laboratory land in any canyon. Approximately three miles of canyon in the western part of the Laboratory have streams that are naturally perennial and fed by springs. These perennial segments are located in Water Canyon, Canon de Valle (a major tributary to Water Canyon), and Pajarito Canyon and its tributaries. Approximately four miles of canyon on Laboratory land have perennial streams created by discharges of sanitary effluent from the wastewater treatment plants in Pueblo and Sandia Canyons. Spring-fed perennial stream segments are also located in lower Ancho and Chaquehui Canyons on Laboratory land near the Rio Grande, as well as in other canyons upstream and downstream from the Laboratory.

The remaining stream channels are dry for varying lengths of time. The driest segments flow only after local precipitation events or during snowmelt periods, and flow in these streams is ephemeral. Other stream segments sometimes have alluvial groundwater that discharges into the stream bed and/or experience extensive snowmelt runoff and are considered intermittent. Intermittent streams may flow for several weeks to a year or longer.

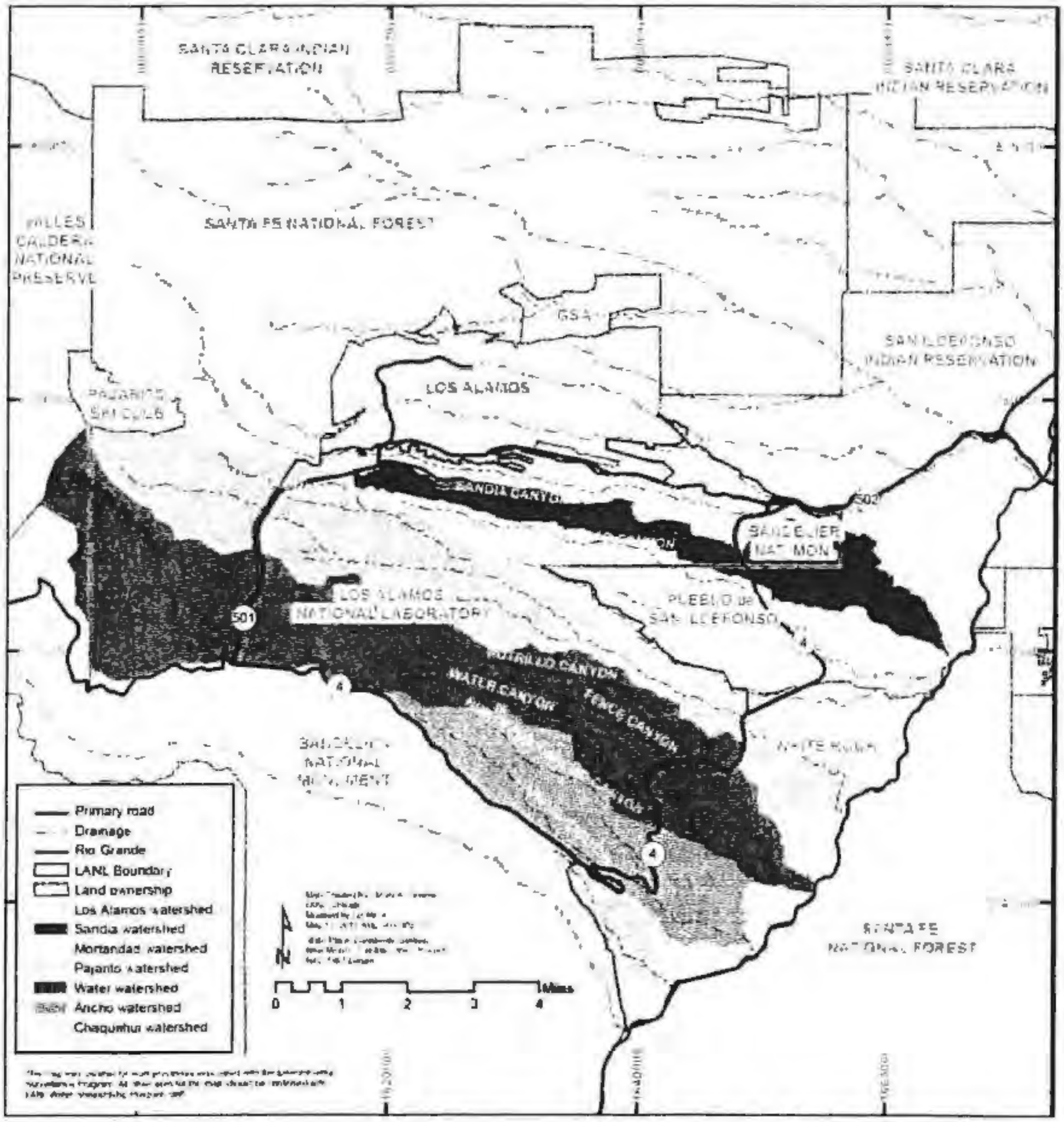


Figure 3.4 - Primary Watersheds at Los Alamos National Laboratory

To aid in water quality interpretation, we consider three basic types of stream flow. At times, the flow might represent a combination of several of these flow types:

- **Base flow**—persistent stream flow but not necessarily perennial water. This type of flow is generally present for periods of weeks or longer. The water source may be springs, effluent discharge, or alluvial groundwater that emerges along stream beds.

- **Snowmelt runoff**—flowing water present because of melting snow. This type of water may be present for up to a month or more and in some years may not be present at all.

- **Storm water runoff**—flowing water present in response to rainfall. These flow events are generally very short-lived, with flows lasting from less than an hour to—rarely—several days. Base flow and snowmelt runoff can be present for extended periods of time. Storm water runoff may provide a short-term water source for wildlife, particularly when it collects in bedrock pools or other local depressions, and water quality will improve at these locations over time as the suspended sediment settles out. Storm water is capable of transporting sediment off site.

Except during major runoff events, the cumulative flow of wastewater discharges does not reach the Rio Grande. The intermittent runoff leaving Laboratory property is measured at gage stations located in each watershed. These flow measurements are periodically published in the Watershed Periodic Monitoring Reports or in reports for a given water year. Appendix F provides the Surface Water Data report for Water Year 2009. Appendix G provides a scaled full size map showing the location of the springs/baseflow associated with each watershed and the locations of the outfalls associated with this re-application document.

3.6 Groundwater Occurrence

The Laboratory is located on top of a thick zone of mainly unsaturated rock, with the primary aquifer found 600 - 1,200 ft below the ground surface. Groundwater occurs beneath the Pajarito Plateau in three modes: (1) perched alluvial groundwater in canyon bottoms; (2) zones of intermediate-depth perched groundwater whose location is controlled by availability of recharge and by subsurface changes in permeability; and (3) the regional aquifer beneath the Pajarito Plateau as shown on Figure 3.5.

Stream runoff may be supplemented or maintained by Laboratory discharges. Many relatively dry canyons have little surface water flow and little or no alluvial groundwater. Streams have filled some parts of canyon bottoms with alluvium up to a thickness of 100 ft. In wet canyons, stream runoff percolates through the alluvium until downward flow is impeded by less permeable layers, maintaining shallow bodies of perched groundwater within the alluvium. Contaminant distributions in the groundwater under the Pajarito Plateau suggest that the three systems may be in communication under certain conditions (Robinson, McLin, and Viswanathan, 2005). The hydrogeology of the Pajarito Plateau is typical of the semi-arid, sediment-filled basins along the Rio Grande Rift in that the basins receive recharge from mountain ranges along the margins (Broxton and Vaniman, 2005). The following bullets briefly discuss alluvial, perched, and regional groundwater:

- **Alluvial Groundwater:** Alluvial groundwater primarily occurs in canyons that originate in the Sierra de los Valles or in the Pajarito Plateau watersheds. Groundwater in the canyons is supported by seasonal runoff from the mountains, by episodic precipitation events on the plateau, perennial springs, and by discharge from LANL outfalls. The wastewater also plays a part in the hydrogeology of the canyons.

- **Deep Perched Groundwater:** Perched water is defined "as a hydrologic condition in the rock or sediment above the regional aquifer in which the rock pores are completely saturated with water." Perched water bodies are important elements of the hydrogeology of the site for several reasons. There is a probability that the zones can intercept contaminants being transported downward through the vadose zone. The perched water can be a permanent or long-term residence for contaminants because the chemical makeup of the rocks may result in adsorption. Perched water can also serve as a place where dilution occurs, lowering the concentration of contaminants. There is a possibility that perched zones may be intersected by streams in the lower parts of the canyons, resulting in lateral flow under the influence of gravity out of the canyon walls into the alluvial aquifer and subsequently to the Rio Grande.

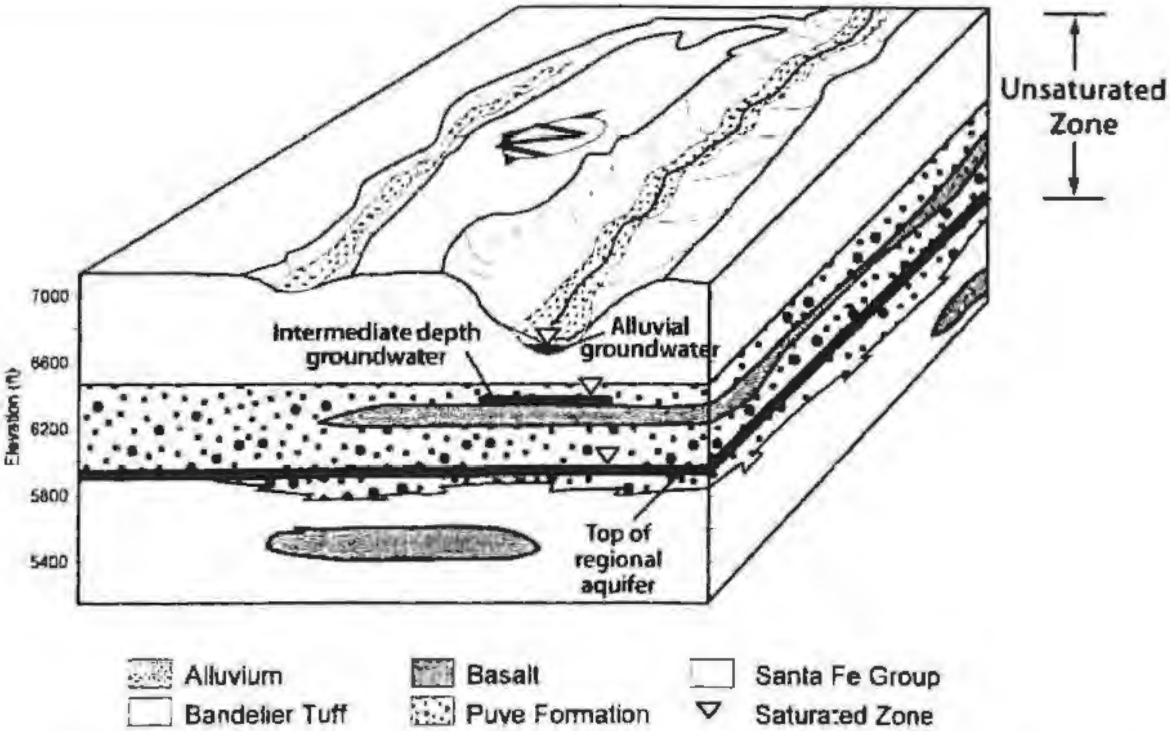


Figure 3.5 – Illustration of Geological and Hydrological Relationships on the Pajarito Plateau

- **Regional Groundwater:** The regional aquifer located below LANL is very deep (up to 1,200 feet [360 meters]) and is separated from the surface by a thick vadose zone with some perched water zones (Keating, Robinson, and Vesselinov, 2005). The depth to the water of the regional aquifer on the eastern part of the plateau near the rim of White Rock Canyon is about 614 feet (200 meters), about 210 feet (65 meters) above the level of the Rio Grande (Broxton and Vaniman, 2005). It has been reported that a well drilled in the lower Los Alamos Canyon near the Rio Grande flowed to the surface when installed in the regional aquifer, indicating confined or semi-confined conditions, and that there are seeps and springs in White Rock Canyon (Broxton and Vaniman, 2005).

The Laboratory uses groundwater for its potable water supply to laboratory facilities, sanitary facilities, and operations support facilities (cooling towers, power plant etc.). This groundwater contains various levels of natural elements that are dissolved as the water passes through the sub-surface geology. Appendix H provides the sampling results for well water as collected by the Los Alamos County Safe Drinking Water Act Sampling Program for 2010.

3.7 Soil Conditions

Most of the Laboratory facilities are located on mesa tops, where the soils are generally well-drained and thin. The parent materials are approximately 95% Bandelier Tuff, volcanic rocks of the tschicoma and Puye Formations, and the Cerros de Rio Basalts of the Chino Mesa, and the remnants of the El Cajete pumice. The remaining 5% was formed from colluviums, alluvium, andesitic rocks of the Paliza Canyon Formation, Cerro Rubio Quartz Latites, and tuffs associated with the sediments of the Cerro Toledo Rhyolite. The textures of the these soils range from very fine sandy loams and clay loams to gravelly, sandy loams and stony, silty clay loams.

3.8 Wild Fires - Cerro Grande and Las Conches

There have been two major forest fires in the vicinity of the Laboratory over the last 10 years. In May 2000, the Cerro Grande Fire burned approximately 47,000 acres, including about 7,700 acres of Laboratory lands (Balice, Bennett, and Wright, 2004). This fire severely burned much of the mountainside that drains onto the Laboratory (Gallaher and Koch, 2004). On June 26, 2011 a second major forest fire started due to an aspen tree collapsing a power line. The Las Conchas Fire burned 156,000 acres surrounding the Laboratory and the Los Alamos town site. Most of the fire burned on the Bandelier National Monument, Pueblo Land, and the Valle Caldera Preserve. It did include, however, a 2 acre spot fire on Laboratory property along the south boundary of TA-49. An additional 90 acres of Laboratory property were also burned due to fire-fighting efforts that included back burns west of State Road 501. In general, the effects of both fires included increased soil erosion due to loss of vegetative cover, formation of hydrophobic soils, and soil disturbance during construction of fire breaks, access roads, and staging areas used to support the fire-fighting efforts.

4.0 OUTFALL DESCRIPTIONS AND CLASSIFICATIONS

This 2012 NPDES Permit Re-Application Package includes 11 outfalls located at seven (7) Technical Areas (TAs) spread out over approximately a 40 square mile area within the Laboratory boundaries as shown in Table 4.1 and the map provided as Appendix G. These outfalls discharge into 4 of the watersheds in the LANL region, with the amount of discharge varying from year to year. Detailed treatment descriptions and future proposed changes to NPDES permitted facilities and outfalls are found in the EPA Form 2C Applications and Fact Sheets for each outfall.

Table 4.1
National Pollutant Discharge Elimination System Industrial Point Source Outfalls

No. Outfall	Outfall Category	ID No.	Location/ Facility	Watershed
1	Power Plant/SERF Discharge (001)	001	TA-3-22	Sandia
1	Sanitary Waste Water Treatment (13S)	13S	TA-46-347	Canada del Buey*
1	Radioactive Liquid Waste Treatment (051)	051	TA-50-1	Mortandad
7	Treated Cooling Water (03A)	03A022	TA-3-66	Mortandad
		03A027	TA-3-2327	Sandia
		03A048	TA-53-964, 979	Los Alamos
		03A113	TA-53-293, 952	Sandia
		03A160	TA-35-124	Mortandad
		03A181	TA-55-6	Mortandad
		03A199	TA-3-1837	Sandia
1	High Explosive Waste Water Treatment (05A)	05A055	TA-16-1508	Water/CdV

*Treated effluent from Outfall 13S is pumped to the TA-3 Re-Use tank, thence Outfall 001. The TA-46 SWWS Plant has never discharged into Canada del Buey. Canada del Buey is a tributary to Mortandad Canyon.

5.0 WASTE ACCEPTANCE, CHARACTERIZATION, AND CERTIFICATION PROGRAM

The Laboratory's waste management requirements are consistent with the applicable DOE orders, and state and federal regulations. All waste generators at the Laboratory are required to properly identify and document the characterization of any solid, hazardous, radioactive, or mixed waste pursuant to P409, *Waste Management* (Appendix M). This includes compliance with the appropriate facility Waste Acceptance Criteria (WAC) and the preparation of a Waste Profile Form (WPF).

The Laboratory has ten recycling, waste storage, treatment, and disposal paths with specific WACs provided as attachments to P930-1, LANL Waste Acceptance Criteria. The following P930-1 attachments (Appendix N) are applicable to this 2012 NPDES Permit Re-Application:

- Attachment 16, P930-1: SWWS WAC
- Attachment 1, P930-1: RLWTF WAC

P930-1 does not include the WAC for some small specialty waste streams generated at the Laboratory. These waste streams have a site/facility specific WAC. The following site/facility specific WACs (Appendix N) are applicable to this 2012 NPDES Permit Re-Application:

- EP-RLW-AP-2902, Waste Acceptance Criteria for Transuranic (TRU) Radioactive Liquid Waste (RLWTF TRU WAC)
- LA-UR-08-1520, TA-16 Waste Acceptance Criteria (HEWTF WAC)

The WACs for the wastewater treatment facilities that may discharge to an NPDES permitted outfall are based on the NPDES effluent limits, New Mexico Water Quality Standards, RCRA Universal Treatment Standards, and/or other federal and state requirements. The treatment processes and capacities of these facilities are also considered during the development of the WACs.

The Laboratory utilizes the WPF to provide a complete and concise description of each waste stream including the details of the generating process. The WPF process provides generators with guidance to help make the determination of the physical, chemical, and radiological characteristics of the waste with sufficient accuracy to permit proper segregation, treatment, and disposal appropriate facility WAC. A WPF is required for all waste streams to be discharged or transported to the SWWS, RLWTF, and/or HEWTF. They are typically prepared by the generator with the assistance of a Waste Management Coordinator (WMC) who then enters the WPF information into the Waste Compliance and Tracking System (WCATS). The WCATS system automatically routes the WPF for approval by the appropriate organizations/personnel and allows for the generator to attach characterization data, acceptable knowledge data and other information necessary to properly document the waste stream. The WMCs serve as the primary contact between the waste generator and the treatment/disposal facility and are generally responsible for ensuring the following:

- Wastewater discharged/transported to the SWWS, RLWTF, or HEWTF is acceptable under the current NPDES Permit requirements.

- Operating personnel are familiar with the pertinent administrative requirements and waste management regulations.

- Wastewater discharged/transported to the SWWS, RLWTF, or HEWTF meets the requirements of the respective WAC for each facility.

- RCRA-Listed hazardous wastewater is not discharged/transported to the SWWS, RWLTF, or HEWTF.

- The operations personnel at the SWWS, RLWTF, or HEWTF are notified of any unusual or accident discharge that may violate the waste management requirements/regulations.

6.0 2012 NPDES RE-APPLICATION PROJECT

The data and information used to prepare this 2012 NPDES Permit Re-Application document was prepared by a project team that consisted of representatives from DOE, ENV-RCRA, Outfall owners, and Facility Operations Directors/Managers. The project team responsibilities and activities were outlined in a project Implementation Plan (Appendix O). The following sections provide a brief discussion of the work activities and the procedures and processes that were utilized by personnel to ensure that the information provided in this re-application document is complete and accurate.

6.1 Outfall Survey

The purpose of the outfall survey was to accumulate records, logs, operating procedures, sampling data, compliance inspection reports, topography maps, chemical inventories, WPFs, MSDSs, Notice of Change/Plans to Change, and previous Laboratory discharge non-compliance records and reports to support completion of the Form 2C for each outfall. The outfall survey included site visits to each of the 11 outfalls and their associated treatment facilities to take photographs, provide confirmation of the sources and processes, verify the outfall location, and collect documentation. The site visits were conducted in accordance with ENV-RCRA-QP-037, *Performing NPDES Reapplication Surveys.*

6.2 Outfall Effluent Sampling and Analysis

The Permittees prepared a project specific Sampling and Analysis Plan (SAP) (Appendix P) to ensure that representative samples were collected, preserved, and managed in accordance with the EPA application Form 2C. All samples were collected in accordance with the project specific SAP, ENV-RCRA-IWD-005, *NPDES Outfall Compliance Sampling; and* ENV-RCRA-QP-005, *Sampling at NPDES Permitted Outfalls.* The samples were shipped by the Sample Management Office (SMO) to a LANL approved analytical laboratory required to use EPA approved methods and follow DOE contract requirements. The analytical laboratory was also required to provide Level 4 Quality Data Packages.

All analytical data, upon receipt from the laboratory, was formally validated by an independent subcontractor prior to its use in the re-application (Level 4). After the data was validated it was forwarded to ENV-RCRA from the Sample Management Office (SMO) and hand entered onto the Form 2C. The accuracy of the hand entered data was independently verified and the review documented, forwarded to the appropriate record series, and a hard copy sent to ENV-RCRA.

6.3 Document Control/Records Management

Effective document control, record keeping, and data management was conducted in accordance with ENV-DO-QP-106, *Document Control*; ENV-DO-QP-110, *Records Management*; and ENV-DO-POL-QAP, *ENV Quality Assurance Plan.*

6.4 Quality Assurance

The quality assurance for the project was performed in accordance with SD330, *Los Alamos National Laboratory Quality Assurance Program;* ENV-DO-POL-QAP, *ENV Quality Assurance Plan;* and ENV-RCRA-QAPP-NPDES IPSP, *Quality Assurance Project Plan for the NPDES Industrial Point Source Permit (IPSP) Self-Monitoring Program.* Quality assurance reviews for data accuracy were conducted throughout the project to ensure that data collected from the outfall surveys, site visits, and sampling activities were reasonable and adequately documented. These QA reviews were initially be conducted by project personnel as the data was collected and/or received. Questionable or undocumented data initiated additional investigations with outfall owners/operators. To ensure accuracy, all collected or compiled data was compared and evaluated against existing data obtained from other internal and external entities.

Formal reviews were also conducted by subject matter experts, the outfall owners; and the quality assurance specialist assigned to ENV-RCRA. These included formal comment review and response to ensure that all changes were documented.

7.0 NPDES PERMIT RE-APPLICATION FORMS

The NPDES Permit Re-application requires detailed information be provided for each point source outfall. The information required includes the location of the outfall, a detailed description of all sources and processes that contribute to the discharged waste stream, the volume and frequency of the discharge, and analytical data on the waste stream. A "fact sheet" which provides a brief biography of the required information has be created and provided for each Form 2C for each of the 11 outfalls included in the reapplication.

7.1 General Form 1

Form 1 is used to present general information such as the nature of business, name, mailing address, location, and existing permit numbers regarding EPA programs that apply to LANL. The information in the General Form 1 of the 2012 re-application did not vary significantly from that which was provided in the 2004 NPDES Re-Application. The following bullets summarize the deviations and/or considerations (if any) that are applicable to this 2012 NPDES Permit Re-Application:

- EPA deleted four (4) NPDES Outfalls (02A129, 03A021, 03A130 and 03A185) from the DOE/LANS permit on October 11, 2011. Additional outfalls are being evaluated for elimination.
- Appendix G provides a topographic map showing the locations of the 11 Outfalls to be permitted with respect to the Springs located in the area around the Laboratory.
- Appendix I provides a topographic map showing the sanitary waste collection system that delivers wastewater to the SWWS for treatment
- Appendix J provides a topographic map showing the RLWCS that delivers wastewater to the RLWTF for treatment.

Attachment Form 1 provides the completed General Form 1 with its associated footnotes and certifications.

7.2 Standard Form A

Standard Form A is the section of the application used for documenting discharges from a publicly or privately owned activity or wastewater treatment system or facility. The Laboratory does not own or operate a municipal wastewater system or publically owned treatment works. Communication with the EPA Region 6 Permit Writer in May 2011 indicated that the applicant would not be required to submit a Standard Form A with the submitted permit re-application package.

7.3 Form 2C

The Form 2 C is the section of the application used for renewal of expiring NPDES industrial permits. It provides detailed information regarding the location of the outfall, sources of influent water, production levels, and the analytical data for potential contaminants in the effluent discharged from the outfall. The Form 2C for each outfall is as an attachment to this permit re-application that corresponds to the respective outfall ID number. In addition to the Form 2C, the applicant has provided supporting documentation for each of the 11 outfalls. This supporting documentation includes:

- Fact Sheet
- Outfall Summary Discharge Monitoring Report
- Process Flow Diagram
- Outfall Location Map

8.0 REFERENCES

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ENV-RCRA-QAPP-NPDES IPSP, *Quality Assurance Project Plan for the NPDES Industrial Point Source Permit (IPSP) Self-Monitoring Program*

ENV-DO-QP-106, *Document Control*

ENV-DO-QP-110, *Records Management*

ENV-DO-POL-QAP, *ENV Quality Assurance Plan*

ENV-RCRA-IWD-005, *NPDES Outfall Compliance Sampling*

ENV-RCRA-QP-005, *Sampling at NPDES Permitted Outfalls*

ENV-RCRA-QP-037, *Performing NPDES Reapplication Surveys*

NPDES Permit No. NM0028355, effective August 1, 2007

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SD330, *Los Alamos National Laboratory Quality Assurance Program*

Please print or type in the unshaded areas only.

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL | EPA | U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F	NM0890010515		D

LABEL ITEMS	
I. EPA I.D. NUMBER	PLEASE PLACE LABEL IN THIS SPACE
III. FACILITY NAME	
V. FACILITY MAILING ADDRESS	
VI. FACILITY LOCATION	

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if 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	YES	NO	FORM ATTACHED
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		X
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	X		
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP LOS ALAMOS NATIONAL LABORATORY

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
TURNER, GENE, Environmental Permitting Manager	(505) 667-5794

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

U.S. DOE LOS ALAMOS SITE OFFICE

B. CITY OR TOWN	C. STATE	D. ZIP CODE
LOS ALAMOS	NM	87544

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

3747 WEST JEMEZ ROAD

B. COUNTY NAME

LOS ALAMOS

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
LOS ALAMOS	NM	87544	NA

EPA Form 3510-1 (8-90)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

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

A. FIRST	7 9711	(specify) NATIONAL SECURITY
B. SECOND	7 9661	(specify) SPACE RESEARCH & TECHNOLOGY
C. THIRD	7 9922	(specify) SCIENTIFIC RESEARCH
D. FOURTH	7 9611	(specify) ENERGY DEVELOPMENT

VIII. OPERATOR INFORMATION

A. NAME: 8 LOS ALAMOS NATIONAL SECURITY

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

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box. if "Other," specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

P (specify)

D. PHONE (area code & no.): A (505) 667-4218

E. STREET OR P.O. BOX: P.O. BOX 1663

F. CITY OR TOWN: B LOS ALAMOS

G. STATE: NM

H. ZIP CODE: 87544

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

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	9 N	NM0028355
B. UIC (Underground Injection of Fluids)	9 U	NA
C. RCRA (Hazardous Wastes)	9 R	NM0890010515-1 (A)
D. PSD (Air Emissions from Proposed Sources)	9 P	P100R1 (See Footnote B)
E. OTHER (specify)	9	(See Footnotes C - G) (specify) NPDES Construction General Permit; NPDES Individual Permit; & NPDES Multisector General Permit; Septic Tank Permits; Groundwater Discharge Permits
E. OTHER (specify)	9	(See Footnote H) (specify) Dredge and Fill Permits

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 Los Alamos Ntaional Laboratory is a multidisciplinary/multiprogram laboratory. The Laboratory's central mission is to reduce the nuclear danger through evaluation and stockpile stewardship. It also provides significant programmatic support to many civilian efforts. Because of evolving technolgies and changing national and international priorities, the Laboratory increasingly uses its multidisciplinary research and development capabilities to solve civilian problems in the areas of health, national infrastructure, energy, education, aeronautics, and the environment. Extensive basic research programs in physics, chemistry, metallurgy, mathematics and computers, earth sciences, and electronics support these efforts.

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
Kevin W. Smith, Manager, DOE/Los Alamos Site Office	K W S	1/27/2012

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (8-90)

CONTINUED FROM THE FRONT

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

A. FIRST	B. SECOND
7 (specify)	7 9661 (specify)
C. THIRD	**D. FOURTH**
7 (specify)	7 9611 (specify)

VIII. OPERATOR INFORMATION

A. NAME 8

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

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other," specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

(specify)

D. PHONE (area code & no.) A

E. STREET OR P.O. BOX

F. CITY OR TOWN B

G. STATE

H. ZIP CODE

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water) 9 N	D. PSD (Air Emissions from Proposed Sources) 9 P
B. UIC (Underground Injection of Fluids) 9 U	E. OTHER (specify) 9 (specify)
C. RCRA (Hazardous Wastes) 9 R	E. OTHER (specify) 9 (specify)

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)

EXTRA PAGE FOR SIGNATURE

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
Alison M. Dorries, Division Leader, Environmental Protection Division	[signature]	1/27/12

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (8-90)

Form 1
General Footnotes

A **NM0890010515-1 Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit:** The RCRA permit regulates the management of hazardous wastes based on a combination of the facility's status, the quantities of waste generated, and the types of waste management conducted by the facility. The Laboratory's hazardous waste facility permit was initially granted in 1989 for storage and treatment operations. The current RCRA Hazardous Waste Permit became effective on December 30, 2010. Appendix D provides maps of the Hazardous Waste Management Facilities and a listing of the Hazardous Waste Treatment Process Codes.

B **P100R1 Air Quality Operating Permit:** The Federal Clean Air Act Operating Permit provides the terms and conditions that must be followed in order to operate applicable air emission sources (i.e., boilers, electric generators, power plant, a combustion turbine generator, a data disintegrator, two carpenter shops, a degreaser, and an asphalt plant) at the Laboratory. The Laboratory also reports emissions from chemical use associated with R&D and permitted beryllium activities. The current Air Quality Operating Permit became effective on August 7, 2009.

C **NPDES Construction General Permit**: The Construction General Permit (CGP) regulates storm water discharges from construction activities disturbing one or more acres, including those construction activities that are part of a larger common plan of development collectively disturbing one or more acres. The Laboratory and the general contractor apply individually for NPDES CGP coverage and are co-permittees at most construction sites. Compliance with the NPDES CGP includes developing and implementing a Storm Water Pollution Prevention Plan before soil disturbance can begin and conducting site inspections once soil disturbance has commenced. There are currently 16 Active Construction General Permit Notice of Intent documents at LANL (Appendix C).

D **NPDES Permit No. NM0030759 - Industrial Point Source Permit:** The Individual Permit (IP) authorizes the discharge of storm water associated with industrial activities at the Laboratory from specified solid waste management units (SWMUs) and areas of concern (AOCs). It contains non-numeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program, to minimize pollutants in storm water discharges. It requires the Laboratory to implement site-specific control measures (including best management practices) to address the non-numeric technology-based effluent limits as necessary to minimize pollutants in their storm water discharges. The current NPDES IP Permit, incorporating the latest modifications, became effective on November 1, 2010.

E **NPDES Storm water Multi-Section General Permit (MSGP):** The NPDES Industrial Storm Water Permit Program regulates storm water discharges from identified regulated industrial activities and their associated facilities. These activities include metal fabrication; hazardous waste treatment and storage; vehicle and equipment maintenance; recycling activities; electricity generation; warehousing activities; and asphalt manufacturing. LANS and the DOE are co-permittees under the EPA 2008 NPDES Storm Water MSGP for Industrial Activities (MSGP-2008). The current MSGP was effective September 29, 2008.

F **Septic Tank Permits:** LANL is responsible for requesting septic tank permits and creating and maintaining septic tank designs and installation to comply with the NMED Liquid Waste Disposal Program. Appendix C provides a list of the current septic tank permits at the Laboratory.

2012 NPDES PERMIT RE-APPLICATION
OUTFALL FACT SHEET

Outfall ID No.	Outfall Location	Outfall Category	Receiving Stream
051	TA-50-1	Radioactive Liquid Waste Treatment Facility (RLWTF)	Effluent Canyon, a Tributary to Mortandad Canyon

SOURCE OF DISCHARGE

Outfall 051 is located at TA-50 and discharges treated radioactive liquid wastewater effluent from the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50-1 into Effluent Canyon, a tributary of Mortandad Canyon. Table 1 identifies the location of the RLWTF and provides a description of influent sources that it receives.

Table 1
Sources for Discharge to Outfall 051

TA	Bldg	Description
50	1	Radioactive Liquid Waste Treatment Facility - Process water from radiochemistry laboratories, duct washing systems, radiological areas, boilers, and process areas. - Cooling water from systems located in radiological areas. - Storm and surface water (including samples) collected from sumps, manholes, and vaults. - Environmental Restoration (ER) waste water generated by groundwater monitoring and sampling activities at performed at LANL.

Figure 1 provides a process flow diagram for the RLWTF.

WATER TREATMENT PROCESS

The RLWTF treats low-level and transuranic (TRU) radioactive liquid wastewater delivered from processes at various generator facilities to TA-50 by underground collection system or by tanker truck. All wastewater discharged into the RLWTF must comply with the facility's Waste Acceptance Criteria and must have a completed/approved Waste Profile Form (Appendix N). The NPDES sample point for this outfall allows for the collection of a sample after the final treatment process. The RLWTF includes two different treatment processes as follows:

- **Low-Level Radioactive Liquid Waste (RLW) Treatment Process** - Low-level influent is received at the facility through the Radioactive Liquid Waste Collection System (see Appendix J, K) where it is routed through a pH adjustment chamber and collected in the influent tanks. RLW is fed from the influent tanks to the clarifiers where it is treated by chemical precipitation and flocculation (sodium hydroxide, magnesium hydroxide, ferric chloride, sulfate, or other chemicals) to remove silica and radionuclides. The clarified water is drawn off and filtered. The RLW may then be treated by ion exchange or is sent to a Reverse Osmosis (RO) unit. The RO permeate (treated water) is routed to effluent storage tanks prior to being discharged to the effluent evaporator, TA-52 solar evaporation tanks (anticipated to be operational within the next 5 years), or the NPDES outfall. If the effluent is to be discharged to Outfall 051 it is further treated with ion exchange to remove copper/zinc and may have magnesium/calcium salts added to adjust the hardness prior to discharge. Secondary waste treatment processes are also included for RO concentrate (Secondary RO) and sludge (vacuum filter/dewatering). These processes result in recycle streams back to the influent tanks and to other process units, and concentrated and solid waste streams shipped as low-level radioactive waste.

- **TRU RLW Treatment Process -** TRU RLW is received at the facility through an underground, doubled walled pipe collection system from TA-55 (see Appendix J, K) and is collected at the TA-50-66 influent tanks. The TRU influent is routed from TA-50-66 to the treatment tank in Room 60 where it is treated by chemical precipitation (sodium hydroxide) to remove radionuclides. Solids from the tank are collected in a sludge tank, allowed to settle, and are then solidified with cement in a drum tumbler. The cement drums are shipped and disposed of as TRU waste. The treated water is routed to the low-level treatment plant for either additional treatment or for storage pending shipment off-site for LLW disposal.

The water treatment codes provided in Table 2 have been assigned to this outfall.

Table 2
Water Treatment Codes Assigned to the RLWTF and Outfall 051

Treatment Code	Treatment Process	Description
1F	Evaporation	Waste Reduction Evaporator, Mechanical Evaporator, and/or Solar Evaporation Tanks
1G	Flocculation	Clarifiers
1O	Mixing	Various
1S	Reverse Osmosis (Hyperfiltration)	RO Units
1U	Sedimentation (Settling)	Sludge
1Q	Multimedia Filtration	Pressure and Cartridge Filters used for Particulate Removal
1R	Rapid Sand Filtration	Gravity Media Filter for Particulate Removal
2C	Chemical Precipitation	Sodium hydroxide, magnesium hydroxide, magnesium sulfate, sodium aluminate, co-polymer, and ferric sulfate are used to promote precipitation of radionuclides and silica removal
2G	Coagulation	Clarifiers
2J	Ion Exchange	Perchlorate, copper, and zinc removal
2K	Neutralization	Influent and Room 60 Neutralization
5Q	Landfill	Drums of TRU and LLW Waste
5U	Vacuum Filtration	Vacuum filter for LLW sludge

TREATMENT CHEMICALS AND POTENTIAL CONTAMINANTS

The water treatment processes identified in Table 2 utilize chemicals to control pH, promote precipitation, and flocculation. Table 3 identifies the treatment chemicals that are used at the RLWTF.

Table 3
Treatment Chemicals Used at the RLWTF

Source	Reason for Use/Frequency	Hazardous Substances from Form 2C, Table 2C-4
Sodium Hydroxide 25%	pH Adjustment, Promote Precipitation/Flocculation, and Membrane Cleaning	Sodium Hydroxide
Ferric Sulfate	Promote Precipitation/Flocculation	Ferric Sulfate
Magnesium Hydroxide	Promote Precipitation/Flocculation	NA
Carbon Dioxide	Adjust pH	NA
Magnesium Sulfate	Precipitation/Flocculation	NA

Table 3 (continued)
Treatment Chemicals Used at the RLWTF

Source	Reason for Use/Frequency	Hazardous Substances from Form 2C, Table 2C-4
EDTA	Membrane Cleaning	EDTA
Sodium bisulfite	Membrane Cleaning	Sodium Bisulfite
Dishwashing Soap	Membrane Cleaning	NA
Ionac SR-6	Ion Exchange Resin	NA
Hydrochloric Acid	Reduce pH	Hydrochloric Acid
Solid Sodium Hydroxide	Precipitation/Flocculation	Sodium Hydroxide
SCU	Ion Exchange Media	NA
SCP	Ion Exchange Media	NA
Sodium Aluminate	Precipitation/Flocculation	NA
WEST W-126	Ionic Co-polymer used as a Flocculent	2-Propanoic Acid

Table 4 identifies the contaminants listed on the Waste Profile Forms for the influent waste streams received by the RLWTF for treatment.

Table 4
Potential Contaminants Associated with the RLWTF Influent

Waste Stream Type	Description	Hazardous Substances from Form 2C, Table 2C-4 Identified on WPFs[1]		Detected in Outfall 051 Discharge (Aug 07 – Jun 10)
Process	Discharged from laboratories, radiological areas and process areas.	acetic acid ammonia ammonium bifluoride ammonium carbonate ammonium chloride ammonium fluoride ammonium hydroxide benzene chloroform chromic acid cupric chloride cupric sulfate endrin EDTA ferric chloride ferric nitrate ferric sulfate ferrous ammonium sulfate ferrous chloride ferrous sulfate formaldehyde formic acid	heptachlor hydrochloric acid hydrofluoric acid lead nitrate nitric acid phenol phosphoric acid potassium dichromate potassium hydroxide potassium permanganate sodium dodecylbenzenesulfonate sodium fluoride sodium hydroxide sodium hypochlorite sodium nitrite sodium phosphate (dibasic) sulfuric acid uranyl nitrate zinc chloride zinc nitrate zinc sulfate	Chloroform [2] Chromium [3] Copper [4] Lead [5]
ER	Discharged from groundwater drilling and remediation projects.	acrolein ammonia aniline benzoic acid Dieldrin endosulfan	endrin ethyl benzene Naphthalene Phenol Toluene xylene	Naphthalene [6] Phenol [7]

Table 4 (continued)
Potential Contaminants Associated with the RLWTF Influent

Waste Stream Type	Description	Hazardous Substances from Form 2C, Table 2C-4 Identified on WPFs[1]		Detected in Outfall 051 Discharge (Aug 07 – Jun 10)
Storm Water	Discharged from sumps, manholes, and vaults.[8, 9]	Ammonia chloroform	nitric acid trichloroethylene	Chloroform[2]

1. NOTE: The wastewater influent received by the RLWTF is not Resource Conservation and Recovery Act (RCRA) listed hazardous waste.
2. Chloroform was detected twelve (12) times at concentrations ranging from 0.000283 – 0.0546 mg/L.
3. Chromium was detected one (1) time at a concentration of 0.001 mg/L.
4. Copper was detected thirty five (35) times at concentrations ranging from 0.0102 – 0.24 mg/L.
5. Lead was detected on (1) time at a concentration of 0.0076 mg/L.
6. Naphthalene was detected two (2) times at concentrations of 0.000372 – 0.000933 mg/L.
7. Phenol was detected on (1) time at a concentration of 0.0177 mg/L.
8. Ammonia, chloroform, and trichloroethylene were detected in storm water collected from TRU Low Level Waste (LLW) storage dome sumps located at TA-54 and sent to the RLWTF for treatment. These detections are likely due to residual cleaning chemicals and/or the presence of asphalt.
9. The nitric acid is used as a preservation chemical for storm water and surface water samples that are managed at TA-59. Unused sample material is poured down the RLW drain to the collection system.

POTENTIAL POLLUTANTS

The treatment chemicals and treated RLWTF effluent constitute the pollutant load that could potential discharge to Outfall 051. Table 5 identifies the Table 2C-4 constituents that will potentially be discharged to the outfall.

Table 5
Potential Pollutants Discharged to Outfall 051

Description	Hazardous Substances Required to be Listed on the NPDES Permit Application Form 2C		
TA-50 RLWTF Treated Effluent, Outfall 051	acetic acid acrolein ammonia ammonium bifluoride ammonium carbonate ammonium chloride ammonium fluoride ammonium hydroxide aniline benzene benzoic acid chloroform chromic acid cupric chloride cupric sulfate dieldrin endosulfan endrin ethylbenzene	EDTA ferric chloride ferric nitrate ferric sulfate ferrous ammonium sulfate ferrous chloride ferrous sulfate formaldehyde formic acid heptachlor hydrochloric acid hydrofluoric acid lead nitrate naphthalene nitric acid phenol phosphoric acid potassium bichromate	potassium hydroxide potassium permanganate sodium bisulfite sodium dodecylbenzenesulfonate sodium fluoride sodium hydroxide sodium hypochlorite sodium nitrite sodium phosphate (dibasic) sulfuric acid toluene trichloroethylene uranyl nitrate xylene zinc chloride zinc nitrate zinc sulfate 2-propanoic acid

DISCHARGE RATE AND FREQUENCY

The average daily flow rates for the sources that discharge to Outfall 051 are provided in Table 6.

Table 6
Source Flow Rates/Frequencies to Outfall 051

Operation/Source	Average Flow (Gallon/Day)	Treatment Code
RLWTF	19,700	1G, 1O, 1S, 1Q, 1R 1U, 2J, 1F, 2K, 2C, 5Q, 5U

SAMPLING AND ANALYSIS FOR RE-APPLICATION

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Mechanical Evaporator and/or Zero Liquid Discharge (ZLD) Solar Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A grab sample for the Form 2C Constituents will be collected for Outfall 051 when/if the RWLTF discharges effluent through the outfall. See the attached Discharge Monitoring Report Outfall Summary for the analytical data collected prior to November 2010.

ANALYTICAL RESULTS PROVIDED

- NPDES Discharge Monitoring Reports (DMRs) from August 2007 – December 2011.
- Material Safety Data Sheets for treatment chemicals.

ADDITIONAL INFORMATION

- Latitude – 35°51'54"
- Longitude – 106°17'54"

Form 2C Section IV.B - Improvements

ZERO LIQUID DISCHARGE (ZLD) PROJECT

The configuration of the RLWTF and Outfall 051 will be changing in the next 5 years due to the construction of two new Concrete Evaporation Tanks at Technical Area (TA) 52 under the Zero Liquid Discharge (ZLD) Project. These evaporation tanks will receive treated effluent from the RLWTF and will reduce the volume of treated effluent discharged to Outfall 051. The evaporation tanks will be connected to the RLWTF by a transfer pipe line that will be approximately 0.75 miles long. Figures 2 and 3 provide copies of the 90% review design drawings for the transfer line and evaporation tanks.

Please print or type in the unshaded areas only

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
NM0890019515

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98

FORM **2C** NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS

Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
051	35.00	51.00	54.00	106.00	17.00	54.00	Mortandad Canyon, an Ephemeral Tributary
							to the Rio Grande (NMAC 28.6.4.128)

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUT-FALL NO. (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
051	Effluent from the RLWTF	19,700 GPD	Neutralization	2	K
	- Process Water (Rad Lab Waste)	(18,150)	Mixing	1	O
	- Cooling Water (Rad Areas)	(1,232)	Chemical Precipitation	2	C
	- Environmental Water (EF Waste)	(50)	Flocculation	1	G
	- Storm Water (sumps etc.)	(268)	Sedimentation (Settling)	1	U
			Rapid Sand Filtration	1	R
			Multimedia Filtration	1	Q
			Reverse Osmosis	1	S
			Ion Exchange	2	J
			Coagulation	2	D
			Vacuum Filtration	5	U
			Evaporation	1	F
			Landfill	5	Q

OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☑ YES (*complete the following table*) ☐ NO (*go to Section III*)

1. OUTFALL NUMBER (*list*)	2. OPERATION(s) CONTRIBUTING FLOW (*list*)	3. FREQUENCY a. DAYS PER WEEK (*specify average*)	3. FREQUENCY b. MONTHS PER YEAR (*specify average*)	4. FLOW a. FLOW RATE (*in mgd*) 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE (*in mgd*) 2. MAXIMUM DAILY	4. FLOW B. TOTAL VOLUME (*specify with units*) 1. LONG TERM AVERAGE	4. FLOW B. TOTAL VOLUME (*specify with units*) 2. MAXIMUM DAILY	C. DURATION (*in days*)
051	TA-50-1 - RLWTF Effluent Normal operating days = 260 days/year	5	12	0.0197 GPD	0.020 GPD	19,700 Gallons	20,000 Gallons	270

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☐ YES (*complete Item III-B*) ☑ NO (*go to Section IV*)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (*or other measure of operation*)?

☐ YES (*complete Item III-C*) ☑ NO (*go to Section IV*)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (*specify*)	2. AFFECTED OUTFALLS (*list outfall numbers*)
NA	NA	NA	NA

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operations of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES (*complete the following table*) ☑ NO (*go to Item IV-B*)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. NO.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED
NA	NA	NA	NA	NA	NA

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (*or other environmental projects which may affect your discharges*) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☒ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

CONTINUED FROM PAGE 2

EPA I.D. NUMBER (copy from Item 1 of Form 1)
NM0890019515

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding – Complete one set of tables for each outfall – Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
Table 2C-4 Sodium Hydroxide	Treatment Chemical - Adjust pH and Promote Precipitation and Flocculation	acetic acid, ammonia, ammonium bifluoride, ammonium carbonate, ammonium chloride, ammonium hydroxide, benzene, chloroform, chromic acid, cupric chloride, cupric sulfate, endrin, EDTA, ferric chloride, ferric nitrate, ferric sulfate, ferrous ammonium sulfate, ferrous chloride, ferrous sulfate, formaldehyde, formic acid, heptachlor, hydrochloric acid, hydrofluoric acid, lead nitrate, nitric acid, Phenol, phosphoric acid, potassium dichromate, potassium hydroxide, potassium permanganate, sodium dodecylbenzenesulfonate, sodium fluoride, sodium hydroxide, sodium hypochlorite, sodium nitrite, sodium phosphate (dibasic), sulfuric acid, uranyl nitrate, zinc chloride, zinc nitrate, zinc sulfate	RLWTF Influent (Based on Waste Profile Form Data) - Process Water NOTE: There were no Table 2C-3 Contaminates Identified
Ferric Sulfate	Treatment Chemical - Promote Precipitation and Flocculation		
EDTA	Treatment Chemical - Clean membranes		
Sodium bisulfite	Treatment Chemical - Clean membranes		
Hydrochloric Acid	Treatment Chemical - Adjust pH		
2-propanoic acid	Treatment Chemicals WEST W-126 + Co-Polymer/Flocculation		
Ammonia, chloroform, nitric acid, trichloroethylene	RLWTF Influent (Based on Waste Profile Form Data) - Storm Water		
Acrolein, ammonia, aniline, benzoic acid, dieldrin, endosulfan, endric, ethylbenzne, naphthalene, phenol, toluene, xylene	RLWTF Influent (Based on Waste Proform Data) - Environmental Restoration Water		

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES (list all such pollutants below) ☑ NO (go to Item VI-B)

NA

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☑ YES (*identify the test(s) and describe their purposes below*) ☐ NO (*go to Section VIII*)

Whole Effluent Toxicity 48 hr Acute Toxicity - FAILED
Daphnia Pulex, 3-hr composite (2 samples, collected ~24 hours apart), Quarterly

See the DMR Outfall Data Summary Report for the detailed results.

Currently Conducting Toxicity Identification Evaluations TIE) and Toxicity Reduction Evolutions (TRE)

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☑ YES (*list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below*) ☐ NO (*go to Section IX*)

A. NAME	B. ADDRESS	C. TELEPHONE (*area code & no.*)	D. POLLUTANTS ANALYZED (*list*)
GEL General Engineering labs	2040 Savage Rd Charleston, SC 29407	843-556-8171	Metals, VOC, SVOC, Pesticides, Radiological, Water Quality Parameters
SWRI Southwest Research Institute	Division 01 6220 Culebra Rd San Antonio, TX 78238	210 522-3867	Arsenic, Selenium
Cape Fear Analytical	3306 Kitty Hawk Rd Suite 120 Wilmington, NC 28405	910-795-0421	Dioxins and Furans
Pacific EcoRisk	2250 Cordelia Rd Fairfield, CA 94534	707-207-7760	WET Testing
New Mexico Water Testing Laboratory INC	401 N. Coronado Ave Espanola, NM 87532	505-929-4545	E-Coli

IX. 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 & OFFICIAL TITLE (*type or print*)	B. PHONE NO. (*area code & no.*)
Kevin W. Smith, Manager, DOE/Los Alamos Site Office	(505) 606-2004
C. SIGNATURE K. W. Smith	D. DATE SIGNED 1/27/2012

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (*identify the test(s) and describe their purposes below*) ☐ NO (*go to Section VIII*)

EXTRA PAGE FOR SIGNATURE

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☐ YES (*list the name, address, and telephone number of, and pollutants analyzed by each such laboratory or firm below*) ☐ NO (*go to Section IX*)

A. NAME	B. ADDRESS	C. TELEPHONE (*area code & no.*)	D. POLLUTANTS ANALYZED (*list*)

IX. 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 & OFFICIAL TITLE (*type or print*)	B. PHONE NO. (*area code & no.*)
Alison M Dorries, Division Leader, ENV Protection Division	(505) 665-6952
C. SIGNATURE	D. DATE SIGNED

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
NM0890019515

V. INTAKE AND EFFLUENT CHARACTERISTICS (*continued from page 3 of Form 2-C*) [redacted]

OUTFALL NO.
051

PART A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS (*specify if blank*)		4. INTAKE (*optional*)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (*BOD*)												
b. Chemical Oxygen Demand (*COD*)												
c. Total Organic Carbon (*TOC*)												
d. Total Suspended Solids (*TSS*)												
e. Ammonia (*as N*)												
f. Flow	VALUE											
g. Temperature (*winter*)	VALUE											
h. Temperature (*summer*)	VALUE											
i. pH	MINIMUM											

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A composite sample for the Form 2C Constituents will be collected from Outfall 051 when/if the RWLTF discharges effluent to Mortandad Canyon. See the DMR Outfall Summary for the analytical data collected prior to November 2010.

PART B – Mark "X" in column 2-a for each p... directly, or indirectly but express... quantitative data or an explanatio... ...nt which is limited either ...n 2a, you must provide

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		(*if available*)		(*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)	X													
b. Chlorine, Total Residual	X													
c. Color		X												
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)	X													
f. Nitrate-Nitrite (as N)	X													

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X													
h. Oil and Grease	X													
i. Phosphorus (as P), Total (7723-14-0)	X													
j. Radioactivity														
(1) Alpha, Total	X													
(2) Beta, Total	X													
(3) Radium, Total	X													
(4) Radium 226, Total	X													
k. Sulfate (as SO_4) (14808-79-8)	X													
l. Sulfide (as S)		X												
m. Sulfite (as SO_3) (14265-45-3)		X												
n. Surfactants	X													
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)	X													
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)	X													
u. Molybdenum, Total (7439-98-7)	X													
v. Manganese, Total (7439-96-5)	X													
w. Tin, Total (7440-31-5)	X													
x. Titanium, Total (7440-32-6)		X												

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A composite sample for the Form 2C Constituents will be collected from Outfall 051 when/if the RWLTF discharges effluent to Mortandad Canyon. See the DMR Outfall Summary for the analytical data collected prior to November 2010.

CONTINUE ON PAGE V-3

CONTINUED FROM PAGE 3 OF FORM 2-C

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
NM0890010515	051

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total (7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)		X													
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)		X													
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)		X													
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total		X													
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A composite sample for the Form 2C Constituents will be collected from Outfall 051 when/if the RWLTF discharges effluent to Mortandad Canyon. See the DMR Outfall Summary for the analytical data collected prior to November 2010.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X" a. TESTING REQUIRED	2. b. BELIEVED PRESENT	2. c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	3. a. (2) MASS	3. b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	3. b. (2) MASS	3. c. LONG TERM AVRG VALUE (*if available*) (1) CONCENTRATION	3. c. (2) MASS	3. d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	4. b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. a. (2) MASS	5. b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)		X													
4V. Bis (*Chloro-methyl*) Ether (542-88-1)															
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodi-bromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloro-ethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichloro-bromomethane (75-27-4)			X												
13V. Dichloro-difluoromethane (75-71-8)															
14V. 1,1-Dichloro-ethane (75-34-3)			X												
15V. 1,2-Dichloro-ethane (107-06-2)			X												
16V. 1,1-Dichloro-ethylene (75-35-4)			X												
17V. 1,2-Dichloro-propane (78-87-5)			X												
18V. 1,3-Dichloro-propylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A composite sample for the Form 2C Constituents will be collected from Outfall 051 when/if the RWLTF discharges effluent to Mortandad Canyon. See the DMR Outfall Summary for the analytical data collected prior to November 2010.

CONTINUE ON PAGE V-5

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloro-ethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloro-ethane (71-55-6)			X												
28V. 1,1,2-Trichloro-ethane (79-00-5)			X												
29V Trichloro-ethylene (79-01-6)			X												
30V. Trichloro-fluoromethane (75-69-4)															
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichloro-phenol (120-83-2)			X												
3A. 2,4-Dimethyl-phenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitro-phenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachloro-phenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichloro-phenol (88-05-2)			X												

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A composite sample for the Form 2C Constituents will be collected from Outfall 051 when/if the RWLTF discharges effluent to Mortandad Canyon. See the DMR Outfall Summary for the analytical data collected prior to November 2010.

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X" a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (*a*) Anthracene (56-55-3)			X												
6B. Benzo (*a*) Pyrene (50-32-8)			X												
7B. 3,4-Benzo-fluoranthene (205-99-2)			X												
8B. Benzo (*ghi*) Perylene (191-24-2)			X												
9B. Benzo (*k*) Fluoranthene (207-08-9)			X												
10B. Bis (*2-Chloroethoxy*) Methane (111-91-1)			X												
11B. Bis (*2-Chloroethyl*) Ether (111-44-4)			X												
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)			X												
13B. Bis (*2-Ethylhexyl*) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloro-naphthalene (91-58-7)			X												
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (*a,h*) Anthracene (53-70-3)			X												
20B. 1,2-Dichloro-benzene (95-50-1)			X												
21B. 1,3-Di-chloro-benzene (541-73-1)			X												

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Effluent Evaporator and/or ZLD Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichloro-benzene (106-46-7)			X												
23B. 3,3-Dichloro-benzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131-11-3)		X													
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitro-toluene (121-14-2)			X												
28B. 2,6-Dinitro-toluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenyl-hydrazine (*as Azo-benzene*) (122-66-7)			X												
31B. Fluoranthene (206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachloro-benzene (118-74-1)			X												
34B. Hexachloro-butadiene (87-68-3)			X												
35B. Hexachloro-cyclopentadiene (77-47-4)			X												
36B Hexachloro-ethane (67-72-1)			X												
37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitro-sodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Tri-chlorobenzene (120-82-1)			X												
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Enosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

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EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
NM0890019515	051

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

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EPA Form 3510-2C (8-90)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT RE-APPLICATION

PERMIT NO. NM0028355

for:

Los Alamos National Laboratory
Los Alamos, New Mexico

submitted by:

U. S. Department of Energy
Los Alamos Area Office

and

University of California

prepared by:

Los Alamos National Laboratory
Water Quality and Hydrology Group (ESH-18)
NPDES Permit Re-Application Team

May 1998

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ACRONYMS AND ABBREVIATIONS

AO	Administrative Order
BPJ	Best Professional Judgment
CAA	Clean Air Act
CAT-X	Categorical Exclusion
CFR	Code of Federal Regulations
CST	Chemical Science and Technology
CST-9	Inorganic Trace Analysis Group
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOE/AL	DOE Albuquerque Operations Office
DOE/LAAO	DOE Los Alamos Area Office
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ESH	Environment, Safety and Health
ESH-5	Industrial Hygiene Group
ESH-18	Water Quality and Hydrology Group
ESH-20	Ecology Group
FFCA	Federal Facilities Compliance Agreement
FIMAD	Facility for Information, Management, Analysis, and Display Group
FMU	Facility Management Unit
FONSI	Finding of No Significant Impact
FOTW	Federally Owned Treatment Works
GPS	Global Positioning System
HEWTF	High Explosives Wastewater Treatment Facility
LANSCE	Los Alamos Neutron Science Center
LANL	Los Alamos National Laboratory
MGD	Million Gallons Day
MSDS	Material Safety Data Sheet
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NPDES	National Pollutant Discharge Elimination System
NOI	Notice of Intent to Discharge
O&M	Operations and Maintenance
OSRs	Operational Safety Reviews
PCBs	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
R&D	Research & Development
RCRA	Resource Conservation and Recovery Act
RLWTF	Radioactive Liquid Waste Treatment Facility
SDWA	Safe Drinking Water Act

ACRONYMS AND ABBREVIATIONS (Con't)

SIC	Standard Industrial Classification
SOP	Safe Operating Procedure
SWSC	Sanitary Wastewater System Consolidation
TAs	Technical Areas
TSCA	Toxic Substances Control Act
UC	University of California
USCOE	U. S. Corps of Engineers
USF&W	U. S. Fish and Wildlife Service
WAC	Waste Acceptance Criteria
WMC	Waste Management Coordinator
WPF	Waste Profile Form
WSC	Waste Stream Characterization Program or Corrections Project

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1. INTRODUCTION

This document is an application for renewal of the National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 submitted to the U. S. Environmental Protection Agency (EPA) by the U.S. Department of Energy (DOE) and University of California (UC), Los Alamos National Laboratory ("LANL" or "Laboratory"). The DOE and LANL are herein referred to as the NPDES Permit "applicant."

NPDES Permit No. NM0028355 is currently the only active NPDES Industrial Wastewater Permit at the Laboratory. On December 29, 1997, the Laboratory's second NPDES Industrial Wastewater Permit No. NM0028576 for the Fenton Geothermal Site, was discontinued by the EPA at the request of the Laboratory and the DOE. (Appendix A provides a copy of associated documentation).

Also, the Laboratory's storm water runoff will not be reflected in this re-application. Currently, the Laboratory's storm water runoff is regulated under a New Mexico General Notice of Intent (NOI) to Discharge approved by the New Mexico Environment Department (NMED). The Laboratory's Point Source Storm Water Program is also covered by a single EPA NPDES Storm Water Baseline General Permit for Industrial Activity. This Permit expired on September 9, 1997, and under EPA guidance, the Laboratory applied for an extension of the Baseline General Permit until EPA publishes the modified Multi-Sector General Permit. The Laboratory will be applying for a Multi-Sector General Permit to cover storm water runoff upon publication of EPA guidance.

This re-application for NPDES Permit No. NM0028355 is submitted in accordance with the provisions of the Clean Water Act (CWA), 33 U.S.C. 1251 and the NPDES Permit Program requirements listed in 40 CFR 122.21. It is the intent of this summary to provide the EPA Permit Writer and others with adequate background information concerning environmental and other conditions at the Laboratory for review of technical data presented in this re-application. The applicant suggests that because of the uniqueness of LANL operations and their significant diversity and complexity, that the EPA Permit Writer visit the Laboratory during the review process to gain firsthand knowledge and understanding of the information and issues presented in this re-application document.

Due to the complex nature of the NPDES Permit Re-Application and potential need for supplemental information, the applicant requests that all previous applications, modifications, maps, data, and pertinent correspondence submitted in reference to NPDES Permit No. NM0028355 be considered as part of this re-application package by reference. In addition, all future document submittals such as current permit modifications, or additional data and/or correspondence concerning NPDES Permit No. NM0028355 transmitted to the EPA up to the time the new permit is issued, should be considered part of this re-application. The applicant will continue to provide copies of all such information to the EPA Permit Writer as new information becomes available.

2. FACILITY DESCRIPTION

This section describes the research activities, organization, and environment of the Laboratory. Soil conditions, area geology, groundwater conditions, climate and surface water conditions, are also discussed because they impact the understanding of the Laboratory's surface water discharges.

2.1 Laboratory Research Activities

The Los Alamos National Laboratory is a multidisciplinary/multiprogram laboratory. Although the Laboratory's central mission is to reduce the nuclear danger through evaluation and stockpile stewardship, the Laboratory also provides significant programmatic support to many civilian efforts. Because of evolving technologies and changing national priorities, the Laboratory increasingly uses its multidisciplinary research and development capabilities to solve civilian problems in the areas of health, national infrastructure, energy, education, aeronautics, and the environment. Extensive basic research programs in physics, chemistry, metallurgy, mathematics and computers, earth sciences, and electronics support these efforts.

2.2 Laboratory Organization

The Laboratory is managed by the Regents of the University of California. The Laboratory's contract is administered through the DOE Los Alamos Area Office (DOE/LAAO) and the Albuquerque Operations Office (DOE/AL). Laboratory facility maintenance support services are provided by Johnson Controls Northern New Mexico, a wholly-owned subsidiary of Johnson Controls World Services. Laboratory security and fire protection services are provided by Protective Technologies Los Alamos and the Los Alamos County Fire Department, respectively.

2.3 Laboratory Environment

The Laboratory and the associated residential areas of Los Alamos and White Rock are located in Los Alamos County, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe (Figure 1). The 43-square mile Laboratory and adjacent communities are situated on the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep east-to-west oriented canyons (Figure 2) cut by ephemeral and intermittent streams. The mesa tops range in elevation from approximately 7,800 feet on the flanks of the Jemez Mountains to about 6,200 feet at their eastern termination above the Rio Grande Canyon.

The Laboratory is divided into technical areas (TAs) that are used for building sites, experimental areas, waste disposal locations, roads, and utility rights-of-way. However, these uses account for only a small part of the total land area. Currently, Laboratory facilities are contained within 37 active technical areas (Figure 3) spread over 27,500 acres and comprise approximately 5 million square feet of building area. Land surrounding the Laboratory is largely undeveloped and serves primarily as safety and security buffer zones or, the land is being held in reserve by DOE for future use. Due to safety and security issues, limited access by the public is allowed in certain areas of the Laboratory. Large tracts of surrounding land are also held by the Santa Fe National Forest, Bureau of Land Management, Bandelier National Monument, General Services Administration, and San Ildefonso Pueblo.

The communities closest to the Laboratory facilities are Los Alamos Townsite, which is just north of the Laboratory, and White Rock, located a few miles to the east-southeast. Most of Los Alamos County, as well as adjoining portions of neighboring Sandoval, Rio Arriba, and Santa Fe Counties, is undeveloped. The only significant developments in Los Alamos County are the Laboratory facilities and the associated residential communities. Land ownership distribution for Los Alamos County is shown in Figure 4. Los Alamos County has an estimated 1996 population of approximately 18,000 (BBER 1995).

In 1996, the Los Alamos Townsite, the original area development (and now including residential areas known as Eastern Area, Western Area, North Community, Barranca Mesa, and North Mesa), has an estimated population of 12,000. The White Rock area (including the residential areas of White Rock, La Senda, and Pajarito Acres) has about 6,000 residents. About one-third of the people employed in Los Alamos commute from other counties. Population estimates for 1996 place about 246,000 people within a 50 mile radius of Los Alamos.

2.4 Geology

Los Alamos National Laboratory is located in Northern New Mexico on the Pajarito Plateau, which extends eastward from the Jemez Mountains (Figure 5). The Laboratory is bordered on the east by the Rio Grande, within the Rio Grande Rift. The Pajarito Plateau is capped by rocks of the Bandelier Tuff, consisting of volcanic ashfall deposits and pyroclastic flows erupted from the Jemez Mountains volcanic center about 1.2 to 1.6 million years ago (Figure 6). The tuff is over 1,000 ft thick in the western part of the plateau and thins eastward to about 250 ft above the Rio Grande.

On the western part of the Pajarito Plateau, the Bandelier Tuff overlaps onto the Tschicoma Formation, which consists of older volcanics that form the Jemez Mountains (Figure 6). The tuff is underlain by the Puye Formation conglomerate beneath the central and eastern portion of the plateau. Cerros del Rio basalt flows interfinger with the conglomerate beneath the Laboratory. These formations overlie the sediments of the Santa Fe Group, which extend across the Rio Grande Valley and are more than 3,300 ft thick.

2.5 Soil Conditions

A soil survey of Los Alamos County was prepared by the U.S. Department of Agriculture, Soil Conservation Service, and Forest Service. This soil survey was published in June, 1978, under DOE Contract W-7405-ENG.36. The soil survey classifies soils according to soil series, soil type, and soil phase.

The principal parent materials of about 95 percent of the Los Alamos soils are Bandelier Tuff, volcanic rocks of the Tschicoma and Puye Formations, and the Cerros del Rio Basalts of Chino Mesa, and the remnants of El Cajete pumice. The remaining five percent of the soils were formed from colluvium, alluvium, andesitic rocks of the Paliza Canyon Formation, Cerro Rubio Quartz Latites, and tuffs associated with sediments of Cerro Toledo Rhyolite. Textures of these soils range from very fine sandy loams and clay loams to gravelly, sandy loams and stony, silty clay loams (See Figure 7).

2.6 Climate and Surface Water

Rainfall in the Los Alamos area totals about 18 in/yr. and varies greatly with elevation. The plateau is semiarid, with ponderosa forest at higher elevations giving way to pinon-juniper as elevation decreases. The plateau is separated into finger-like mesas by canyons, which contain riparian vegetation and small ephemeral streams that for the most part have short-lived or intermittent flow during runoff events. (Refer to Appendix B for a map depicting the Laboratory's springs and surface water bodies)

Perennial springs on the flanks of the Jemez Mountains supply base flow intc upper reaches of some canyons, but the volume is insufficient to maintain surface flows across the Laboratory site before streams are depleted by evaporation, transpiration, and infiltration. Runoff in some canyons, resulting from large thunderstorms or heavy snowmelt, reaches the Rio Grande several times a year. Effluents from sanitary sewage, industrial waste treatment plants, and cooling-tower blowdown enter some canyons at rates sufficient to maintain surface flows for varying distances.

Canyons located within Laboratory boundaries ultimately drain to the Rio Grande. The Rio Grande then flows southward to Cochiti Lake through the middle and on into the lower Rio Grande Basin. The Rio Grande surface waters downstream of Los Alamos are used primarily for crop irrigation in central and southern New Mexico. Laboratory outfalls impact surface water in the area of the Laboratory insofar as they discharge to drainage areas or into the canyons. The following canyons receive NPDES point source discharges from LANL: Los Alamos, Sandia, Mortandad, Canon de Valle, Pajarito, Canada del Buey, Water, Pueblo, Guaje, and Rendija. Except during major runoff events, the cumulative flow of wastewater discharges does not reach the Rio Grande. The intermittent runoff leaving Laboratory property has been measured at gaging stations located on each major canyon. These flow measurements have been published for water years 1995, 1996, and 1997 and are provided in Appendix Y. Appendix C presents a listing noting each outfall included in the re-application, and the canyon to which it discharges. Appendix D provides a listing of the distances from existing NPDES permitted outfalls to the Rio Grande.

Currently, designated State Water Quality Standards do not exist for the intermittent drainages located within the Laboratory boundaries, only for the Rio Grande itself. Laboratory drainages eventually enter into two different stream segments of the Rio Grande (2-111 and 2-118). New Mexico Stream Standards for stream segment 2-111 and 2-118, specifiy these reaches of the Rio Grande as follows: segment 2-111 includes "the main stem of the Rio Grande from the headwaters of Cochiti Reservoir upstream to the Taos Junction Bridge..., and segment 2-118 includes "perennial tributaries to the Rio Grande in Bandelier National Monument and their headwater in Sandoval County, all perennial reaches of tributaries to the Rio Grande in Santa Fe County unless included in other segments."

Designated uses as delineated in the New Mexico Stream Standards for stream segment 2-111 include: irrigation; livestock and wildlife watering; wildlife habitat; marginal cold water fishery; secondary contact; and, warm water fishery. In addition, designated uses for stream segment 2-118 include: domestic water supply; high quality coldwater fishery; irrigation; livestock watering; wildlife habitat; municipal and industrial water supply; secondary contact; and, primary contact. *State of New Mexico Standards for Interstate and Intrastate Streams* are provided in Appendix E.

2.7 Groundwater Occurrence

Groundwater beneath the Pajarito Plateau occurs in three modes, two of which are perched (Figure 8). Perched water is a body of groundwater above a less permeable layer that is separated from an underlying main body of groundwater by an unsaturated zone. The three modes of groundwater occurrence at the Laboratory are: (1) perched alluvial groundwater in canyon bottoms; (2) limited-extent zones of intermediate depth perched groundwater whose location is controlled by subsurface changes in rock type and permeability; and, (3) the regional aquifer beneath the Pajarato Plateau. These types of groundwater are described in more detail below.

Streams have filled some parts of canyon bottoms with alluvium ranging up to as much as 100 ft in thickness. Runoff percolates through the alluvium until it is impeded by less permeable layers of tuff. This creates shallow bodies of perched groundwater within the alluvium. As water in the alluvium moves down the canyon, it is depleted by evapotranspiration and infiltration into underlying rocks.

The regional aquifer of the Los Alamos area occurs at a depth of 1200 ft along the western edge of the plateau, and 600 ft along the eastern edge (Figure 6). This is the only aquifer in the area capable of serving as a municipal water supply. The surface of the aquifer rises westward from the Rio Grande within the Tesuque Formation (part of the Santa Fe Group). The aquifer rises further into the lower part of the Puye Formation beneath the central and western part of the plateau (Figures 6 and 8). Depth to the regional aquifer is about 1,000 ft beneath the mesa tops in the central part of the plateau. The regional aquifer is separated from alluvial and perched waters by about 350 to 620 ft of unsaturated tuff and sediments with low (<10%) moisture content.

Beneath portions of Pueblo, Los Alamos, and Sandia Canyons, perched groundwater occurs at intermediate depths within the thick zone of unsaturated rock underlying the alluvium. The intermediate perched groundwater occurs within the lower part of the Bandelier Tuff and within the underlying conglomerates and basalt (Figure 8). The perched groundwater has been found at depths ranging from about 120 ft in Pueblo Canyon, to about 450 ft in Sandia Canyon. Its location is controlled by variations in the permeability of the rocks underlying the plateau. These intermediate-depth groundwater bodies are formed in part by recharge from the overlying perched alluvial groundwater. Perched water also occurs within the Bandelier Tuff at the western Laboratory border near the Jemez Mountains. The source of this perched water may be infiltration from streams discharging from the mouths of canyons along the mountain front, and underflow of recharge from the Jemez Mountains.

Currently, the municipal and industrial water supply for the Laboratory and community is from 14 deep wells in three well fields. The well fields include the Guaje Well Field and the on-site Pajarito and Otowi Well Fields. The Guaje Well Field, located northeast of the Laboratory, contains seven wells, five of which have had significant production through 1996. The five wells of the Pajarito Well Field are located in Sandia and Pajarito Canyons and on mesa tops between those canyons. Otowi #1 and Otowi #4, the first wells in a new field designated as the Otowi Well Field, were completed in 1990. Otowi #4 resumed production in 1996 after pump problems were repaired. Otowi #1 had a new pump installed during 1996 and is currently contributing to the production of the Laboratory's water supply.

Four new "Guaje Replacement Wells" (#1, #2, #3, and #4) are proposed to replace five of the six existing Guaje Wells #1, #2, #4, #5, and #6. The blowdowns from the five Guaje Wells to be replaced are currently assigned the EPA outfall numbers 04A171, 04A173, 04A174, 04A175, and 04A176. Outfalls 04A172, 04A173, and 04A174 associated with Guaje Wells #1A, #2, and #4 are currently included in the re-application, however, it is expected that these three wells will become inoperable in late 1998 and will be eliminated from the NPDES Permit sometime in1999.

Surface, well, and spring waters are sampled routinely and analyzed for organic and inorganic chemical constituents, microbiological organisms, and radioactivity. Analytical results are published annually in the Environmental Surveillance Report prepared by the Laboratory's Environmental Surveillance Program. Safe Drinking Water Act (SDWA) sampling results for 1997 are provided as supporting documentation to Forms 2C and 2D for the Laboratory's drinking water wells. Copies of the Laboratory's Environmental Surveillance Report are submitted to the EPA Regional Administrator and the Director of the NMED annually. A listing of all existing and proposed production wells and booster stations included in this re-application are provided in Appendix C. In addition, the location of existing production wells are noted in Appendix F.

3. 1990 NPDES PERMIT RE-ISSUANCE/RE-CERTIFICATION ISSUES

During the Laboratory's 1990 NPDES Permit Re-Application process, a number of issues arose regarding the application of the New Mexico Water Quality Standards. Table 1 below provides a chronology of events which briefly describes some of these issues.

Table 1, 1990 NPDES Permit Chronology of Events

Date	Event
September 1990	LANL submits application for new permit.
October 1990	EPA issues preliminary draft permit.
March 1991	Previous NPDES permit expires. Permit continued pursuant to 40 CFR 122.6.
May 1991	EPA issues draft permit.
August 1991	LANL comments on draft permit.
August 1991	NMED denies certification of permit.

September 1991	NMED proposes to address State Water Quality Standards issues.
November 1991	EPA visits Laboratory and NMED.
March 1992	EPA issues draft permit.
April 1992	NMED comments on preliminary draft permit.
May 1992	EPA issues draft permit.
July 1992	LANL comments on draft permit.
July 1992	NMED issues conditional certification.
August 1992	EPA reopens certification period.
September 1992	NMED issues new conditional certification.
October 1992	LANL appeals certification to NMWQCC.
December 1992	Hearing date set for March 2, 1993.
December 1992	NMED replies to LANL Petition for Review.
January 1993	NMED and LANL request delay until April, 1993.
January 1993	New Hearing date set for April 20, 1993.
April 1993	Settlement Agreement reached: NMED re-certified the NPDES Permit conforming to Livestock & Wildlife Watering Standards and LANL withdraws its appeal and agrees to Water Use Study.
July 1993	EPA holds public hearing in May 1992 for draft permit.
September 1993	EPA issues final NPDES Permit No. NM0028355.
October 1993	LANL files an "Intent to Request an Evidentiary Hearing" on the EPA-issued permit to rectify errors.
January 1994	EPA drafts final NPDES Permit with corrections.
June 1994	EPA re-issues final NPDES Permit No. NM0028355, effective August 1, 1994.
August 1994	Final NPDES Permit No. NM0028355 effective.
October 1996 to October 1997	U.S. Fish and Wildlife performs Water Use Study at the Laboratory.
October 1998	Current NPDES Permit expires.

Initially, the State of New Mexico applied standards based on the designated uses of "livestock and wildlife watering" for stream segments No. 2-111 and No. 2-118 of the New Mexico Water Quality Standards for Interstate and Intrastate Streams in New Mexico. Later, the State decided to apply the general standard which applies to existing or attainable uses of these same stream segments. As a result, NMED issued two separate conditions of certification.

In October 1992, UC and DOE petitioned the New Mexico Water Quality Control Commission (NMWQCC) to review NMED's conditional certification of the NPDES permit limits. A hearing date, for presenting arguments to the NMWQCC, was set for March 1993. In January 1993, NMED and LANL requested a delay of the hearing until April 20, 1993. Settlement negotiations took place during the first quarter of 1993, and resulted in a Settlement Agreement with NMED wherein the Laboratory would fund a "Water Use Study" of the receiving channels of the Laboratory's discharges in order to determine potential attainable uses. NMED conditionally certified the permit based on this agreement.

The final NPDES Permit No. NM0028355 was issued to the Laboratory on June 24, 1994, effective August 1, 1994. The *State of New Mexico Standards for Interstate and Intrastate Streams*, dated January 23, 1995, now distinguish the water quality standards for designated uses "livestock and wildlife watering" individually, as livestock watering and wildlife habitat. Refer to Appendix E for a copy of the State Water Quality Standards.

3.1Conditional Certification/Settlement Agreement of "Draft" 1990 Permit Re-Application.

In September 1992, the NMED issued a conditional certification of the draft NPDES Permit for the Laboratory based upon effluent limits to protect the livestock and wildlife watering. The agreement required that a study be conducted for the purposes of identifying the stream uses associated with the watercourses in the canyons at the Laboratory. The Water Use Study was conducted by the U.S. Fish and Wildlife Service (USF&W) in 1997. The USF&W is currently evaluating its findings from the study and a finalized report is due in late 1998. Appendix G provides a copy of the Settlement Agreement.

3.2 Waste Stream Characterization Program and Corrections Project

In 1990, the Laboratory's NPDES Permit Re-Application included a commitment by the Laboratory and the DOE to the EPA to identify and eliminate all non-complying waste streams and un-permitted outfalls.

From 1991-1994, in cooperation with Laboratory facility owners and operators, the Water Quality and Hydrology Group (ESH-18), under the Waste Stream Characterization Program, conducted a Lab-wide waste stream characterization survey. The survey resulted in the identification and documentation of 7,602 deficiencies into 83 final reports. These reports were reviewed with facility owners and operators in order to obtain concurrence on the proposed recommended corrections. These reports were provided to the EPA and NMED.

A schedule for correction of the 7,602 deficiencies was established in Federal Facilities Compliance Agreement (FFCA), Docket No. VI-90-1240, dated July 12, 1990, and Administrative Order (AO), Docket No. VI-90-1263, dated July 19, 1990. The FFCA was issued to the DOE and the AO was issued to the Laboratory by the EPA. The original schedule for the Waste Stream Corrections (WSC) Project in the AO required 25% of the 7,602 deficiencies identified be corrected by September 30, 1994; 50% corrected by September 30, 1995; and, 100% by September 30, 1996. The Laboratory successfully achieved full compliance with the 25% and 50% completion milestones, and met the revised milestone of 100% completion on March 31, 1997. The March 31, 1997 deadline was authorized under the revised FFCA, Docket No. VI-96-1237, dated November 8, 1996, and AO, Docket No. VI-96-1236, dated December 10, 1996. (See Appendix H)

The Laboratory provided institutional funding of approximately $5.3 million to perform the corrective actions needed to bring the Laboratory facilities into compliance with the NPDES Permit. Correction of the 7,602 deficiencies included: (1) physical construction fixes such as elimination of non-compliant waste streams and potential un-permitted discharges, plugging of drains, installation of plumbing modifications including recirculation units; (2) administrative corrections and control measures such as implementation of best management practices (i.e., SOPs, access control, labeling of piping, etc.); and, (3) modification of discharge permit applications required by EPA.

During the WSC Project, operational safety reviews (OSRs) were conducted by the Laboratory's Industrial Hygiene Group (ESH-5) in coordination with Facility Management ESH Teams. The primary objective of the OSRs was to evaluate new and completed waste stream corrections, including plugged drains, for potential operational and worker hazards. Hazard mitigation/abatement corrections included both construction and administrative actions including re-routing of drains and operator control of discharges in compliance with NPDES Permit requirements.

In order to document and report completion of this work to EPA and NMED, all waste stream deficiencies identified and corrected have been tracked and verified by use of a database system developed by the Laboratory. Outfall-related information from this database was used in the preparation of this re-application. Appendix I is a background summary and documentation of accomplishments regarding the Waste Stream Characterization Program and WSC Project.

Benefits attributable to completion of the Waste Stream Characterization Program and WSC Project include: proper characterization of outfall discharges; elimination of 75 un-permitted outfalls; elimination of over 30 outfalls as a result of waste stream corrections and significant water conservation; and, reduction of contaminants entering into the environment from these discharges.

4. OUTFALL REDUCTION

The Laboratory's 1990 NPDES Permit Re-Application contained consolidated information for 117 outfalls. By October, 1993, an additional 24 outfalls were added to the Permit bringing the total number of permitted outfalls to 141. A summary of the Outfall Reduction Program is described below.

In 1995, the Laboratory initiated the NPDES Outfall Reduction Program. Activities accomplished under the NPDES Outfall Reduction Program are consistent with the objectives set forth in the *Laboratory's Business Plan for NPDES Permit Compliance*, dated March 31, 1995. The Business Plan was prepared by the ESH-18 Group's NPDES Outfall Team to: (1) provide a framework for unifying and coordinating Laboratory NPDES Program compliance activities; (2) develop and implement the NPDES Permit Compliance and Outfall Reduction Programs at the Laboratory; and, (3) insure and improve compliance with the CWA and the Laboratory's NPDES Permit.

The primary objective of the Laboratory's NPDES Outfall Reduction Program was to perform an in-depth assessment of permitted outfalls to determine candidate outfalls for elimination. The overall goal of the NPDES Outfall Reduction Program is to reduce pollution into the environment by eliminating wastewater effluent discharges from permitted outfalls. Additional benefits provided by the NPDES Outfall Reduction Program include: (1) reduction of administrative costs associated with sampling, monitoring, chemical testing, and reporting of outfall effluents; (2) conservation of water; (3) reduction of NPDES Permit exceedances; and, (4) an increase in overall compliance with the CWA and NPDES Permit requirements.

Under the NPDES Outfall Reduction Program, 107 permitted outfalls were identified and targeted for elimination. The 107 target outfalls cover all types of wastewater systems including, sanitary (Category S), radioactive (Category 051), and industrial. Industrial effluents are further broken down into waste stream categories by the Laboratory's NPDES Permit. These NPDES waste stream categories include: 001 Power Plant; 02A Steam Plant; 03A Treated Cooling Water; 04A Non-Contact Cooling and Water Production Facilities; 05A High Explosives Wastewater Discharge; 06A Photo Rinsewater; 07A Asphalt Batch Plant; and, 128 Printed Circuit Board Discharge.

As of February, 1998, 92 outfalls of the 107 targeted, have been eliminated Lab-wide from the NPDES Permit. The elimination of an additional 15 outfalls by October, 1998, is pending completion of physical construction and approval from the NMED and the EPA. The elimination of 107 outfalls total will have resulted from several activities including: (1) the removal of process flows; (2) re-piping of wastewater drain systems; (3) modification, removal, replacement or installation of equipment such as package recirculation units; and, (4) plugging of open floor drains. In addition, the construction of the Laboratory's TA-46 Sanitary Wastewater System Consolidation (SWSC) Facility and the TA-16 High Explosives Wastewater Treatment Facility (HEWTF), contributed significantly to outfall reduction accomplishments.

Following completion of all scheduled outfall reduction activities, the Laboratory is expected to have 34 remaining outfalls. This re-application contains the required Form 2C information for these 34 outfalls and also contains Form 2D information for 13 new discharges originating from the new Guaje Wells and potable water supply system.

Future activities are planned at the Laboratory to further reduce the number of permitted outfalls to 16. The goal of 16 NPDES permitted outfalls, will be accomplished as a result of the long-term NPDES Outfall Reduction Program objectives which are supported by Laboratory Division Directors, Facility Managers, and/or outfall owners. Outfall owners will be encouraged to develop designs and plant modifications which provide for "reduced" or "no flow" outfall wastewater effluent discharge systems. For a graphical depiction of the history of outfall reduction at the Laboratory, see Appendix I.

4.1 TA-46 Sanitary Wastewater System Consolidation (SWSC) Facility

In November, 1992, the construction of the Laboratory's TA-46 SWSC Facility was completed. Construction of the SWSC Facility eliminated eight of the Laboratory's nine sanitary treatment facilities, plus 32 septic tank systems. As a result, eight permitted outfalls (Category S), were eliminated and overall compliance significantly increased (See Appendix K). The only sanitary outfall remaining to-date is Outfall 13S located at the new TA-46 SWSC Facility. A map depicting the SWSC collection system is provided as Appendix L.

The influent to the TA-46 SWSC Facility is similar to the influent contributed to a Publicly Owned Treatment Works (POTW) operated by a municipality, i.e., the influent is primarily derived from sanitary waste sources (toilets, sinks, kitchens, floor washings, etc.), but also contains small contributions from industrial-type activities. However, due to the discharge of industrial-type wastewater and the fact that it is owned by the DOE, by definition the SWSC Facility is a Federally Owned Treatment Works (FOTW).

As previously described in Section 3.2, the 1991-1997 Waste Stream Characterization Program and WSC Project accomplished: (1) a Lab-wide characterization of wastewater effluents, including the inspection of facilities contributing influent to the sanitary wastewater treatment facility; (2) the identification of wastewater discharge deficiencies; and, (3) the implementation of corrective actions including administrative controls, which would assure that measures are in place to control contributions of industrial and chemical waste into the sanitary system. The WSC Project also accomplished a lab-wide posting of warning signs at sinks and drains in an effort to eliminate such wastes from discharging into the sanitary sewer.

The Laboratory has implemented the Waste Acceptance Characterization, and Certification Program which further reduces the potential discharge of incompatible waste to the TA-46 SWSC Facility and to other treatment facilities, by requiring adherence with strict waste acceptance criteria. This Program is described in more detail in Section 6.0 following.

4.1.1 Management of Laboratory's Sanitary Treatment Solids

The TA-46 SWSC Facility discharges domestic wastewater effluent originating from the Laboratory. Since the SWSC Facility opened in 1992, all sludge and grit/screenings have been managed as separate waste streams: sludge has been land applied in accordance with Part 503 Regulations of the CWA and by Part II.K.c Sewage Sludge Requirements of the Laboratory's NPDES Permit, and grit/screenings have been disposed of at the Los Alamos County Landfill under New Mexico Solid Waste Regulations. (Refer to Appendix M, for a copy of the Laboratory's *Administrative Procedures for the Handling, Disposal, and Reuse of Sanitary Treatment Solids*, LANL-ESH-18-602, September, 1994).

As a result of the detection of low concentrations (less than or equal to 4.38 ppm) of polychlorinated biphenyls (PCBs) in SWSC Facility sludge, the land application of sludge was suspended in May, 1996. The Laboratory is currently disposing of all SWSC Facility sewage sludge as a PCB-contaminated waste at a landfill permitted under the Toxic Substances Control Act (TSCA). Refer to

Appendix M for a copy of the Laboratory's "Draft" *Interim Management Procedures for Sanitary Treatment Solids*, dated February 3, 1998. These draft interim management procedures are not intended to be a stand-alone document but as an addendum to the Laboratory's *Administrative Procedures for the Handling, Disposal and Reuse of Sanitary Treatment Solids* (LANL-ESH-18-602). This addendum is intended to cover management practices not addressed in the LANL-ESH-18-602 Procedures.

A "Notice of Planned Change" to landfill the sludge was submitted to EPA Region 6 on July 31, 1997. EPA approved this change in the Laboratory's sludge disposal practice as required by Part II, Section K.e. of the Laboratory's NPDES Permit. Refer to Appendix M, letter from Mr. Nelson Hunt EPA Region 6, to Mr. Steven Rae, LANL, November 13, 1997. The LANL and the DOE are actively seeking concurrence from all state and federal regulatory authorities on a final disposal method.

4.1.2 Septic Tank Systems

There are numerous remote buildings and structures not connected to the TA-46 SWSC Facility that must rely on a variety of on-site sanitary wastewater treatment systems, which include holding tanks and septic tanks with absorption (leach) fields, seepage pits, or evapotranspiration beds.

As present, there are 35 permitted septic tank systems located throughout Laboratory boundaries. (See Appendix O). Of these, nine are holding tanks, 17 discharge to either a seepage pit or leach field, two discharge to sand filters, two have evapotranspiration beds, two have drain lines, two discharge to an absorption trench, and one discharges to a filter trench. The construction of the TA-46 SWSC Facility has eliminated 32 of the original 87 permitted septic tank and holding tank systems and an additional 20 have been abandoned in place. These disconnected and abandoned systems will be decommissioned under the Laboratory's Environmental Restoration Project.

The Laboratory's on-site sanitary liquid waste treatment systems are governed by the following regulations, Laboratory permits, and requirements:

- State of New Mexico Liquid Waste Disposal Regulations, 20 NMAC 7.3
- NPDES Outfall Permit No. NM0028355 for the TA-46 SWSC Facility (Outfall 13S).
- State of New Mexico Ground and Surface Water Quality Protection Regulations, 20 NMAC 6.2

Wastewater from holding tanks and septic tank systems meeting the Waste Acceptance Criteria (WAC) for the TA-46 SWSC Facility is periodically pumped and hauled to this facility for treatment.

4.2 TA-16 High Explosives Wastewater Treatment Facility (HEWTF)

In October 1997, construction of the TA-16 HEWTF was completed. As a result of the construction of the HEWTF,17 of 21 high explosive (Category O5A) wastewater outfalls have been eliminated and overall effluent reduction of 99% has been realized through waste minimization efforts. Construction of the HEWTF and associated collection system now allows for the transfer of HE-contaminated fluids from existing building sumps to the treatment facility, rather than continued discharge to the environment from on-site outfalls at TA-9,11,16, and 22. Construction measures to eliminate permitted discharges from two HE outfalls are completed and pending regulator approval for deletion of the outfalls from the Laboratory's NPDES Permit. Once EPA approval is received, only two HE outfalls will remain in the new NPDES Permit. The two remaining Category 05A outfalls are: Outfall 05A055, located at the new TA-16 HEWTF; and Outfall 05A097, located at TA-11.

4.3 National Environmental Policy Act (NEPA) Issues

As required by the DOE's National Environmental Policy Act (NEPA) Regulations, two Environmental Assessments were performed by DOE/LAAO with the assistance of ESH-18 and the Laboratory's Ecology Group (ESH-20) to determine impacts to the environment due to the reduction of effluent and elimination of outfalls. On September 29, 1995, the DOE/LAAO issued a "Finding of No Significant Impact (FONSI)" for high explosives wastewater outfalls which could be eliminated as a result of the construction of the HEWTF.

Additionally, a categorical exclusion (CAT-X) and FONSI were issued by the DOE/LAAO on January 23, 1996, and September 20, 1996, respectively, for proposed effluent reduction from NPDES outfalls targeted for elimination as a result of WSC Project activities and Outfall Reduction Program activities. Appendix V provides copies of the corresponding environmental assessments performed by the Laboratory.

5. NPDES PERMIT RE-APPLICATION OUTFALL CHARACTERIZATION AND CLASSIFICATION

Reference is made to Appendix F, which provides a listing of the 34 previously permitted outfalls and 13 proposed new outfalls, for which this NPDES Permit Re-Application is made. These 34 outfalls currently remain from the 117 outfalls previously permitted under the 1990 Permit Re-Application. The 47 (34 existing and 13 new) total outfalls are located at 14 technical areas spread over a 43 square mile area within Laboratory boundaries, and are arranged in numerical order by the category of discharge.

The LANL NPDES Permit has historically been administered through categorical classification of wastewater discharges. Currently, the 34 previously permitted outfalls and 13 new outfalls included in this re-application are grouped into the following seven discharge categories: Power Plant (001); Steam Plant (02A); Treated Cooling Water (03A); Non-Contact Cooling and Water Production Facilities (04A); High Explosives Wastewater Discharge (05A); the TA-46 SWSC Facility (13S); and, the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) (051).

The categorical approach to outfall classification assumes that within each outfall category, discharges are similar in chemical constituents. As discussed in Section 3.2, *Waste Stream Characterization Program and Waste Stream Corrections Project* above, beginning 1991, the Laboratory initiated the Waste Stream Characterization Program to identify, verify, and correctly characterize and permit all wastewater sources to discharging outfalls.

6. WASTE ACCEPTANCE, CHARACTERIZATION, AND CERTIFICATION PROGRAM

The Laboratory's Waste Acceptance, Characterization, and Certification Program requires any waste generator to properly identify and document the characterization of any solid, hazardous, radioactive, or mixed waste pursuant to the Laboratory Implementation Requirements (Lab-wide Standards). The Waste Profile Form (WPF) is used to provide a complete and concise description of the waste, including the details of the generating process. The WPF process provides generators with guidance to help make the determination of the waste's physical, chemical, and radiological characteristics with sufficient accuracy to permit proper segregation, treatment, and disposal according to the final treatment/disposal facility's WAC.

The Laboratory has developed WACs for the TA-50 RLWTF, TA-46 SWSC Facility, and TA-16 HEWTF. Waste Acceptance Criteria are based on NPDES effluent limits, New Mexico Water Quality Standards, Resource Conservation and Recovery Act (RCRA) Universal Treatment Standards, and/or other federal and state requirements. The treatment processes and the capacities of these facilities are also considered during the development of WACs.

Each Group or Division at the Laboratory that generates liquid waste is represented by a Waste Management Coordinator (WMC), the primary contact between the waste generators and the treatment/disposal facility. Each Laboratory Group must ensure that: (1) waste streams discharged into the TA-50 RLWTF, TA-46 SWSC Facility, or the TA-16 HEWTF are acceptable under the Laboratory's NPDES Permit; (2) operating personnel are familiar with pertinent administrative requirements, and waste management regulations; (3) the wastewater does not exceed the recommended limits set forth in the WAC for the TA-50 RLWTF, TA-46 SWSC Facility, or the TA-16 HEWTF; (4) listed hazardous wastes are not discharged into the TA-50 RLWTF, TA-46 SWSC Facility, and the TA-16 HEWTF; and (5) the treatment/disposal facility personnel are notified of any unusual or accidental discharges that may violate waste management regulations.

Waste Profile Forms (WPFs) are prepared by the WMCs as required for any new discharge to the aforementioned NPDES wastewater treatment facilities or their collection systems. Additionally, the Laboratory's Waste Acceptance, Characterization, and Certification Program requires that a WPF be prepared if an existing waste stream to these facilities significantly changes in quality or quantity. The waste generator is required to notify the Laboratory's ESH-18 Group of any significant changes in the waste streams. Appendix J provides a copy of the Laboratory's WPF.

7.0 LABORATORY'S NPDES PERMIT RE-APPLICATION PROJECT

Much of the information used in preparation of this Permit Re-Application was collected over a seven-year period from 1991 - 1998. In addition to the information collected during the period of 1991 - 1997 under the Laboratory's Waste Stream Characterization Program, WSC Project and the Outfall Reduction Program, a specific project was initiated in October, 1997, to implement several routine and non-routine activities to further characterize waste stream discharges at permitted outfalls. The project was entitled "Los Alamos National Laboratory's NPDES Permit Re-Application Project."

The NPDES Permit Re-Application Project was created in order to identify, implement, coordinate, and ensure the safe and timely completion of all work plan activities necessary to obtain and compile the required information for the 34 remaining and 13 new outfalls included in this NPDES Permit Re-Application. The Project framework was designed and implemented by the ESH-18 NPDES Permit Re-Application Team to ensure the integration and quality of all work performed.

General work plan activities included: (1) the administration of an outfall survey; (2) special sampling of effluent at outfalls for re-application-specific parameters in addition to the routine compliance sampling of permit-required constituents; (3) the performance of special flow studies at permitted outfalls; and, (4) the research, compilation, and integration of existing operational, management, and compliance data into a computer generated EPA re-application format. The Executive Summary from the management plan entitled *"Los Alamos National Laboratory NPDES Permit Re-Application Project Implementation Plan" is* provided as Appendix P. This Implementation Plan was prepared to document the methodology implemented to accomplish work plan activities. The performance of the noted work plan activities was intended to provide the means to achieve a single, integrated approach to compiling the data required by this re-application. A brief discussion of Project work plan activities and the Implementation Plan is provided below.

7.1 Outfall Surveys

The NPDES Permit Re-Application Team developed a survey form for each of the 34 outfalls to be included in the re-application. The survey form requested specific information from outfall owners required by the Form 2C portions of the application. In addition, the Team performed an in-depth review of all existing outfall information. The sources reviewed included:

- the Waste Stream Characterization Program and WSC Project database;
- 1990 Permit Re-Application documentation;
- existing outfall operations and maintenance manuals (O&M), logs, and records;
- NPDES Discharge Monitoring Reports (DMRs);
- compliance inspection reports;
- discharge non-compliance records and reports;
- topographical maps;
- chemical inventories;
- waste profile forms (WPFs);
- recorded flow data and frequency of discharge data;
- Material Safety Data Sheets (MSDSs);
- operational sampling data; and,
- Notices of Changed Conditions or Planned Changes previously submitted to EPA and NMED from 1990 to 1998. (Refer to Appendix Q for a listing of the applicable EPA/NMED Notices of Changed Conditions or Planned Changes).

In addition, a site visit was scheduled with each outfall owner. The purpose of the site visit was to provide the survey team with the opportunity to interview the outfall operator and view the process(es) which contribute to the outfall's waste stream. Other activities which were accomplished at the site visit included:

- verification of sources to outfall, including storm water;
- verification of outfall location using a hand held Global Positioning System (GPS) receiver;
- identification of all actual processes that contribute to the waste stream; and,
- identification of any future equipment or process changes or activities that may contribute discharge to the respective outfall.

Upon completion of the site visit, line drawings were developed denoting all contributing sources and treatment processes for the outfall. Data collected from the survey was also entered into an ACCESS database and used to complete the re-application forms. In addition, chemical treatment and discharge information obtained from the survey process was evaluated to determine the need for performing additional characterization activities such as sampling of discharges or performing a flow study.

7.2 Outfall Sampling

The analytical data required for Form 2C of the re-application was collected through an established sampling program in accordance with sampling procedures listed in 40 CFR 136 and also documented in the ESH-18-prepared *"Sampling Plan for Los Alamos National Laboratory's NPDES Permit Re-Application,"* revised April, 1998. This Plan, provided as Appendix R, addresses physical, chemical, environmental, radiological, and biological safety issues, provides guidance on the sampling methods, lists parameters for which samples were analyzed, and identifies the outfalls that were sampled and the requirements for records retention. The Laboratory reviewed the Sampling Plan with both EPA and NMED. EPA concurred with the re-application sampling regime presented by the Laboratory.

Data reflected in the Form 2C is a compilation of data produced from routine NPDES Permit compliance monitoring, and data produced from special sampling of outfalls for re-application-specific parameters. All sampling of effluents was conducted by staff from the ESH-18 NPDES Outfall Team. Analytical services and support for NPDES routine Permit compliance data was provided by the Laboratory's Chemical Science and Technology (CST) Division, Johnson Controls Northern New Mexico, and Quanterra. Analytical services and support for samples collected for re-application parameters was provided by Assaigai Analytical Laboratory, Johnson Controls Northern New Mexico, CST-9, IONICS International, American Radiation Services, Aquatech-Marion, and Acculabs.

The Laboratory uses groundwater for its potable water supply. Groundwater contains various levels of natural elements which are dissolved as water passes through the sub-surface geology. The Laboratory has sampled and analyzed water from the various existing wells and found variation in background elements by location. The variation increases as the water is distributed throughout the Laboratory; some outfalls show the persistence of the background metals (Al, As, etc.) and others show zero concentrations. The Laboratory did not attempt to conduct a study and to develop a set of chemical constituents for establishing standard background levels for intake water. Instead, we have provided chemical data from the results of the Laboratory's 1997 SDWA Sampling Program for well water in the Forms 2C and have summarized the outfall sampling data in the DMR summaries for each outfall. If a background element was not present in existing SDWA or DMR data, it was marked as "Believed Absent" in Form 2C . If the element was detectable, it was marked as "Believed Present" in the Form 2C.

The initial approach to sampling was to identify priority outfalls which are believed to be representative of the majority of outfalls, and at a minimum, one outfall from each outfall category. These "priority outfalls" which were sampled for the re-application are listed in Table 2 below. In instances where, through the outfall survey, outfalls were determined to not be "substantially identical" to the representative sample for that outfall category, additional sampling was conducted and analytical results were submitted with this Permit Re-Application. Outfalls sampled for this re-application are presented in the *Sampling Plan for Los Alamos National Laboratory's NPDES Permit Re-Application, revised April, 1998*, provided in Appendix R. The Laboratory provided EPA with this information at a meeting held on January 30, 1998.

The Laboratory performed a full scan for all Form 2C priority pollutants for a minimum of one outfall per NPDES outfall category. Information for priority pollutants analyzed were selected from a "knowledge of process" basis (i.e., knowledge of raw materials, maintenance of chemicals, intermediate and final products and by-products), and also from analytical data available for outfall effluents.

Also, the EPA Form 2C specifically requires the applicant to identify whether or not "Potential Contaminants of Concern" exist in outfall wastewater discharges. At a January 30, 1998, meeting with EPA Region 6 representatives, the Laboratory indicated that the Form 2C as currently formatted, did not address or require information regarding many contaminants that may be generated at the Laboratory. Potential for generation of these "other" contaminants arise from the Laboratory's diverse research and development programs and activities.

EPA representatives acknowledged this information and indicated that in the case where these "other potential contaminants of concern" were identified, that the Laboratory should document this information in summary form by the generic chemical name, and provide this information as an attachment or appendix to the relevant Form 2C. The Laboratory has provided the information in this re-application with the Form 2C as recommended by EPA.

As required by Form 2C, information obtained by re-application sampling efforts, process surveys, and historic compliance sample data from DMRs, was used to identify analytes that are "believed absent" from the particular outfall waste stream. The DMR data summaries for the Laboratory's NPDES Permit Re-Application were compiled by taking the data from DMRs for the period between August 1, 1994 through October 31, 1997. The data was entered into an EXCEL spreadsheet from which the necessary calculations were made. The tables are attached to the relevant Forms 2C and are entitled *DMR Outfall Summary (1994-1997)*. A copy of the compiled historical DMR sample data is provided for each of the 34 outfalls included in this re-application.

All the information noted above was used to identify and document outfalls that were "substantially identical" and sampled as priority outfalls for the re-application. Provided as Table 2 following, is a summary of the priority outfalls sampled.

Table 2, Priority Outfalls Sampled for the Re-Application

Outfall Category	**Outfall #**	**TA-BLDG**	**FMU**
Radioactive/ Industrial Effluent	051	50-1	84
Sanitary	13S	46-00	80
Power Plant	001	3-127	80
Steam Plant	02A129	21-357	80
Treated Cooling Water	03A022	3-66	73
LANSCE*	03A047	53-60	61
	03A048	53-62	61
	03A049	53-64	61
Non-Contact Cooling Water – Pajarito *	04A163	Pajarito Well #1	80
	04A164	Pajarito Well #2	80
	04A165	Pajarito Well #3	80
	04A166	Pajarito Well #4	80
Guaje	04A176	Guaje Well #6	80
Otowi	04A161	Otowi Well #1	80
High Explosives Wastewater	05A055	16-401, 406	70
	05A097	11-52	70

* Only one of the indicated outfalls will be sampled

Instructions provided in Form 2C of the re-application for sampling specify the requirements for sample collection, (i.e., whether a sample must be collected as a composite sample or grab sample depending on the parameter being sampled). In addition to sampling the "priority" outfalls, an evaluation was made of all 34 outfalls for the potential for sampling pursuant to these instructions. Findings from this evaluation indicated that some outfalls could not be sampled in strict adherence to the prescribed instructions due to the following reasons: some outfalls do not have an active discharge to sample due to seasonal operations or inactive operations, and one permitted outfall has not yet been constructed, or there were operational limitations on the duration and volume of discharges.

Form 2C instructions allow for some flexibility with this regard. The instructions state: "The Director may waive composite sampling for any outfall for which you demonstrate that use of an automatic sampler is infeasible and that a minimum of four grab samples will be representative of your discharge." A verbal request was made by the Laboratory in December, 1997, to EPA Region 6 for such a waiver for those outfalls where composite sampling was infeasible. Approval was granted by EPA. On January 30, 1998, EPA also provided verbal approval to the Laboratory allowing the collection of one grab sample in lieu of four grab samples for intermittent and batch discharges. The method of sample collection, "grab" versus "composite" is noted as required on the Form 2C application form.

Sampling personnel implemented quality assurance/quality control (QA/QC) procedures for sample collection, sample preservation, and field analysis, as required by the NPDES Permit or the noted NPDES Permit Re-Application Sampling Plan. The methodology for samples collected in compliance with monitoring requirements for the existing NPDES Permit require that collection occur following final treatment, prior to or at the point of discharge as documented in Part II of the Laboratory's NPDES Permit. All samples were handled in accordance with chain-of-custody procedures established by the individual laboratories that analyze samples (LANL 1994a). These QA/QC activities are detailed in the various Laboratory and internal Group procedures and quality assurance plans.

7.2.1 Sample Analysis

All analytical laboratories that were responsible for the analysis of re-application samples were required to have established QA/QC programs, in accordance with NPDES Permit requirements.

All data provided by analytical laboratories was evaluated for accuracy and input into an ACCESS database. The database was used to populate the analytical portion (Section III) of the Form 2C Permit application with the applicable data.

On January 30, 1998, a verbal request was made by the Laboratory to the EPA Region 6 Permit Writer for approval for the use of EPA Methods 300.0 and 200.8 by Assaigai Analytical Laboratories for the analysis of samples submitted for NPDES Permit Re-Application purposes. EPA Method 300.0 is "The Determination of Inorganic Anions in Water by Ionic Chromatography. EPA Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma Mass Spectrometry," is a method used for the analysis of cadmium and lead in wastewater samples.

On February 4, 1998, the Laboratory received an EPA letter approving the Laboratory's request to use EPA Method 200.8 for the measurement of cadmium and lead for permit and permit re-application purposes. In addition, on March 6, 1998, the EPA Permit Writer provided approval to the Laboratory regarding use of EPA Method 300.0 by the Laboratory as an alternative analytical method for NPDES Permit and Re-Application purposes. Follow-up written documentation was transmitted from the Laboratory to EPA Region 6 summarizing the aforementioned requests and approvals. (Refer to Appendix S, for miscellaneous correspondence regarding requests to EPA for approval regarding use of alternative analytical methods)

7.2.2 Quality Assurance/Quality Control

The Laboratory has implemented a Laboratory-wide QA/QC Program (LANL 1993a) in accordance with 10 CFR 830.120 (DOE 1991) and Director's Policy 110 (LANL 1991). Additionally, Laboratory environmental QA/QC programs are required to meet the requirements of DOE Order 5400.1 (DOE 1990a).

All data collected during the NPDES Permit Re-Application Project was subjected to a quality assurance review. Two types of quality assurance reviews were conducted. The first type was to ensure the accuracy of the data itself. The second type was to ensure the accuracy of data entry into the permit re-application forms. Also, a QA/QC review was performed by all chemical analytical laboratories consistent with NPDES Permit requirements. Selected data practices were also reviewed by the Laboratory's Inorganic Trace Analysis Group (CST-9). Prior to input of information to re-application forms, the NPDES Permit Re-Application Team reviewed analytical data for completeness and conformance to NPDES analytical requirements.

Quality assurance review for data accuracy was conducted to ensure that data collected during outfall surveys, flow studies, and sampling activities are reasonable and the data source are adequately documented. This QA review was initially conducted on an on-going basis as data was collected. Re-Application Project Team members reviewed data as it was gathered and reported by analytical laboratories. Questionable or undocumented data initiated additional investigations with outfall owners/operators and in some cases required additional field investigations, flow studies or re-sampling activities. In addition, to ensure accuracy, all collected or compiled data was compared and evaluated against existing data obtained from other internal and external entities.

7.3 Flow Study

In instances where outfall operators are not required to meter their discharge or where actual flow rate data from facility records is not available, a flow study was required to obtain actual flow data or estimates of flow rates based on Best Professional Judgment (BPJ). The goal of the flow study was to obtain:

- the frequency of discharge from the outfall;
- daily average and daily maximum flow rates from the outfall; and,
- flow rates from all operations which contribute discharge to the outfall.

The level of effort and activities necessary for conducting a flow study on an outfall was dependent on the type and quality of the flow data received via the survey effort. Following completion of the survey, each of the outfalls was evaluated and assigned as either categories, A, B, C, or D. Following is a summary defining each of the flow categories and a listing of the necessary activities specific to each.

A = Outfall with existing flow metering with reliable historical data available:

- Review existing records and determine peak and average flows.
- Continue monitoring during survey phase and incorporate information into application.

B = Outfalls with existing flow metering with questionable historical data:

- Initiate new flow monitoring utilizing existing metering.
- Obtain reliable data.

C = Outfalls with no existing metering that can be monitored using ESH-18 flow measuring equipment:

- Review previous applications and flow monitoring data on DMRs.
- Coordinate work with ESH-18 outfall survey and storm water monitoring teams to install temporary monitoring/metering equipment at these outfalls.
- Obtain reliable data to determine required peaks and average flows.

D = Outfalls with no existing metering that cannot be monitored using ESH-18 flow measuring equipment:

- Review previous application and flow monitoring data from DMRs.
- Determination of required peak and average flows were made by calculations utilizing generally accepted engineering methods.
- Calculations were documented and crosschecked.

The devices and methods chosen for measuring flow were consistent with accepted engineering practices and were used to ensure the accuracy and reliability of measured discharge volume. The flow measurement devices were able to measure flow with a maximum deviation of less than 5% from true discharge rates throughout the range of expected discharge volumes. Where outfalls were discharging as part of normal operations, real time monitoring of the outfall was used to determine flow rates.

A Parshall flume or a V-notch weir was used to measure flow at each Category C outfall where flow was present. Twenty-four hour flow recorders were installed on the flume or weir to measure instantaneous and total flow. The total flow was divided by the total time monitored in order to obtain the average flow rate. The maximum daily flow rate was determined by taking the largest cumulative flow over the associated twenty-four hour period. Some outfalls were monitored for a two-week period. (Refer to Appendix R, for more specific details regarding outfall sampling methodology.)

In some cases, actual monitoring of flow was not possible because some outfalls operate seasonally. For example, many cooling towers will operate only during the warmer months. Where historical data was not available and flow monitoring was not possible, flow estimates were based on BPJ. These estimates in some cases were also based on available data from "substantially identical" outfalls, the review of manufacture equipment design documentation to determine flow rates for the process in question, or data which may allow for water balance calculations.

7.4 Data Integration

All NPDES Permit Re-Application forms have been recreated as "Reports" by using Microsoft ACCESS, Version 7.0 software. Computer generation of the EPA forms allowed for automated data entry, and also ensured accuracy and completeness. The forms were reviewed by a quality assurance specialist for conformance to the "original" forms as downloaded from the internet at the address following (www.epa.gov/earth1r6/6wq/npdes/forms/forms.htm). Prior to including these recreated forms in the final submittal, EPA approval authorizing their use was requested by the Laboratory.

On January 30, 1998, the EPA Region 6 Permit Writer was provided with copies of the recreated forms. A request for approval to use these recreated forms in lieu of those provided on the internet was made. At the January 30, 1998 meeting, approval was granted by the EPA Region 6 Permit Writer.

Another record keeping and documentation objective of the Laboratory's NPDES Permit Re-Application Project was to produce data of known, documented quality for inclusion in this NPDES Permit Re-Application. This supporting documentation was obtained by survey, flow study and sampling/analysis activities for each outfall. Other sources of information included:

- operating logs and/or operational sampling data obtained from outfall operators;
- compliance inspection documents from previous three years;
- field notes from survey site visits and process of knowledge interviews;

- process flow diagrams;
- chemical inventories;
- WPFs;
- a map denoting outfall location relative to discharging structure;
- photos of the outfall;
- sampling and analysis documentation;
- flow study logs or calculations;
- MSDS sheets for chemicals included in waste streams;
- DMR Summaries;
- previously submitted Notices of Changed Conditions or Planned Changes;
- Waste Stream Characterization Survey Reports;
- SDWA data from the Laboratory's 1997 sampling efforts; and
- any other documents that were determined to be relevant to renewal of the Permit.

Outfall survey form data, flow study monitoring data, and analytical data were all captured in a ACCESS database that was used to re-create and complete the application forms required for renewal of the Permit. Use of the database enabled automation of the application's completion and should have ensured consistency of responses.

The Laboratory used the Microsoft ACCESS software to integrate and report the data on the NPDES application forms. All data which was included into a database was automatically and directly imported into the NPDES application tables and form(s) using update queries.

7.5 NPDES Permit Re-Application Project Implementation Plan

The objective of the *LANL NPDES Permit Re-Application Project Implementation Plan* was to document how the UC, DOE, and the Laboratory developed, implemented and managed work plan activities set forth under the Laboratory's NPDES Permit Re-Application Project.

The Implementation Plan was developed as a management tool or "roadmap" to define, document, and direct the Project objectives, summarize organization responsibilities, work plan activities, safety and training requirements, and cost and schedule for compilation of this Permit Re-Application document and future re-application submittals. See Appendix P for a copy of the Executive Summary from the Laboratory's NPDES Permit Re-Application Project Implementation Plan (dated March 11, 1998).

8. NPDES PERMIT RE-APPLICATION FORMS

The NPDES Permit Re-Application requires detailed information be provided for each point source outfall. The information required includes the location of the outfall, a detailed description of all sources and processes that contribute to the discharged waste stream, the volume and frequency of the discharge, and analytical data on the waste stream. A "fact sheet" which provides a brief biography of the required information has been created and provided for each Form 2C for each of the existing 34 outfalls included in this re-application.

8.1 General Form 1

Form 1 is used to present general information such as the nature of business, name, mailing address, location, and existing permit numbers regarding EPA programs that apply to LANL.

The information to be contained in this form did not vary significantly from that which was provided in the 1990 re-application. The most notable change from the 1990 permit re-application is the December 29, 1997, approval by EPA to discontinue the Laboratory's Permit No. NM0028576 for the TA-57 Fenton Hill Geothermal Site.

The greatest effort required to complete this portion of the application was in generating an updated topographical map of the facility. The Laboratory's Ecology Group (ESH-20) and Facility for Information, Management, Analysis, and Display Group (FIMAD) assisted ESH-18 in preparing this map. The requirements for the map include, but are not limited to:

- denoting legal boundaries of facility and extending at least one mile past these boundaries;
- location and serial number of each intake/discharge structure;
- location of hazardous waste management facilities; and,
- springs, surface water bodies, and drinking water wells.

Appendix F provides a topographical map of the Laboratory which denotes the legal boundaries within at least one mile past the exterior boundary. This map also provides the locations of the 34 outfalls to remain on the Laboratory's NPDES Permit. Also included in this map are the locations of the Laboratory's production wells (intake structures) which are denoted with an 04A category designation.

Refer to Appendix T for copies of the 12 hazardous waste management facilities located at the Laboratory. Also provided in Appendix T is a listing of the relevant hazardous waste treatment process codes denoted on the maps provided. Appendix B provides a topographical map which depicts all springs and surface water bodies located within the area of the Laboratory.

Section VI of Application Form 1 - General Information also requests information regarding "prevention of significant deterioration permits under the Clean Air Act (CAA)." The Laboratory is currently undergoing review and approval by the NMED Air Quality Bureau for the Title V Operating Permit Application. The Application and anticipated permit will place federally enforceable limits on criteria pollutant emissions from the Laboratory regulated under the CAA well below 250 tons per year.

Section VII of the Application Form 1 - General Information also requests the appropriate 4-digit Standard Industrial Classification (SIC) Codes which best describe the facility in terms of the principal products or services it produces or provides, or the activities covered by the permit re-application. SIC Codes provided in this re-application for the Laboratory include: 9711 - National Security, 9661- Space Research and Technology, 9922 - Scientific Research, and 9611 - Energy Development. The noted SIC Codes were confirmed via use of the *"Standard Industrial Classification Manual"* published 1987 by Superintendent of Documents, U. S. Government Printing Office., Washington, D. C.

Section X, of the Application Form 1 - General Information also requires that all existing environmental permits be noted. Currently at the Laboratory, in addition to NPDES Industrial Permit No. NM0028355, the Laboratory has an existing permit for its storm water discharges, a permit for generation and treatment of hazardous wastes, an application submitted for air emissions from proposed sources, and several Dredge and Fill Permits granted by the U.S. Army Corps of Engineers (COE) under Section 404 of the CWA. Following is a brief description of each.

Regarding storm water discharges, the Laboratory currently has one NPDES Baseline General Permit for Industrial Activities, and six NPDES Baseline General Permits for Construction Activities. The NPDES Storm Water Baseline General Permit for Industrial Activity expired on September 9, 1997, and under EPA guidance the Laboratory has applied for an extension of the Baseline General Permit until the modified Multi-Sector General Permit is published by EPA. SIC Codes provided for the storm water permit re-application in 1992 included: 9711 - National Defense R&D; 9661 - Space Research and

Technology; 9922 - Scientific Research; and, 9611 - Energy Development. The Laboratory has received coverage under the Character Codes of: HZ for hazardous waste treatment, storage, or disposal facilities; LF for landfills, land application and open dumps; SE for steam electric power generating facilities; and, SIC Code 4581 for airports, flying fields, and airport terminal services.

The Laboratory also generates a variety of hazardous wastes, most of which are produced in small quantities. On November 8, 1989, the DOE and UC were issued a Hazardous Waste Facility RCRA Part A Permit (No. NM0890010515-1) by the NMED. The 10 year Permit expires in November, 1999, and the Laboratory must submit the application for renewal six months in advance. The Laboratory also submitted a proposed General Part B Application to the Hazardous and Radioactive Materials Bureau of NMED in August, 1996.

The Laboratory is currently undergoing review and approval by the NMED Air Quality Bureau for the Title V Operating Permit Application. The Application and anticipated permit will place federally enforceable limits on criteria pollutant emissions regulated under the CAA. To-date, the NMED has not assigned an air permit number to the Laboratory's request.

The Laboratory currently has eight active and one pending 404/401 Dredge and Fill Permits. These Permits are issued by the COE and certified for water quality by the Nonpoint Source Section of the Surface Water Quality Bureau of the NMED under Section 401 of the CWA. The nine Permits are associated with several activities including: maintenance and/or improvements to existing structures; construction of new projects; wetland or stream restoration; and, watershed monitoring and sampling activities. Refer to Appendix X for a listing of the nine 404/401 Dredge and Fill Permits.

8.2 Standard Form A Preparation

Standard Form A is the section of the application used for documenting discharges from a publicly or privately owned activity or wastewater treatment system or facility. The Laboratory does not own or operate a municipal wastewater system or POTW.

On February 2, 1998, the EPA Region 6 Permit Writer indicated that the Laboratory *would not* be required to submit a Standard Form A with submitted permit re-application materials. However, it was agreed by both the Laboratory and EPA, that a copy of the Laboratory's Sludge O&M Plan for the TA-46 SWSC Facility should be provided. Please see Appendix M for a copy of the Laboratory's plans entitled *"Administrative Procedure LANL-ESH-18-602, Handling Disposal, and Reuse of Sanitary Treatment Solids,"* and Draft *"Interim Management Procedures for SWSC Facility Sanitary Solids."*

8.3 Form 2C Preparation

Form 2C is the section of the application used for renewal of expiring NPDES industrial permits. Form 2C requires detailed information on location of outfalls, sources of intake water, production levels, and detailed testing data for pollutants contained in effluent. The items required to complete the Form 2C included:

- location of each outfall (latitude/longitude);
- a line drawing showing all outfall sources, operations, and discharge locations;
- physical characterization of a discharge including a description of all wastewater sources and flow estimates associated with the outfall discharge;
- a description of the discharge frequency;
- a description of any effluent guidelines for the discharge; and,
- chemical characterization of the discharged waste stream.

To enable compilation of the required data for the 34 existing outfalls included in this re-application, a comprehensive physical and chemical "characterization" of each outfall discharge was conducted to ensure that the most up-to-date information was provided in the enclosed Forms 2C. This "characterization" consisted of a survey of the outfall, a flow study to accurately determine or measure flow values, and special sampling and analysis of outfall effluent for specific re-application parameters. A data research effort to summarize pre-existing NPDES Permit compliance data (from DMRs) and radiochemical data was performed to provide comparison data.

In addition to the Form 2C, miscellaneous supporting documentation is provided for each existing outfall. The supporting document includes:

- a Fact Sheet which provides a brief overview of information relative to each outfall;
- an outfall process flow diagram which depicts chemical treatment and flow information;
- outfall MSDS sheets which provide chemical inventory information for each discharge;
- outfall location map, which illustrates where the outfall is currently located at Laboratory technical areas and buildings; and,
- an updated NOI was prepared for each of the 34 outfalls per State of New Mexico Ground and Surface Water Quality Protection Regulations (20 NMAC 6.2. Refer to Appendix U for copies of NOIs previously submitted to NMED.

8.4 Form 2D Preparation

Form 2D is used for new applications for NPDES industrial wastewater permits. Form 2D required less data than Form 2C. The activities required to complete this form include:

- location of each outfall (latitude/longitude);
- a line drawing showing all sources, operations and discharge locations associated with the outfall;
- physical characterization of a discharge including: a description of all wastewater sources, including storm water and flow estimates associated with the outfall discharge;
- a description of the discharge frequency;
- date discharge is expected to begin; and,
- chemical characterization of the discharged waste stream.

On January 30, 1998, at a meeting with EPA Region 6 representatives, the Laboratory requested clarification regarding NPDES permitting requirements for mechanical equipment discharges to floor drains from water supply facilities. Currently, the floor drains can receive intermittent flows of bearing cooling water during pump operation and from leaks from potable water pipes, sand samplers, and pumps. These discharges do not include the larger blowdown flows from the well pumps. The larger blowdown flows are piped separately from these floor drains and are presently covered under the Laboratory's NPDES Permit (Category 04A Outfalls). The make-up of the bearing cooling water is the same as the larger blowdown flows. The EPA stated they will require that Form 2Ds be submitted for the floor drain discharges. The Laboratory has prepared and provided Form 2Ds in this re-application for these flows as directed. Additionally, information regarding the bearing cooling water discharges to floor drains has previously been submitted to the NMED in an NOI.

Form 2Ds are submitted in this re-application for 13 discharges. The 13 outfall discharges included in this re-application are as follows:

1. Four outfalls associated with the Guaje Well Replacement Project (Outfalls 04A187, 04A188, 04A189, and 04A190). The Form 2Ds have been previously submitted (December 12, 1996) for these discharges, and are again being re-submitted so they will be considered during this re-application process.

2. One outfall associated with the Omega Site (TA-2-1) basement sump discharge. Although a Form 2D was previously submitted (July 12, 1993) for this groundwater discharge, a copy will again be provided for reference and potential inclusion into the Laboratory's NPDES Permit.

3. Eight outfalls with bearing cooling water discharges to floor drains at potable water well houses. The Laboratory is evaluating re-engineering options in order to eliminate these discharges to the environment.

In addition to submittal of the EPA Form 2D, per State of New Mexico Ground and Surface Water Quality Protection Regulations (20 NMAC 6.2), an updated NOI has been prepared and provided for each outfall included in the re-application with a corresponding Form 2D. Please see Appendix U for copies of NOIs previously submitted to NMED.

9. SUMMARY

The required and supplemental information contained in this re-application is provided to assist the EPA Permit Writer in the development of an NPDES industrial wastewater discharge permit for the Laboratory.

The information provided in this re-application document represents the best information available to the applicants at the present time. The Laboratory is aware that additional information may be requested and will provide it to the requester if available.

In January, 1998, Laboratory staff extended an invitation to the assigned EPA Permit Writer to visit the Laboratory site. The Laboratory believes a site visit in addition to the information provided herein, would assist the Permit Writer in becoming better acquainted with the Laboratory's diverse facilities, operations, and industrial wastewater discharge activities.

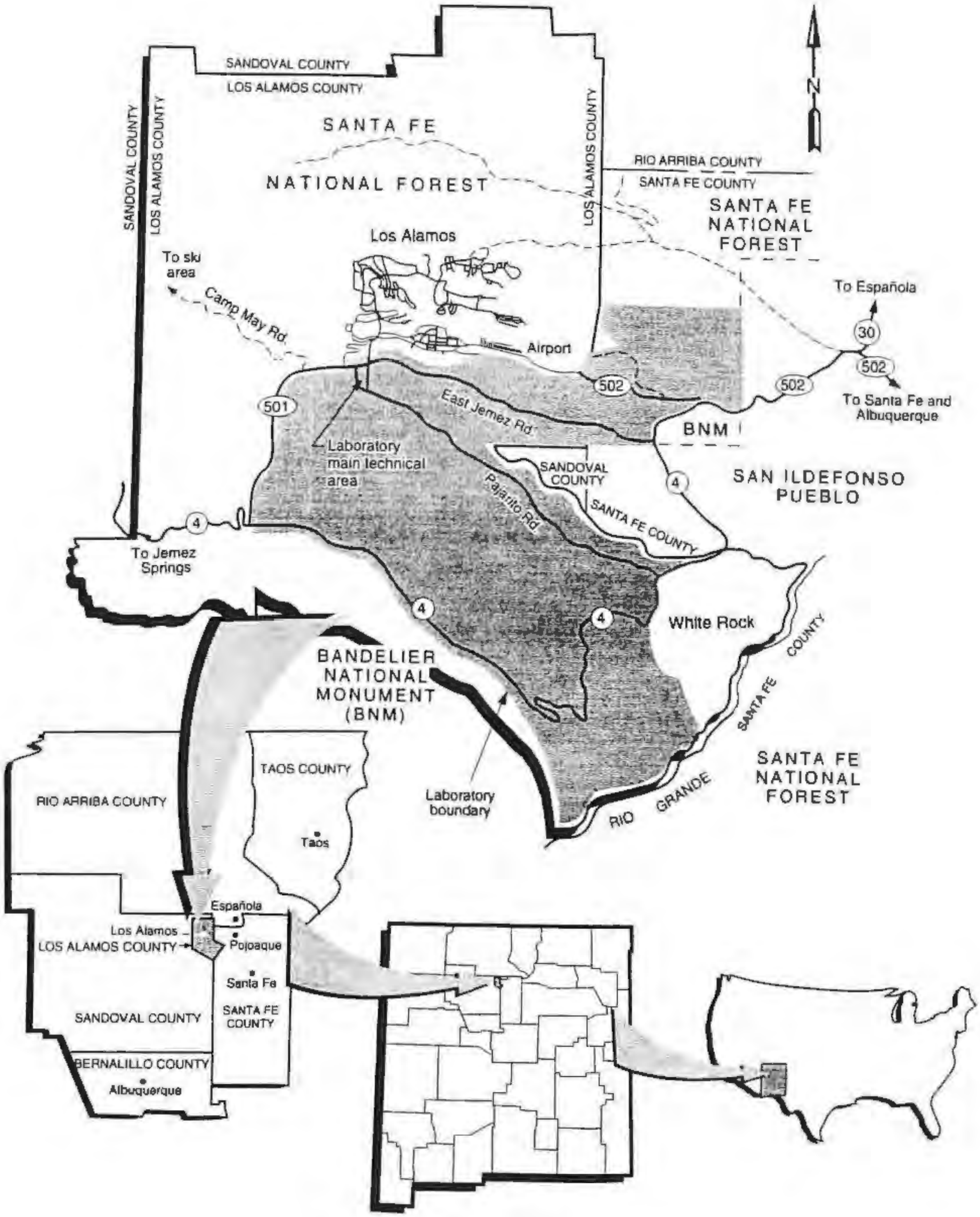

Figure 1. Regional Location of Los Alamos National Laboratory

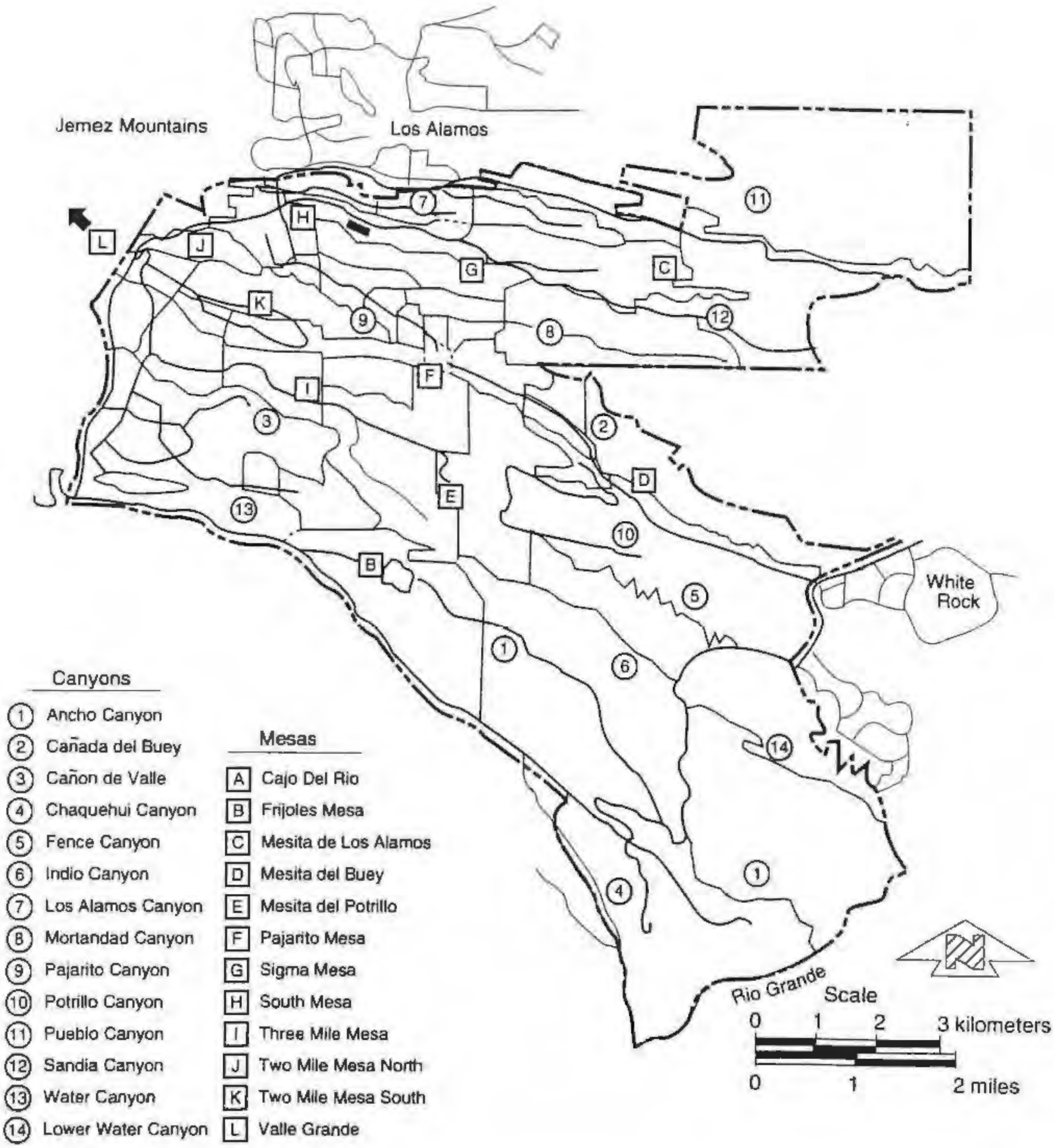

Figure 2. Major Canyons and Mesas.

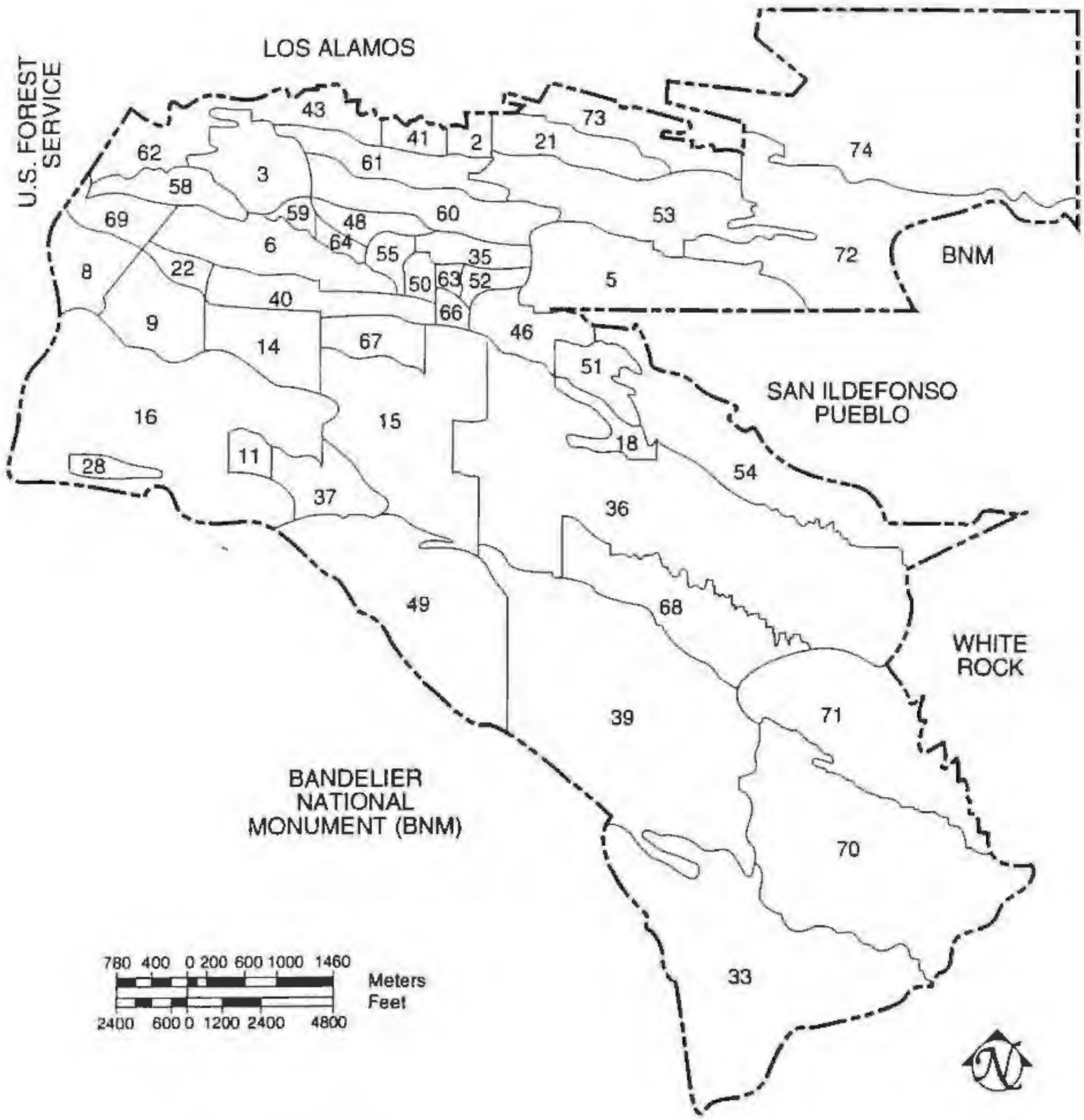

Figure 3. Technical Areas of Los Alamos National Laboratory in Relation to Surrounding Landholdings.

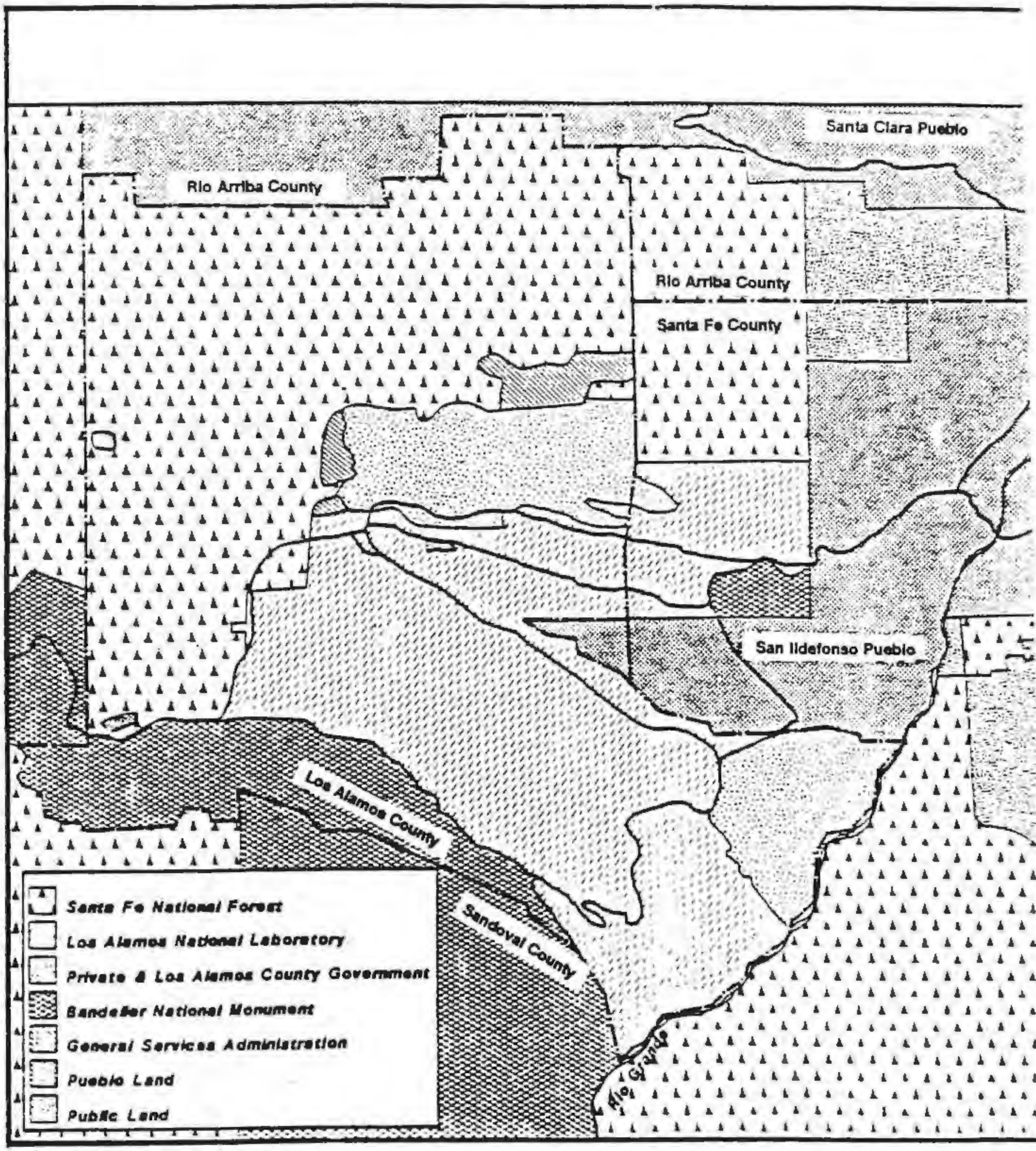

FIGURE 4

LOS ALAMOS COUNTY LAND OWNERSHIP

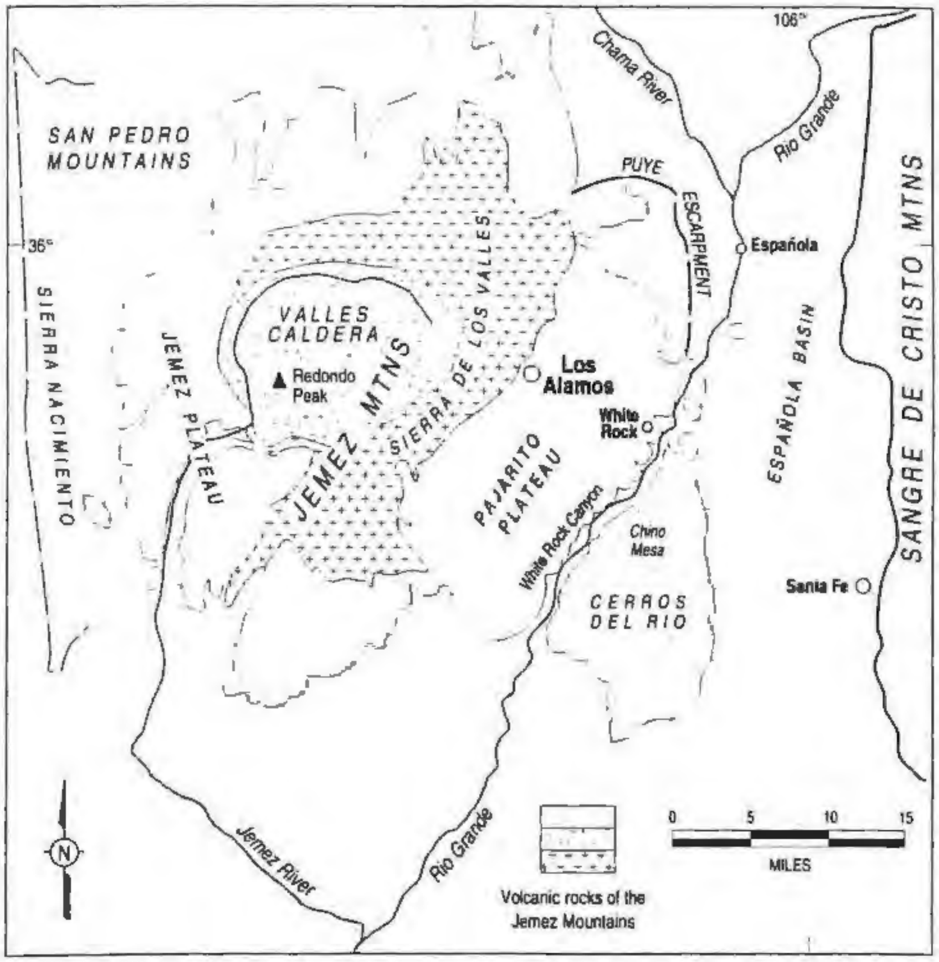

Figure 5. Location Map Showing Geologic and Topographic Features near Los Alamos and the Pajarito Plateau.

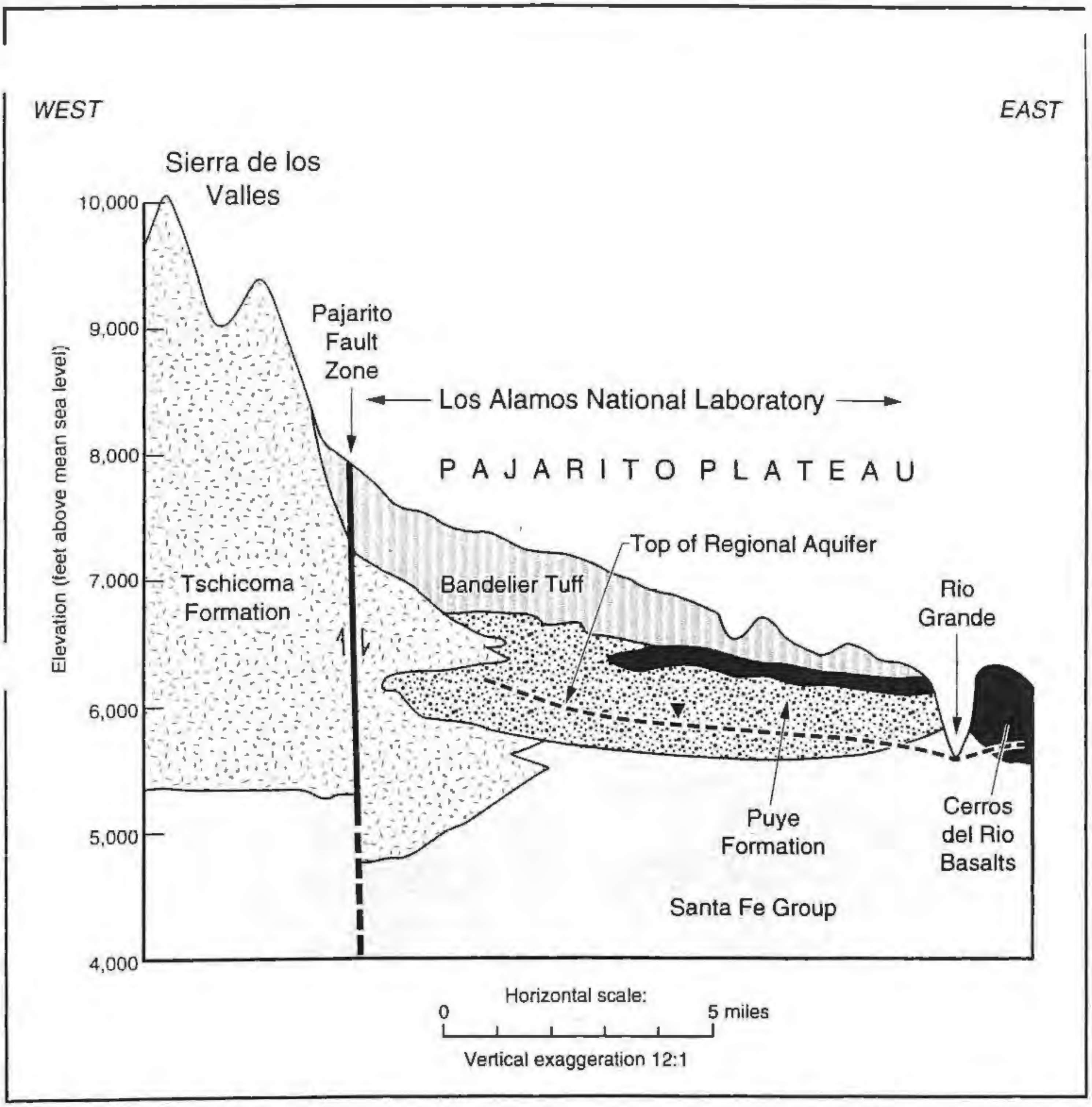

Figure 6. Generalized Geologic Cross Section across the Pajarito Plateau.

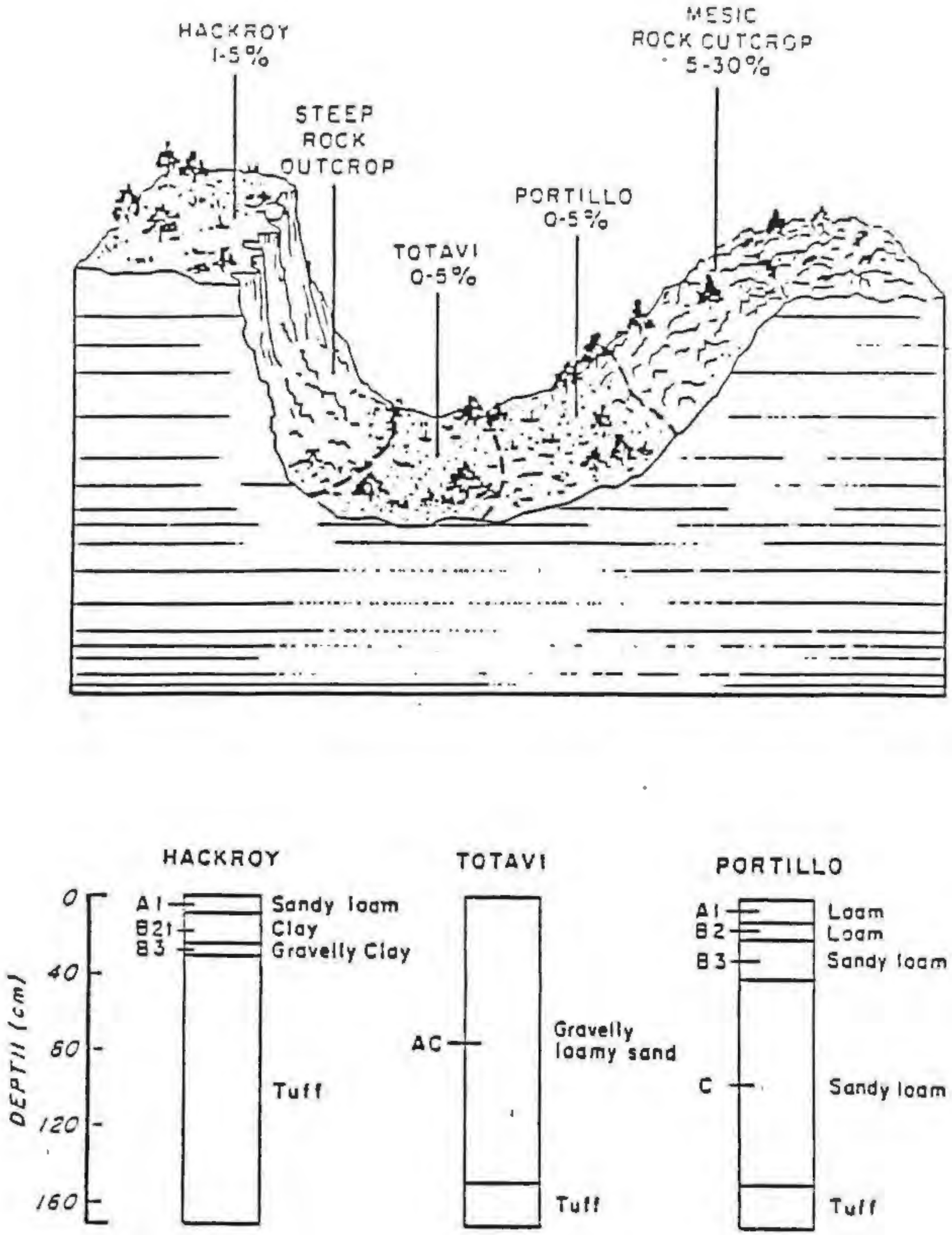

FIGURE 7

RELATIONSHIPS OF SLOPE, VEGETATION,
AND PARENT MATERIAL
TO HACKROY, TOTAVI, AND PORTILLO SOILS

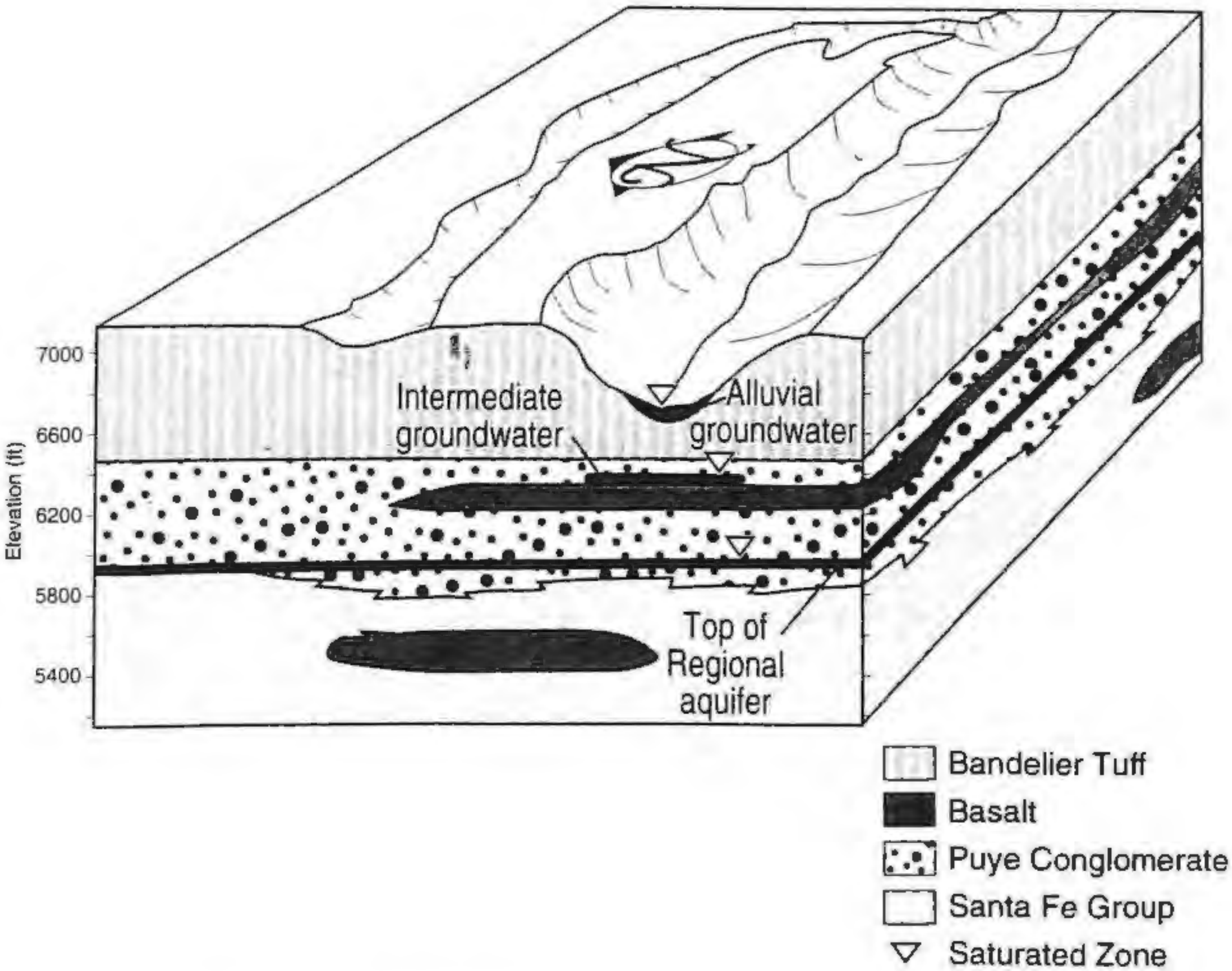

Figure 8. Illustration of Geologic and Hydrologic Relationships in the Los Alamos Area, Showing theThree Modes of Groundwater Occurrence.

EXHIBIT

Y

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: March 10, 1999
In Reply Refer To: ESH-18/WQ&H:99-0072
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Glenn Saums
New Mexico Environment Department
Surface Water Quality Bureau
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502

MAR 10 1999

SUBJECT: NPDES PERMIT RE-APPLICATION (NM0028355) RESPONSE TO NMED/SWQB REVIEW COMMENTS

Dear Mr. Saums:

Staff from the Laboratory's Water Quality and Hydrology Group (ESH-18) have completed a review of the comments provided by the New Mexico Environment Department, Surface Water Quality Bureau (NMED-SWQB), in your letter dated February 2, 1999 (Attachment 1), regarding the Laboratory's NPDES Permit Re-Application. Enclosed is the Laboratory's detailed response to the NMED-SWQB's questions and requests for information.

The NPDES Permit Application Instructions provided by the U.S. Environmental Protection Agency (EPA) are very specific regarding the information requested and the format in which the information must be provided in the Permit Re-Application. In accordance with these instructions, the Laboratory prepared a very comprehensive and detailed Re-Application document which is contained in three large notebooks. The Laboratory received a letter dated August 31, 1998, from the EPA indicating that the Laboratory's Re-Application for an NPDES Permit had been received, reviewed, and had been determined to be "administratively complete" in accordance with the EPA's Environmental Permit Regulations (Attachment 2).

The enclosed response addresses each of the comments in your February 2, 1999 letter and should be helpful in completing your review of the Laboratory's Re-Application. Individual responses were developed in order to provide additional information or to identify the location of information previously provided in the Laboratory's NPDES Permit Re-Application document and in follow-up supplements. Fourteen additional documents are also enclosed for your review. (Please see the Listing of Enclosures)

RESPONSE TO NMED-SWQB REVIEW OF COMMENTS NPDES PERMIT RE-APPLICATION (NM0028355)

LISTING OF ENCLOSURES

Enclosure 1: Master List of Permitted Septic Systems (Updated Appendix O, March 10, 1999)

Enclosure 2: Sanitary Utility Mapping (Updated Appendix L, February 25, 1999)

Enclosure 3: Listing of Discharge Sources to the TA-21 Transfer Station

Enclosure 4: Listing of RCRA-Permitted and Interim Status Sites

Enclosure 5: Engineering Schematics of TA-46 SWSC Effluent Holding Pond (Structure 346 and 349) and Effluent Holding Pond, Overflow Control Box Plan and Section (Structure 346)

Enclosure 6: Waste Acceptance Criteria (WAC) for the TA-16 HEWTF

Enclosure 7: December 22, 1998, letter from Chris Ortega, Utility Manager, Los Alamos County, to William B. Hathaway, Director, EPA Region 6

Enclosure 8: January 11, 1999, letter from Jack V. Ferguson, P.E., Chief, NPDES Permits Branch, EPA Region 6, to David Gurule, Area Manager, DOE Los Alamos

Enclosure 9: February 22, 1999, letter (LAAME:3JV-017) from Joseph C. Vozella, Assistant Area Manger, Office of the Environment, DOE Los Alamos, to Joseph C. King, County Administrator, Incorporated County of Los Alamos

Enclosure 10: 1996 Ground Water Discharge Plan (DP-1052) Report for the Land Application of Sanitary Sludge

Enclosure 11: 1997 Ground Water Discharge Plan (DP-1052) Report for the Land Application of Sanitary Sludge

Enclosure 12: 1998 Ground Water Discharge Plan (DP-1052) Report for the Land Application of Sanitary Sludge

Enclosure 13: Testing Results of Sludge, Grit, and Screenings for 1997 and 1998

Enclosure 14: May 22, 1998, letter (LAAME:6BK-010) from Joseph C. Vozella, Assistant Manager, Office of the Environment, DOE Los Alamos, to Robert S. (Stu) Dinwiddie, Ph.D., Manager, RCRA Permits Management Program, New Mexico Environment Department

RESPONSE TO NMED-SWQB REVIEW COMMENTS
NPDES PERMIT RE-APPLICATION (NM0028355)

1. Septic Tanks/Holding Tanks and Sumps

- Appendix O contains a list of Septic/Holding Tanks. However, it is not clear whether this list is complete. (e.g. no sumps are included). Appendix O also does not identify the exact location or number of the septic/holding tanks and sumps, nor does it contain the pumping schedule associated with these structures. In addition, a discussion concerning the relevance (e.g. do the tanks, sumps, and TA-21 meet the WAC for volume pumped and constituents of concern such as hazard and radioactive waste) and rationale for continuing to use these septic/holding tanks, and sumps. Also, a description of how they relate to the SWSC plant would be helpful.

  Provided as Enclosure 1 is the current list of septic/holding tanks at the Laboratory. We have also included a new septic/holding tank map (Enclosure 2). Many buildings at the Laboratory have small sump/lift stations connected to the SWSC collection system and are not individually listed in Appendix O of the Laboratory's NPDES Re-Application, as permitting is not required for this ancillary equipment. All sanitary septic/holding tanks were listed in Appendix O and categorized by Technical Areas (TA) and structure number. The septic/holding tanks are checked regularly and are pumped on an as-needed basis. The daily flow rate from the septic/holding tanks is 331 gallons per day and was provided in the NPDES Permit Re-Application Supplement 2, dated January 20, 1999. Additionally, individual septic/holding tanks have been permitted under the New Mexico Liquid Waste Disposal Regulations (20 NMAC 7.3). Pumping records for holding tanks are submitted to NMED District II once every six months. The Laboratory will add NMED-SWQB to the distribution list upon request.

  All sanitary septic tank owners must complete a Waste Profile Form (WPF) and the waste be approved pursuant to the Waste Acceptance Criteria (WAC) for treatment at the TA-46 SWSC Plant. These requirements and guidance are outlined in the Laboratory's Implementation Requirement (LIR 404-00-01.2) and Laboratory Implementing Guidance Document (LIG 404-00-03.0). These documents were hand delivered to NMED-SWQB on February 9, 1999, under Supplement 2 of the NPDES Permit Re-Application.

- TA-21, an old wastewater treatment plant, is being used as a holding tank, but is not listed in Appendix O. Does this omission indicate that the use of TA-21 will be terminated? If it was meant to be included as part of the application, please include a discussion of its intended use (e.g., list buildings discharging to TA-21). Also, list appropriate information about it on the Appendix O and Appendix L maps.

  The old TA-21 Sewage Treatment Plant (NPDES Outfall 05S) is referred to as the 'TA-21 Transfer Station" on the Laboratory's revised septic/holding tank map. The TA-21 Transfer Station will continue to be used until demolition activities at TA-21 are completed. In a telephone conversation on February 19, 1999, Mr. Courte Voorhees, NMED District II, indicated that as long as this structure is part of the

SWSC collection system, permitting as a septic tank or holding tank was not necessary. Additionally, Mr. Voorhees indicated that this structure represented a transfer station and he did not consider it a septic or holding tank. Therefore, Appendix O of the Laboratory's NPDES Permit Re-Application which lists active and inactive septic and holding tanks at the Laboratory did not include the TA-21 Transfer Station.

Facilities at the TA-21 DP Site have been closed and are undergoing decontamination and decommissioning with the exception of a few isolated buildings. A map and list of buildings currently occupied and discharging to the TA-21 Transfer Station is provided as Enclosure 3.

- The Appendix L map does not reflect the location of the 48 septic/holding tank, 42 lift stations, and sumps. This information would be helpful. Also, this map (Appendix L) still indicates TA-21 as an operational wastewater treatment plant. Please include the current status of TA-21 on the map.

  Enclosed is a copy of the revised list of septic/holding tanks at the Laboratory (Enclosure 1). The list includes TA and structure number. We have also included a new septic/holding tank map (Enclosure 2).

- Identify all sumps associated with outfalls that receive storm water.

  NPDES outfalls that receive storm water are listed in Appendix C of the Laboratory's NPDES Permit Re-Application. Additionally, storm water contributions were included on the Form 2C and 2D, if applicable. Additionally, on May 23, 1996, the Laboratory submitted a Notice of Planned Change for NPDES Outfalls 05A053, 05A058, 05A066, 05A067, and 05A068, regarding the plugging of the high explosives (HE) sumps. The notifcation documented that only storm water from roof drains would continue to discharge through the eliminated HE outfalls. A copy of this notification was provided to NMED-SWQB and also included in the NPDES Permit Re-Application.

2. Flow and Impact to RCRA (PRS's)

- Please include on the revised map of the outfalls (Appendix F), all SWMU's located above and below the outfalls proposed for permit status. Also indicate on this map which outfalls receive storm water flow directly, or through collection systems (such as sumps) and at what volumes.

  The Laboratory did not include this information in the original NPDES Permit Re-Application, dated May 4, 1998, because it is not required by EPA. However, the Water Quality & Hydrology Group (ESH-18) is working with personnel from the Laboratory's Facilities for Information Management, Analysis, and Display Group (FIMAD) to develop an additional map for your review. The Laboratory will provide you with copy of the new map when it becomes available in approximately 30 days.

The Laboratory provided a listing of all active and deleted NPDES outfalls, and identified which outfalls receive storm water directly in the NPDES Permit Re-Application Form 2Cs and 2Ds and in Appendix C of the NPDES Permit Re-Application, dated May 4, 1998.

- Appendix T is a map that indicates all RCRA permitted sites. Please define which of these sites are currently classified as RCRA interim status sites? Also, indicate on this map any NPDES outfalls associated with these designated RCRA sites.

Per your request for additional information, we have enclosed a listing of RCRA permitted and interim status sites at the Laboratory, as of February 12, 1999 (Enclosure 4). RCRA interim status site delineation is not a requirement of the NPDES Permit Application process. Therefore, this information was not provided in the Laboratory's NPDES Permit Re-Application dated May 4, 1998.

NPDES outfalls that are directly or indirectly associated with interim or permitted RCRA facilities include the following:

(1) TA-16-387, 388, 399, 394, 401, 406 Open Burn; Outfall 05A055 (directly associated)
(2) TA-50-60A Treatment, Outfall 051 (directly associated)
(3) TA-3-29-9010, 9020, 9030 Storage, Outfall 03A021 (indirectly associated)

- The reapplication indicates some outfalls receive high amounts of flow (e.g., 001 and 051). High amounts of flow from outfalls may be causing erosion and/or impacting RCRA SWMUs located downstream. NMED-SWQB requests LANL address this issue by discussing with all facility managers utilizing outfalls, the importance of managing outfall flows through streamlining and/or modifying process management at the facility.

The impacts to surface water quality from Solid Waste Management Units (SWMUs) and Potential Release Sites (PRS) are being addressed under the Laboratory's NPDES Storm Water Multi-Sector General Permit No. NMR05A509. The Laboratory utilizes Administrative Procedure (AP) 4.5 to provide a systematic approach to identifying PRSs which have the potential to adversely impact surface water quality through surface water runoff, outfall discharges or other erosion processes. As part of the procedure, a Surface Water Site Assessment Team (SWAT) was established with representatives from the Laboratory's Environmental Restoration (ER) Project, Water Quality & Hydrology Group (ESH-18), DOE/Oversite Bureau, and LANL Facility Management. This effort has also been coordinated with representatives from the NMED-SWQB. The SWAT role is to provide recommendations from the AP 4.5 findings for the installation of Best Management Practices (BMPs) that may be needed to address erosion at PRSs. These recommendations are then provided to the ER Project and Facility Management for their evaluation. These findings may require that the Storm Water Pollution Prevention Plans be amended and corrective actions completed by Facility Management. Your concerns regarding high amounts of flow from certain outfalls will be forwarded to the SWAT for evaluation.

- DMR reports for NPDES outfall 051 indicates that problems may be occurring with the Total Toxic Organics (TTO) (e.g., results of 2 of 111 contributors to TTO were qualified as estimated under laboratory QA.QC methods). It is not clear as to what this means (e.g., which 2 of 111 contributors are involved). In addition, identify the laboratory used and explain what is meant by "estimated under laboratory QA/QC." NMED also asks that LANL begin reporting which constituents are elevated when TTO is qualified as estimated under laboratory QA/QC methods.

  Monitoring and testing for Total Toxic Organics (TTOs) is required by the Laboratory's NPDES Permit No. NM0028355 for Outfall 051, as defined by 40 CFR 433.11(e). The list of TTO's "organic constituents" are also located on Form 2C, Part C of the NPDES Permit Re-Application. Individual TTO values are not required to be submitted with the NPDES Permit Re-Application.

  NPDES compliance samples collected for TTO analysis at NPDES Outfall 051 are submitted to KEMRON Environmental Services, located in Marietta, Ohio, at a frequency of once per month. Samples collected for the NPDES Permit Re-Application were analyzed by Assaigai Analytical Laboratories, located in Albuquerque, New Mexico.

  Analytical laboratories used by the Laboratory are required to follow EPA approved analytical methods and protocols. Data is validated by the Laboratory's Analytical Chemistry Group (NMT-1). Group ESH-18 reports the TTO compliance data to EPA and NMED on the monthly Discharge Monitoring Reports (DMRs), as required by the NPDES Permit. The Laboratory is required to report only the summation of all the organic constituents in the TTO test on the Laboratory's DMR. Group ESH-18 uses the comment section of the DMR to report any "data qualifiers" noted during data validation. Per your request, the Laboratory will provide additional information on the data qualifiers on the DMRs.

- Barbara Hoditschek, on the tour of TA-50 conducted on October 29, 1998, was told that Investigative Derived Waste (IDW) was being received at TA-50. A notice of change of condition for outfall 051 reflects this change however, was not received or found in the reapplication. Please provide NMED-SWQB with a copy of this change of condition.

  The Laboratory submitted a Notice of Changed Condition to EPA and NMED-SWQB regarding the IDW wastes discharging to the TA-50 Radioactive Liquid Wastewater Treatment Facility (RLWTF) on July 3, 1997. This information was also included in the Appendix Q, Attachment 8 of the NPDES Permit Re-Application, dated May 4, 1998. This information was re-submitted to EPA and NMED on January 20, 1999 (LANL Memorandum ESH-DO:99-10).

3. 13S Outfall Issues

- During NMED's site visit with Scott Wilson of EPA, a liquid of unknown source and quantity was observed in the outfall 13S (a) sump. NMED had been informed during regular NPDES inspections that this outfall was not in use. It was obvious, however, from observation of the residual deposits above the drain line that the liquid in the sump had discharged through the sump drain and out the 13S (a) outfall. Please explain how future discharges will be prevented and/or eliminated. If 13S (a) is intended to be used, please submit a change to the reapplication.

The Laboratory is required to collect compliance samples at NPDES Outfall 13S, as documented on Page 15 of Part I of the NPDES Permit No. NM0028355. NPDES Outfall 13S is located at the parshall flume after the TA-46 SWSC Chlorine Contact Chamber (Latitude 35⁰ 51' 8", Longitude 106⁰ 16' 33"). Group ESH-18 submitted to EPA a NPDES Permit Re-Application Form 2C for NPDES Outfall 13S on May 4, 1998. NPDES Outfall 13S was also included in Appendix F of the Re-Application, which provided a topographical map, depicting outfalls located within the Laboratory's boundaries. The parshall flume (NPDES Outfall 13S) does not directly discharge to the environment but is diverted to other discharge locations cited in the NPDES Permit. NPDES Outfall 13S indirectly discharges to the environment at the following locations: (1) Below the TA-46 SWSC Plant into Canada del Buey (Latitude 35⁰ 51' 7", Longitude 106⁰ 16' 27"); (2) Old NPDES Outfall 01S (Latitude 35⁰ 52' 29", Longitude 106⁰ 18' 38"); and, (3) NPDES Outfall 001 and other Category 03A outfalls. On the map, Group ESH-18 labeled the discharges to the environment (Numbers 1 and 2) as 13S(b) and 13S(a), respectively. The 13S(a) and 13S(b) labels were used on the map as "location identifiers" only. The Laboratory does not intend to permit these discharges separately.

Treated effluent has never been released at the 13S(b) discharge point. The sump overflow pipe is plugged at the TA-46 SWSC Plant. A copy of the holding pond engineering design was provided to NMED-SWQB shortly after the October, 1998, EPA visit. A copy of the engineering drawing is included for your review (Enclosure 5). The liquid in question was storm water that had apparently seeped/infiltrated into the small, unsealed basin at 13S(b) discharge point. The residual deposits mentioned above were in fact small styrofoam pellets, apparently wind blown into the unsealed basin. The styrofoam pellets originated from insulation sheeting used in the remodel of one the buildings at the SWSC Plant. SWSC Plant operators collected fecal and nitrate samples from the unsealed basin. The fecal result was 8 cfu/100 ml, and the nitrate result was 1.7 mg/l. The presence of styrofoam, the low nitrate, and the presence of several fecal coliform bacteria, typical of dirty water, confirmed the assertion that the water is accumulated rainfall, rather than effluent.

- According to Mike Saladen, the 13S (b) outfall had been removed from the permit, but has not yet been plugged. Please indicate if and when it will be plugged. Also, please list any other NPDES outfalls that have been removed from the permit, but not plugged. Attach any schedule that may relate to this issue.

The 13S(a) discharge point which is the old 01S was eliminated on December 10, 1998. The Laboratory provided written notification to EPA and NMED-SWQB on January 20, 1999 (ESH-DO/99-10). A listing of other NPDES outfalls deleted from the NPDES Permit was provided as Appendix C of the NPDES Permit Re-Application. Many of these outfalls will not be plugged due to the continued discharge of storm water.

- The 13S outfall category is not clearly represented in the application. For example, a discrepancy exists regarding 13S, 13S (a), and 13S (b). Appendix F and Appendix C do not consistently reflect which outfalls exist. Also, the 13S (a) and 13S (b) outfalls are not listed as part of the application. Please modify and provide new information to the application which address these issues.

  The Laboratory is required to collect compliance samples at NPDES Outfall 13S, as documented on Page 15 of Part I of the NPDES Permit No. NM0028355. NPDES Outfall 13S is located at the parshall flume after the TA-46 SWSC Chlorine Contact Chamber (Latitude 35^0 51' 8", Longitude 106^0 16' 33"). Group ESH-18 submitted a NPDES Permit Re-Application Form 2C for NPDES Outfall 13S to EPA on May 4, 1998. NPDES Outfall 13S was included in Appendix F, which provided a topographical map, depicting outfalls located within the Laboratory's boundaries. The parshall flume (NPDES Outfall 13S) does not directly discharge to the environment but is diverted to other locations cited in the NPDES Permit. NPDES Outfall 13S is diverted to the environment at the following locations: (1) Below the TA-46 SWSC Plant into Canada del Buey (Latitude 35^0 51' 7", Longitude 106^0 16' 27"); (2) Old NPDES Outfall 01S (Latitude 35^0 52' 29", Longitude 106^0 18' 38"); and, (3) NPDES Outfall 001 and other Category 03A outfalls. On the map, Group ESH-18 labeled the discharges to the environment (Numbers 1 and 2) as 13S(b) and 13S(a), respectively. The 13S(a) and 13S(b) labels were used on the map as "location identifiers" only. The Laboratory does not intend to permit these discharges separately and a modification to the re-application does not appear to be necessary. Additionally, 13S(a) has been eliminated.

4. **Representative Sampling**

- Please clarify in the application, how sampling at outfalls 13S and 001 would be representative sampling.

- **Sample Collection-General:**

  Group ESH-18 followed the Form 2C Instructions, Item V. B. Sampling, which state in part: "*Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative of your normal operation, to the extent feasible, with all processes which contribute wastewater in normal operation, and with your treatment system operating with no system upsets. Samples should be collected from the center of the flow channel, where turbulence is at a maximum, at a site specified in your present permit, or at any site adequate for the collection of a representative sample.*" The definition of representative sample can be found on Page 3 of Part II, Section C. 2. of the Laboratory's NPDES Permit No. NM0028355.

  A Draft NPDES Permit Re-Application Project Implementation Plan (Implementation Plan), which included sampling protocol, was provided to NMED-SWQB and EPA for review and comment prior to the Laboratory submitting the NPDES Permit Re-Application. A detailed sampling plan was provided in Appendix

O of the Implementation Plan and as Appendix R in the re-application document. The final Implementation Plan was provided to EPA and NMED-SWQB on March 18, 1998 (Laboratory Memorandum ESH-18/WQ&H:98-0098).

Outfall 001: Page 2 of Part I of the Laboratory's current NPDES Permit states: "*Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Following the final treatment, prior to or at the point of discharge from outfall 001.*"

Samples collected in support of the NPDES Permit Re-Application for Outfall 001 were collected at the parshall flume located below the TA-3 Power Plant (Outfall 001). This is the same location that NPDES compliance samples are collected, as required by the current NPDES Permit. The Laboratory collected a 24-hour composite sample and analyzed for all constituents listed in the Form 2C Re-Application for Outfall 001.

Outfall 13S: Page 15 of Part I, of the Laboratory's current NPDES Permit states: "*Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Following the final treatment, prior to the point of discharge from the TA-46 SWSC Plant by gravity flow to Canada del Buey (Latitude 35° 51' 7" and Longitude 106° 16' 27"); and prior to the point of discharge from the TA-46 SWSC Plant into the effluent reuse line to Sandia Canyon (Latitude 35° 52' 29" and Longitude 106° 18' 38"); and to outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A (*6).*" Footnote (*6) states "*Treated effluent from the SWSC plant shall be controlled utilizing Best Management Practices in such a manner as to enhance and maintain wetland areas in Sandia Canyon and Canada del Buey, and to minimize movement off site.*"

Samples collected in support of the NPDES Permit Re-Application for Outfall 13S were collected at the parshall flume after the chlorine contact chamber prior to discharge into the reuse system (Outfall 13S). This is the same location that NPDES compliance samples are collected, as required by the NPDES Permit. The Laboratory collected a 24 hour composite sample and analyzed for all constituents listed in the Form 2C Re-Application for Outfall 13S.

Please note, sampling location language for Outfall 13S was drafted by EPA, in coordination with Laboratory and NMED-SWQB personnel. The August 1, 1994 NPDES Permit was certified by the NMED-SWQB. Additionally, the sampling location for NPDES Outfall 13S was required to be moved to the SWSC Plant as a result of the EPA Multi-Media Inspection conducted at the Laboratory in August 3-12, 1993.

5. **LANL Internal Outfall Issues**

- NMED-SWQB has seen several instances in the permit application which indicate potential internal outfalls may exist (e.g., effluent from TA-50, Room 60, is being blended into TA-50 effluent to be discharged to outfall 051). NMED considers internal outfalls as a source of potential future problems. Therefore, NMED-SWQB is requesting LANL evaluate all proposed outfalls and clearly identify which may fall under "internal outfalls" as characterized according to 40 CFR (h) (1 and 2).

All outfalls at the Los Alamos National Laboratory are properly permitted and monitored, as required by the NPDES Permit No. NM0028355. Additionally, the Laboratory's NPDES Permit Re-Application and results of the Laboratory's Waste Stream Characterization Project does not document that any waste stream located from TA-50, Room 60 which is being blended to discharge at Outfall 051. Radioactive and industrial waste streams from the TA-55 Plutonium Facility are discharged into Room 60, at the TA-50 Radioactive Liquid Wastewater Treatment Facility (TA-50 RLWTF). The influent from TA-55 is sampled and is directed to the headworks of the TA-50 RLWTF. All effluent is treated through the wastewater treatment plant, re-sampled, and discharged to Outfall 051 when it meets NPDES Permit limits.

Please note that internal outfalls are defined by 40 CFR Part 122.45 (h) (1) and (2).

6. HE Plant

- Please provide NMED with a list and/or characterization of the HE/organic pollutants being introduced into the TA-16 Plant. NMED-SWQB also would like to have a copy of the WAC for this facility.

  A list of potential pollutants of concern, and analytical data for the TA-16 High Explosives Wastewater Treatment Facility (TA-16 HEWTF) was submitted on the Form 2C, Table 2C3 and Table 2C4 of the NPDES Permit Re-Application. The Waste Acceptance Criteria (WAC) for the TA-16 HEWTF is included as Enclosure 6.

- During a site visit of LANL with Scott Wilson of EPA, Barbara Hoditschek was told that the old TA-16 plant was to remain in service as a "standby plant". NMED-SWQB requests information describing what factors would trigger the use of the old TA-16 plant as a "standby" plant. Will the effluent from the old plant be comparable in quality to that of the new plant? How and when will the effluent be tested when the old plant is used?

  Factors which would trigger the use of the "old" TA-16 HEWTF as a back-up plant include, hydraulic overload, equipment failure or other such off normal conditions at the "new" TA-16 HEWTF. The two treatment plant processes are comparable except for the amount of effluent that can be treated at each facility. Increased filtration is available at the new TA-16 HEWTF. The effluent quality from each facility is comparable. All compliance samples for both facilities can be collected at NPDES Outfall 05A055, as required by the Laboratory's current NPDES Permit.

- In the application, Appendix V, page 2, 2nd paragraph, the following is stated, "The EA compares the impacts of the proposed action with those of continuing to operate the existing temporary wastewater treatment facility without making any modifications to HE operations or reducing HE wastewater discharges (the "no action" alternative). Under this alternative, it is anticipated that HE wastewater discharges would periodically violate existing and future EPA discharge standards. Explain how LANL proposes to correct this situation at the old plant?

The Environmental Assessment was a driving force behind the construction of the "new" TA-16 HEWTF and the need to meet existing and future potential discharge standards. As stated in number 6 above, the "old" TA-16 HEWTF will be used only as a backup in emergency situations under reduced HE discharge conditions.

7. **Outfalls not in use**

- It was noted during a DMR review, that some outfalls have not been sampled for several years (e.g., 05A097, 03A-040, 03A-024, 03A-160, 04A-118 etc.). This seems to indicate they are also not being used. Please explain why no samples were taken, and why these outfalls should remain on the permit? Also identify any other outfalls which are not being used, but still remain on the application.

Following is a brief summary of the Laboratory's NPDES Outfall Reduction Program:

The Laboratory's 1990 Permit Re-Application contained information on 117 outfalls. By 1993, the Laboratory added 24 new outfalls for a total of 141. Since 1993, through several efforts including the Waste Stream Characterization Program and Corrections Project, construction of two new wastewater treatment facilities at TA-46 and TA-16, and most recently the NPDES Outfall Reduction Program, the Laboratory has deleted 107 outfalls from the existing NPDES Permit. These deleted outfalls are noted in Appendix C of the re-application document.

Under the NPDES Outfall Reduction Program, un-utilized, underutilized, and unnecessary outfalls are identified and targeted for elimination. The "target" outfalls cover all types of wastewater systems including, sanitary (Category S), radioactive (Category 051), and industrial. Industrial effluents include waste stream categories: 001 Power Plant; 02A Steam Plant; 03A Treated Cooling; 04A Once-through Cooling and Water Production Well Facilities; 05A High Explosives; 06A Photo Rinse Water; 07A Asphalt Plant; and, 128 Printed Circuit Board.

NPDES regulations and the Laboratory's current NPDES Permit required all "target" outfalls to be monitored and identified in the Discharge Monitoring Reports (DMRs) as long as the "target" outfalls are included under the current permit. In many cases, no effluent was discharged from these "target" outfalls during the established monitoring period due to no operational activity and, therefore, no samples could be collected. *"No Discharge Verification Forms"* were signed for these no-sample events by both the outfall contact and the person performing the compliance monitoring. These no-discharge forms are maintained at the Laboratory as part of the NPDES Permit compliance records.

As of January 11, 1999, 107 of the 121 targeted outfalls, have been eliminated from the NPDES Permit. The elimination of the remaining 14 outfalls by October, 1999, is

pending completion of physical construction and/or approval from EPA, and the concurrence of NMED. These 14 outfalls include: NPDES Outfall 03A045 located at TA-48-1, and 13 non-contact cooling water (Category 04A) outfalls associated with the Los Alamos Water Supply System.

Following completion of all scheduled outfall reduction activities, the Laboratory is expected to have 20 remaining outfalls in the NPDES Permit No. NM0028355. These 20 NPDES outfalls are currently permitted by EPA and will remain on the Laboratory's NPDES Permit as long as they are required.

The Laboratory has future plans to further reduce the number of permitted outfalls. Additional elimination of outfalls will be accomplished as a result of the long-term NPDES Outfall Reduction Program objectives which requires evaluation for continued outfall operation by the Laboratory Division Directors, Facility Managers, and/or outfall owners. Outfall owners will also be required to develop designs and plant modifications which provide for "reduced" or "zero discharge" of wastewater effluent.

8. Old permit issues included in this reapplication

- In the reapplication, (Volume 1, page 1, paragraph 5), LANL indicates that the previous applications and other documents will be used as supporting documents. NMED requests that LANL provide citations and a copy of all documents that will be used as part of this application.

  In December 1998, Barbara Hoditscheck, NMED-SWQB, and Steven Rae, Group ESH-18 discussed this matter and agreed to include information from the issuance of the Laboratory's NPDES Permit No. NM0028355, dated August 1, 1994, to the present. The Laboratory provided this information to NMED-SWQB on January 20, 1999 (LANL Memorandum ESH-DO:99-10) under Supplement 2 of the NPDES Permit Re-Application.

- Volume I, page 5, 2nd paragraph of the reapplication states, "Currently, designated State Water Quality Standards do not exist for the intermittent drainage's located with in the laboratory boundaries, only for the Rio Grande itself". NMED-SWQB disagrees with this statement. While there are no designated uses specified in subpart II of the current New Mexico Standards for Interstate and Intrastate Streams (20 NMAC 6.1), designated uses are specified in § 1105.A of the standards. Further, existing and attainable use will need to be considered in review of this permit application.

  No information or response requested by NMED-SWQB.

9. Transfer of wells to Los Alamos County

- According to Scott Wilson (EPA), the transferred wells indicated in the lease, and proposed for removal from LANL's permit, will be removed by EPA when they receive an application from Los Alamos County. Describe how DOE/LANL will assure that the county submits this application since the lease agreement itself does not set a timeline for submittal.

Since September 1998, the Laboratory has been engaged in several oral and written communications with the EPA, DOE, NMED-SWQB, and the Los Alamos County regarding: the DOE's lease agreement for transfer of the Los Alamos Water Production System to Los Alamos County; the deletion of associated NPDES outfalls from the Laboratory's NPDES Permit No. NM0028355; and, the submittal of an NPDES application to EPA by Los Alamos County for these outfalls. Following is a chronology of written documentation on-file:

(1) September 14, 1998, letter (ESH-DO:98-268) from Dennis J. Erickson, ESH-DD, LANL, to William B. Hathaway, Director, EPA Region 6. The Laboratory notifies EPA of DOE's lease agreement with Los Alamos County to assume operational responsibility for the Los Alamos Water Production System, and requests that the thirteen (13) NPDES Outfalls associated with the drinking water system be deleted from the Laboratory's NPDES Permit No. NM0028355. NMED-SWQB was provided with a copy of this letter.

(2) December 22, 1998 letter from Chris Ortega, Utility Manager, Los Alamos County, to William B. Hathaway, Director, EPA Region 6 (Enclosure 7). In the letter, the Los Alamos County: notifies EPA of the DOE's lease agreement to transfer responsibility of the Los Alamos water production system to the Incorporated County of Los Alamos; requests an evaluation by EPA for the need to permit the subject drinking water supply wells under NPDES; and, requests that the Los Alamos Water Supply System portions of the NPDES permit renewal request submitted May 4, 1998, by the DOE and LANL be considered as the application by Los Alamos County for permitting the facilities.

(3) January 7, 1999, letter (ESH-DO:003) from Dennis J. Erickson, ESH-DD, LANL, to William B. Hathaway, Director, EPA Region 6. The Laboratory clarifies a conversation between Wilma Turner of EPA Region 6, and Mike Saladen, ESH-18, LANL, wherein Ms. Turner indicates to Mike Saladen, that the EPA would not delete the 13 NPDES outfalls associated with the Los Alamos Water Supply System from the Laboratory's NPDES Permit No. NM0028355 until the Los Alamos County submitted NPDES applications for the outfalls to EPA. The letter also clarifies the Laboratory's understanding that Scott Wilson, Permit Writer, EPA Region 6, advised Tim Glasco, Deputy Utility Manager, County of Los Alamos, to submit an application to EPA for permitting the water supply system facilities. A copy of this letter was previously provided to NMED-SWQB.

(4) January 11, 1999, letter from Jack V. Ferguson, P.E., Chief, NPDES Permits Branch, EPA Region 6 to David Gurule, Area Manager, DOE Los Alamos (Enclosure 8). EPA indicates to DOE that until the leasee (Los Alamos County) has submitted an NPDES Permit Application for the thirteen (13) NPDES Outfalls associated with the Los Alamos Water Supply System, the

EPA recommends that the 13 outfalls not be deleted from the Laboratory's NPDES Permit No. NM0028355. A copy of this letter was provided to NMED-SWQB.

(5) February 22, 1999, letter (LAAME:3JV-017) from Joseph C. Vozella, Assistant Area Manager, Office of Environment, DOE Los Alamos, to Joseph C. King, County Administrator, Incorporated County of Los Alamos. Mr. Vozella clarifies his understanding that the EPA Region 6 has determined that the County of Los Alamos must submit its own application for the 13 NPDES outfalls associated with the Los Alamos Water Supply System. He states further, that he encourages the County to take action to submit an application as soon as possible so that the 13 outfalls could be deleted from the Laboratory's NPDES Permit No. NM0028355, and that LANL will continue to file Discharge Monitoring Reports for these discharges until EPA accepts the County's permit application. A copy of the letter is provided as Enclosure 9.

(6) March 2, 1999, letter (ESH-18/WQ&H:99-0065) from Steven Rae, Group Leader, Group ESH-18, to Chris Ortega, Utility Manager, Los Alamos County. In the letter, the Laboratory transmits to the Los Alamos County copies of the following documents for their use in submitting an application to EPA: NPDES Permit application instructions; an original *Form 1 General* to be completed by Los Alamos Country, completed original *Form 2C* applications for the 13 existing NPDES outfalls, completed original *Form 2D* applications for 12 new sources or discharges, and, other miscellaneous application support documentation and information associated with these discharges. A copy of this documentation was transmitted to NMED-SWQB.

The cover-letter to Los Alamos County indicates that the application forms were completed with all outfall discharge-related information required by the NPDES application instructions except for specific applicant data which is required to be filled out by the Los Alamos County on *Form 1 General*, original signatures, and dates the forms are signed. In the letter, the Laboratory also offers to meet with Los Alamos County staff to respond to questions and further assist them in completing this effort, and requested that copies of all information submitted to the EPA be provided to Group ESH-18 so that the Laboratory can maintain a complete file on these NPDES outfalls. A copy of this cover-letter was transmitted to NMED-SWQB.

- Appendix C needs to be revised as per the letter of September 4, 1998, which reflects the water system transfer. Outfalls, 03A-040, 03A-045, and 06A-106 are pending outfalls that were not covered in volume 1 of the reapplication. Please provide the necessary information. Also provide the following exhibits indicated as part of the lease, but which were provided in the reapplication: A, B, and D through H. In addition, please identify SWMUs found above and below all wells and indicate these on the system map (exhibit C of the lease).

NPDES Outfalls 03A040, 03A045, and 06A106 were not included in the reapplication because the discharges to these outfalls were in the process of being eliminated. In a

letter dated November 25, 1998, (LAAME:6BK-015), from David A. Gurule, Area Manager, DOE Los Alamos, to William Hathaway, Director, EPA Region 6, the Laboratory requested deletion of NPDES Outfalls 03A040 and 06A106. In a responding letter dated January 11, 1999, from Jack V. Ferguson, P.E., Chief, NPDES Permits Branch, to David A. Gurule, Area Manager, DOE Los Alamos Area Office, the EPA notified the Laboratory of the deletion of the two NPDES outfalls 03A040 and 06A106 from the Laboratory's NPDES Permit No. NM0028355. A copy of this letter was provided to NMED-SWQB.

No effluent is currently discharging to NPDES Outfall 03A045 located at TA-48-1. Construction to modify the outfall piping is scheduled to be completed within 60 days. The Laboratory will then submit a request to EPA for the elimination of this outfall from the Laboratory's NPDES Permit.

The Laboratory is a not party to the Lease Agreement and is not authorized to release the exhibits which you have requested. Please contact the DOE Los Alamos Area Office or the Los Alamos County Attorney's Office for this information.

10. NOI Potable Water Issues

- The potable water Notice of Intent (NOI) in the application should be addressed as a state WQCC issue and not a federal NPDES issue. It is suggested that it be removed from the reapplication.

The Notices of Intent to Discharge (NOIs) were submitted as part of the application for informational purposes only.

11. NEPA

- The reapplication states that NEPA documents were written for outfalls which were removed from the NPDES application. Does DOE plan to submit a NEPA for the remaining outfalls? If not, please explain.

DOE's National Environmental Policy Act (NEPA) Regulations require that an Environmental Assessment be performed to determine impacts to the environment from the reduction of effluent and elimination of outfalls. The Laboratory will prepare an Environmental Assessment as necessary for any future NPDES permitted outfalls targeted for reduction of effluent not covered by previous assessments.

12. Outfalls

- NMED-SWQB requests LANL provide a schedule for any proposed "future" outfall elimination.

Currently, fourteen (14) NPDES Outfalls are pending elimination from the Laboratory's NPDES Permit. These outfalls include: 03A045 and thirteen (13) non-contact cooling water outfalls (Category 04A) associated with the Los Alamos Water Supply System.

No proposed or final schedule is available for the elimination of these NPDES permitted outfalls. Once a schedule is developed, it will be transmitted to the NMED-SWQB under separate cover.

- Has LANL addressed all outfalls associated with arsenic problems? (e.g., all 03A outfalls proposed in the application)? Please provide information clarifying this issue. Identify an outfalls that still have arsenic problems, and indicate when the problem will be resolved.

All cooling tower outfalls (NPDES Category 03A) which have had arsenic problems have been addressed. Corrective actions taken to address the arsenic problems include: removal of arsenic treated wood from the cooling towers structure and replacement with non-arsenic containing materials; cooling towers taken off-line; operational sampling; and, controlling the blow-down cycles of concentration or treatment through ion exchange systems. The long-term corrective actions for the TA-53 cooling towers (NPDES Outfalls 03A048 and 03A049) is to replace the two wooden cooling towers with new unit(s) constructed of other materials. This information has been provided in Appendix Q of the NPDES Permit Re-Application and Attachment 7 of Supplement 2.

- NMED-SWQB requests that outfalls associated with cooling towers be monitored for chromium 6 (cr6). Data from samples collected from Sandia wetlands have found to contain high levels of Chromium (4,000 ppm). This may imply that the high volume of cooling tower water being discharged from outfall 001 may have contained Cr6.

Chromium 6 is not a specified monitoring parameter under the Laboratory's current NPDES Permit or in the Form 2C of the NPDES Application. Chromium 6 has not been used in water treatment chemicals for many years, therefore is not expected to be in the Laboratory's cooling tower effluent. Group ESH-18 can assist in coordinating an effluent screening effort for Chromium 6 with the NMED-DOE Oversite Bureau, if such is desired. A formal follow-up sampling to support the Laboratory's NPDES Permit Re-Application can then be conducted if screening results indicate a presence of Chromium 6.

- Identify all outfalls (permitted and closed) which were associated with the 10 old wastewater treatment plants. What volumes of storm water have/do they receive?

All outfalls (permitted and closed) associated with the 10 old wastewater treatment plants are noted in Appendix C of the Laboratory's NPDES Permit Re-Application. There are no discharges from the old wastewater treatment plants. NPDES Outfall 13S is the only NPDES outfall permitted in the sanitary outfall category. The Laboratory's re-application document provides information on storm water discharges to the TA-46 SWSC Plant.

13. WAC

- How will LANL ensure that the WAC is properly implemented? Describe the procedure/process used to assure compliance with the WAC. When will EPA or NMED-SWQB be notified if the WAC is violated?

- NMED has received some, but not all, WACs and the Waste Management Policy. Comments are not included in this letter, but will addressed under separate cover.

- NMED would appreciate further information regarding the composition of the SWSC task force (e.g., what groups are represented). We believe inclusion of this information would be beneficial.

The Laboratory has developed Waste Acceptance Criteria (WAC) for the TA-50 RLWTF, TA-46 SWSC Plant, and the TA-16 HEWTF. Any Laboratory facility planning a new discharge into one of the aforementioned treatment facilities must provide a Waste Profile Form (WPF) for approval prior to disposal into the collection system. Waste streams on the WPF are characterized by both knowledge of process, analytical data, and must meet NPDES Permit requirements. All waste streams that do not meet the site-specific WAC criteria cannot discharge into the system. A facility wishing to discharge may apply for a variance to the policy. The variance must be approved by the Facility Management that owns the wastewater treatment process, the wastewater treatment plant operator and ESH-18 Group representative. A Notice of Changed Condition may be required to be submitted to EPA and NMED to meet NPDES Permit requirements. Examples of such notifications were previously provided to NMED-SWQB on January 20, 1999, under Supplement 2 of the Laboratory's NPDES Permit Re-Application, and in the original NPDES Permit Re-Application dated May 4, 1998. All existing waste streams are being reviewed for compliance with the WACs.

A description of the Waste Acceptance, Characterization, and Certification Program was submitted to NMED-SWQB on January 20, 1999, under Supplement 2 of the Laboratory's NPDES Permit Re-Application. Additionally, a copy of the Waste Profile Form (WFP) was provided to EPA and NMED in the original Re-Application and again on January 20, 1999. The WPF contains the WAC for the TA-50 RLWTF and TA-46 SWSC Plant. A copy of the TA-16 HEWTF's WAC is enclosed (Enclosure 6).

The TA-46 SWSC Task Force includes representatives from Johnson Controls Northern New Mexico (JCNNM) Wastewater Treatment Supervisor, Facilities Division, Utilities and Infrastructure Group (F-4), JCNNM Environmental Laboratory (JCNNM-TENV), Department of Energy, Los Alamos Area Office (DOE-LAAO), Hazardous Waste Group (ESH-19) and Group ESH-18.

14. Miscellaneous

- No form 2C was included in the reapplication as indicated per Volume 1 page 12 of the reapplication.

The Laboratory's NPDES Permit Re-Application, Volumes I and II, contain completed Form 2Cs for 34 NPDES permitted outfalls and Form 2Ds for 13 new source discharges, plus other relevant information including process flow diagrams, data summaries, location maps, etc. A listing of the 34 permitted outfalls and 13 new source discharges is provided as Appendix C in the Laboratory NPDES Permit Re-Application document. The third binder noted as "Appendices" also contains miscellaneous support documentation. Please advise if you have any missing Form 2Cs in your re-application document.

- Please provide a copy or explanation of the NPDES sampling protocol.

An explanation of the NPDES Permit Re-Application Sampling Plan was provided in Section 5.2.4 of the *Laboratory's NPDES Permit Re-Application Project Implementation Plan.* Also provided as Appendix O of the *Laboratory's NPDES Permit Re-Application Implementation Plan* was a completed copy of the "Sampling Plan for Los Alamos National Laboratory's NPDES Permit re-application," dated October, 1997. A "Draft" copy of this Implementation Plan was hand-carried by Mike Saladen and Tina Marie Sandoval, of ESH-18, to a January 30, 1998, meeting with Scott Wilson of EPA Region 6 in Dallas Texas. Permit Re-application sampling issues were discussed with EPA in detail. A copy of the meeting minutes from the EPA meeting noting conversations with EPA and clarification of issues were transmitted to NMED-SWQB, on March 13, 1998. In addition, a final copy of the Implementation Plan including the Laboratory's NPDES sampling protocol again noting all conversations and agreements with EPA including the issues discussed at the January 30, 1998 meeting, was hand-delivered to NMED-SWQB on March 13, 1998. A final copy of the Implementation Plan was also transmitted via U.S. mail to EPA , Steve Yanicak, NMED DOE/OB, and others on March 18, 1998.

A detailed explanation of the NPDES sampling protocol was included on page 19, Section 7.2 of the *Laboratory's NPDES Permit Re-Application.* A complete copy of the "revised April 1998" sampling plan was provided in the reapplication as Appendix R. A copy of the reapplication was hand-delivered to the NMED-SWQB, on May 4, 1998.

- Appendix M (Sludge Handling Procedure) does not address current sludge disposal practices (e.g., language in the application states that LANL will dispose of sludge pursuant to TOSCA regulations). NMED also requests the following information regarding this disposal be provided during the life of the permit: volumes disposed, PCB analysis associated with those volumes, and location of disposal site.

The sludge handling procedures were identified in the "Notification of Planned Change In Sewage Disposal Practice at Los Alamos National Laboratory, NPDES Permit No. NM0028355" submitted to EPA and NMED on July 31, 1997. Due to the routine presence of low-level PCBs in the TA-46 SWSC Plant, sanitary treatment solids (sludge and grit/screenings), the Laboratory made a formal change in sludge management practice. Land application of the sludge was suspended for an indefinite period of time in May, 1996. All sanitary treatment solids generated at the TA-46

SWSC Plant have been handled, stored, sampled, and disposed of as a PCB contaminated waste. EPA approved the sludge disposal practice change in a letter dated November 13, 1997 from Nelson Smith, EPA, to Steven Rae, ESH-18. All sludge is characterized and documented on a Waste Profile Form according to LIR404-00-1.2, Waste Acceptance, Characterization, and Certification Program, and LIG404-00-03.0, Waste Profile Form Guidance. This information was previously provided to NMED-SWQB in Appendix M of the original NPDES Permit Re-Application and in Supplement 2.

Information regarding sludge disposal, sludge volumes, PCB levels associated with the sludge volumes and disposal location is included in the Laboratory's annual report required by the Laboratory's Ground Water Discharge Plan. Copies of the 1996, 1997 and 1998 annual report have previously been transmitted to the NMED-SWQB. Copies of the annual reports are included as Enclosures 10, 11, and 12.

The Laboratory will continue to evaluate the long-term waste issues and options regarding the management of the Laboratory's sludge. Appendix M, the *"Laboratory's Sludge Handling Procedures"* will be modified accordingly to include changes in disposal practices. A copy of the modified sludge handling procedures will be transmitted to EPA and NMED-SWQB under separate cover. The Laboratory will provide written notification to EPA and NMED and request authorization under the NPDES Permit, prior to change in disposal practices.

- Please provide information concerning testing results and disposal volumes of grit and screenings. Also, provide language in the reapplication indicating LANL's commitment to provide this information in the future.

Information regarding sampling, testing, and reporting of sludge has previously been provided to NMED-SWQB, in a Notice of Changed Condition, ESH-18/WQ&H:97-0216, dated July 31, 1997. The information requested is also documented in Appendix M of the Laboratory's NPDES Permit Re-Application document. Please refer to the above documents for details. Information concerning testing results of sludge, grit and screenings for 1997 and 1998 is included in Enclosure 13 and will be provided to EPA and NMED-SWQB in the future.

- As indicated on pages 5-7 of the reapplication, "The regional aquifer of the Los Alamos area occurs at the depth of 1200 ft along the western edge of the plateau, and 600 ft along the eastern edge". Please provide information clarifying if the distance provided to the regional aquifer is measured from a mesa top or canyon bottom. Also, since LANL has defined the depth of the regional aquifer it would be appropriate to address the depth to all alluvial, intermediate perched or regional ground water occurrences and this related to NPDES outfall discharges.

The depth of 1200 ft along the western edge of the plateau to the regional aquifer was measured from the mesa top whereas the depth of 600 ft along the eastern edge to the regional aquifer was measured from the canyon bottom. This information is discussed in more detail on page 2-21 of the Laboratory's *Hydrogeologic Workplan*, dated May 22, 1998.

The Laboratory's *Hydrogeologic Workplan* describes activites proposed to be performed by the Laboratory to characterize the hydrogeologic setting beneath the Laboratory, and to enhance the Laboratory's groundwater monitoring program.

The centerpiece of the Workplan is the installation of additional wells that will provide for a better understanding of the hydrogeologic framework at the Laboratory, including recharge areas, hydraulic interconnections, flow paths, and flow rates, synthesized by modeling simulations. A copy of the Laboratory's Hydrogeologic Workplan has been provided to the NMED-SWQB on May 22, 1998 (Enclosure 14). The depths to all alluvial, intermediate perched, and regional ground water occurrences as related to NPDES outfall discharges are not fully known. Such an understanding of the subsurface hydrogeology is the subject of the Hydrolgeologic Workplan and new Monitoring Well Project.

- Please describe the QA/QC protocols that LANL uses at it's internal laboratory (the lab which provides the information for the Environmental Surveillance Report). Also, provide information that all other laboratories that are/were used employ adequate QA/QC procedures.

Analytical laboratories used by the Laboratory during the Laboratory's NPDES Permit Re-Application Project were required to follow EPA approved analytical methods and protocols. The QA/QC program required the analysis of a minimum of 10% duplicates, spikes and blanks during the analyses. Additionally, blind spike samples were submitted to the analytical laboratory by Group ESH-18. Data was validated by the Laboratory's Analytical Chemistry Group (NMT-1). A summary of the NPDES Permit Re-Application's Quality Assurance Program is documented in the Laboratory's NPDES Permit Re-Application Project Implementation Plan.

Specific QA/QC protocols used by the Laboratory's internal analytical testing laboratory in reporting data for the Laboratory's Annual Environmental Surveillance Report may be inspected by the NMED-SWQB at TA-59, Building 96. We will provide a special session for the NMED-SWQB on the QA/QC protocols completed under the Laboratory's Environmental Surveillance Program if such would be helpful. NMED can then determine the specific information which is desired.

EXHIBIT

Z

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: March 18, 1999
In Reply Refer To: ESH-18/WQ&H:99-0093
Mail Stop: K497
Telephone: (505) 665-1859

Mr. William Hathaway, Director
Water Quality Protection Division (6WQ)
U. S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NPDES PERMIT NO. NM0028355, SUPPLEMENTAL INFORMATION FOR NPDES PERMIT RE-APPLICATION BASED UPON RECENT WASTE STREAM SURVEY

Dear Mr. Hathaway:

On May 4, 1998, the U. S. Department of Energy, Los Alamos Area Office (DOE-LAAO) and the University of California (UC) submitted an application for renewal of the National Pollutant Discharge Elimination System (NPDES) Permit for the Los Alamos National Laboratory (Laboratory). The Laboratory's NPDES Permit Re-Application was provided in accordance with the requirements of 40 CFR 122.21 and NPDES Permit No. NM0028355. The Laboratory's NPDES Permit Re-Application provided specific information regarding the Technical Area 50 Radioactive Liquid Wastewater Treatment Facility (TA-50 RLWTF).

The TA-50 RLWTF treats industrial and radioactive waste received from facilities throughout the Laboratory. The treated effluent is discharged into Mortandad Canyon through NPDES Outfall 051. During 1998, a working group was established to evaluate alternatives to attain zero discharge of treated wastewater from the TA-50 RLWTF to Mortandad Canyon. In support of the Zero Discharge Project, the Laboratory's Water Quality and Hydrology Group (ESH-18) and Environmental Management Division, Radioactive Liquid Waste Group (EM-RLW), sponsored a series of radioactive liquid waste minimization surveys of Laboratory facilities. Benchmark Environmental Corporation (Benchmark) conducted surveys to identify generators and discharges of tritium and accelerator-produced isotopes into the TA-50 RLWTF. Based on the surveys, Benchmark prepared the "*Radioactive Liquid Waste Minimization Survey Report For Tritium and Accelerator-Produced Isotopes*", dated February 4, 1999 (copy enclosed). The report identifies a list of potential discharges of tritium and accelerator-produced isotopes to the TA-50 RLWTF. Please note that these accelerator-produced isotopes are present in small amounts in the influent to TA-50 RLWTF. These isotopes originate primarily from medical tracer and environmental monitoring research activities at the Laboratory. The Laboratory is providing this supplemental information because it was not included in the Laboratory's NPDES Permit Re-Application, dated May 4, 1998.

ESH-18, Benchmark and EM-RLW personnel will continue working with operating groups to investigate pollution prevention and waste minimization opportunities to meet the zero discharge goal. Potential opportunities include segregation and collection of radioactive waste streams, and treatment and storage at alternative disposal sites.

Please contact me at (505) 665-1859 or Mike Saladen at (505) 665-6085 if you have any questions or need additional information.

Sincerely,

Lisa Marie Sandoval

for Steven Rae
Group Leader
Water Quality and Hydrology Group

SR/MS/mm

Enclosures: a/s

Cy: E. Spencer, EPA, Region 6, Dallas, Texas, w/enc.
S. Wilson, EPA, Region 6, Dallas, Texas, w/enc.
P. Bustamante, NMED/GWQB, Santa Fe, New Mexico, w/enc.
B. Hoditschek, NMED/SWQB, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/LAAO, w/enc., MS A316
J. Plum, DOE/LAAO, w/o enc., MS A316
T. Gunderson, DLDOPS, w/o enc., MS A100
T. Baca, EM-DO, w/o enc., MS J591
S. Hanson, EM-RLW, w/o enc., MS E518
P. Worland, EM-RLW, w/o enc., MS E518
D. Woitte, LC-GEN, w/o enc., MS A187
D. Erickson, ESH-DO, w/o enc., MS K491
M. Saladen, ESH-18, w/enc., MS K497
T. Sandoval, ESH-18, w/enc., MS K497
H. Decker, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
N. Williams, ESH-18, w/o enc., MS K497
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

RADIOACTIVE LIQUID WASTE WASTE MINIMIZATION SURVEY REPORT FOR TRITIUM AND ACCELERATOR-PRODUCED ISOTOPES

REVISION 0

February 4, 1999

Project No. 5061.17.0001

Prepared by:

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Prepared for:

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ACRONYMS AND ABBREVIATIONS

AEA	Atomic Energy Act (42 U.S.C. 2011, et seq.)
CAA	Clean Air Act
CWA	Clean Water Act (33 U.S.C. 1251, et seq.)
DCG	Derived Concentration Guide
DOE	U.S. Department of Energy
EM-RLW	Environmental Management Division, Radioactive Liquid Waste Group
EPA	U.S. Environmental Protection Agency
ESH-17	Environmental Safety and Health Division, Air Quality Group
ESH-18	Environmental Safety and Health Division, Water Quality and Hydrology Group
ESH-19	Environmental Safety and Health Division, Hazardous and Solid Waste Group
FMU	Facility Management Unit
IDB	*Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation Influent Design Basis* (LANL 1995b)
LANL	Los Alamos National Laboratory
LANL WAC	*LANL Waste Acceptance Criteria* (LANL 1998e)
LANSCE	Los Alamos Neutron Science Center
NMED	New Mexico Environment Department
NMAC	*New Mexico Administrative Code*
NMSA	*New Mexico Statutes Annotated*
NMWQCC	New Mexico Water Quality Control Commission
NPDES	National Pollutant Discharge Elimination System
P2/WMin	pollution prevention and waste minimization
PET	positron emission tomography
RAM	radioactive material (or radionuclide)
RCRA	Resource Conservation and Recovery Act
RLWCS	Radioactive Liquid Waste Collection System
RLWTF	Radioactive Liquid Waste Treatment Facility
TA	technical area
TSDF	treatment, storage, and disposal facility
TSFF	Tritium Science Fabrication Facility
TSTA	Tritium Systems Test Assembly
UMS	unmonitored point source
Usage Survey	*1997 Radioactive Materials Usage Survey for Point Sources* (LANL 1998a)
Zero Discharge Report	*Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility* (LANL 1998c)

RADIOACTIVE LIQUID WASTE WASTE MINIMIZATION SURVEY REPORT FOR TRITIUM AND ACCELERATOR-PRODUCED ISOTOPES

1.0 INTRODUCTION

The Radioactive Liquid Waste Treatment Facility (RLWTF) located at Technical Area (TA)-50, Building 1 treats industrial and radioactive liquid waste received from Los Alamos National Laboratory (LANL) TAs. The treated effluent is discharged to Mortandad Canyon. The Clean Water Act (33 U.S.C. 1251, et seq.) (CWA) established the National Pollutant Discharge Elimination System (NPDES), which requires permitting point-source effluent discharges to the nation's waters. The RLWTF effluent is regulated by NPDES permit number NM0028355, outfall number 051, which establishes specific chemical, physical, radiological, and biological criteria that an effluent must meet before it is discharged. The University of California and U.S. Department of Energy (DOE) are co-permittees of this permit, which is administered by U.S. Environmental Protection Agency (EPA) Region 6 and certified by the New Mexico Environment Department (NMED) Surface Water Quality Bureau.

The CWA regulates the discharge of radioactive materials not covered by the Atomic Energy Act (42 U.S.C. 2011 et seq.) (AEA), including radium and accelerator-produced isotopes under 40 *Code of Federal Regulations*, Part 122.2. Man-made sources of tritium may be reactor- or accelerator-produced. The list of other accelerator-produced isotopes depends on the type of accelerator and target material used. The AEA regulates source, special nuclear, and by-product materials.

The New Mexico "Water Quality Act" (*New Mexico Statutes Annotated* [NMSA] 1978) establishes the New Mexico Water Quality Control Commission (NMWQCC) as the state's water pollution control agency. The NMWQCC regulates liquid discharges to both surface waters and discharges onto or below the ground surface in the state under the, "New Mexico Water Quality Control Commission Regulations" (20 *New Mexico Administrative Code* [NMAC] 6.2). "Water Quality Standards for Interstate and Intrastate Streams in New Mexico" (20 NMAC 6.1) establishes specific surface water standards. The NMWQCC has delegated authority for water pollution control to the NMED. Specific numerical and narrative surface water standards are developed by NMED and approved by EPA. Effluent limits that apply to the RLWTF NPDES permit are established in the permit by EPA and certified by NMED.

Concentrations of radionuclides in surface water samples may be compared to 20 NMAC 6.1 surface water standards, the "New Mexico Radiation Protection Regulations" (20 NMAC 3.1), and DOE Derived Concentration Guides (DCGs) established in DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. The 20 NMAC 6.1 surface water standard for accelerator-produced tritium is 20,000 pCi/L. The 20 NMAC 3.1 radiation protection levels are generally two orders of magnitude greater than the DOE DCGs for public dose.

The DOE has requested that LANL voluntarily reduce its discharge of a number of radionuclides, including tritium and accelerator-produced isotopes. As stated in, *Environmental Surveillance at Los Alamos National Laboratory during 1997* (LANL 1998d), the RLWTF effluent included tritium, sodium-22, strontium-89, strontium-90, cesium-137, uranium-234, uranium-235, plutonium-238, plutonium-239, plutonium-240, and americium-241 during 1997.

DOE and LANL have determined that all tritium in the RLWTF effluent is reactor-produced for LANL programs with weapons missions. The *DMR Outfall Data Summary, August 1, 1994 to December 31, 1997* (LANL 1998b) reported a high concentration of 147,059 pCi/L for reactor-produced tritium from three analyses of the RLWTF effluent. *Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility* (LANL 1998c) (Zero Discharge Report) reported an average tritium concentration of 78,612 pCi/L in RLWTF effluent during 1996.

Strontium-90, cesium-137, and americium-241 in the RLWTF effluent is by-product material (i.e., reactor-produced) and is, therefore, regulated under the AEA and exempt from regulation under the CWA and NMWQCC regulations. Uranium in the RLWTF effluent may be subject to NMWQCC regulation if it is naturally occurring in the LANL source water supply; otherwise, it is source material and regulated under the AEA. Other isotopes in the RLWTF originate primarily from medical tracer and environmental monitoring research (LANL 1998f).

During 1998, a working group was established to study viable options for phased transition toward zero discharge of treated liquid waste from the RLWTF to Mortandad Canyon. The working group recommended several phases to accomplish its goal of zero discharge from the RLWTF and presented its recommendations in the Zero Discharge Report. Phase I upgrades to the RLWTF include installation of tubular ultrafiltration and reverse osmosis units. Phase II upgrades address nitrates with a biosystem to convert nitrates to nitrogen gas. The reduction of tritiated wastewaters; identification and minimization of other radioactive and hazardous constituents; and volume reduction were recommended for Phase III activities.

In support of the Zero Discharge Report Phase III recommendations, LANL's Environmental Safety and Health Division, Water Quality and Hydrology Group (ESH-18) and Environmental Management Division, Radioactive Liquid Waste Group (EM-RLW) sponsored a series of radioactive liquid waste minimization surveys of LANL facilities to identify generators and dischargers of tritium and accelerator-produced isotopes. This report presents the list of potential dischargers of tritium and accelerator-produced isotopes to the RLWTF either directly via the Radioactive Liquid Waste Collection System (RLWCS) or via collection and later transportation to the RLWTF.

2.0 GENERATORS OF TRITIUM AND ACCELERATOR-PRODUCED ISOTOPES

Several data sources were used to compile a list of generators that potentially discharge tritium and accelerator-produced isotopes to the RLWTF, including the following:

- Zero Discharge Report (LANL 1998c)

- *Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation Influent Design Basis* (LANL 1995b) (IDB)

- *1997 Radioactive Materials Usage Survey for Point Sources* (LANL 1998a) (Usage Survey) database query

- Correspondence with LANL personnel (e.g., telephone calls, electronic mail, interviews)

- Office of Nuclear Energy, Science and Technology web page (http://www.ne.doe.gov)

- LANL web page

- Previous surveys performed by ESH-18 and EM-RLW

- NPDES Database

The Zero Discharge Report identified the following major dischargers of liquid waste to the RLWTF during 1993:

- TA-3-29 Chemistry and Metallurgy Research facility
- TA-3-66 Sigma Building
- TA-48 Radiochemistry Site
- TA-53 Los Alamos Neutron Science Center (LANSCE) (discharge to the RLWTF has since discontinued)
- TA-55 Plutonium Facility
- TA-21 facilities
- Waste management facilities

The Tritium Systems Test Assembly (TSTA) facility and Tritium Science Fabrication Facility (TSFF) at TA-21 were reported to discharge the most tritium-contaminated waste to the RLWTF (LANL 1998c). The TSTA develops, demonstrates, and integrates technologies related to the deuterium-tritium fuel cycle for large-scale fusion reactor systems. The TSFF provides support for tritium-related experiments. Tritium sources from the TSTA and TSFF are primary coolant loop flushing, component washing, hand washing, cooling tower blow-down, and custodial activities. The cooling tower at TA-21 has since been replaced.

TAs 3, 35, 48, 50, and 59 were also identified in the Zero Discharge Report as dischargers of tritium to the RLWTF via the RLWCS. TAs 2, 16, 18, 33, 41, and 54 were reported to have collected tritium-contaminated waste and later transported it to the RLWTF. However, the contribution of tritium from these sources was estimated at only one percent of the total tritium activity sent to the RLWTF (LANL 1998c).

For the IDB, a generator survey was conducted to define each generator's existing waste disposal practices and any projected future activities that would affect their discharge to the RLWTF. The IDB was reviewed for LANL facilities that discharge tritium and accelerator-produced isotopes to the RLWTF.

The Usage Survey provides results of the 1997 Environmental Safety and Health Division, Air Quality Group (ESH-17) effort to collect information pertaining to radioactive materials usage and processes performed at LANL facilities. The Usage Survey included unmonitored point sources (UMSs) with a potential dose equivalent of greater than or equal to 0.005 mrem/yr (1/20th of the monitoring limit of 0.1 mrem/yr); new UMSs that began operating during 1997; or previously unidentified UMSs. A data retrieval from the Usage Survey database was provided by Scott Miller, ESH-17. This retrieval included the name of person interviewed, operating group, Facility Management Unit (FMU), TA, building, room, facility status, facility description, and radioactive material (or radionuclide) (RAM) discharged.

Additional information was collected from the results of previous surveys conducted by ESH-18 in 1995 and EM-RLW in 1997. The ESH-18 survey (LANL 1995a) stated all but two tritium discharges to the RLWCS were reactor-produced. One discharge of "very minute amounts" of accelerator-produced tritium was a result of contaminated glassware cleaning and hand washing at TA-21. The other discharge was a result of experiments performed at TA-21 to measure the amount of tritium gas produced from the Los Alamos Meson Physics Facility (now LANSCE) accelerator beam operation at TA-53.

The EM-RLW survey (LANL 1997) stated that TA-50-1 discharges accelerator-produced tritium as a result of monthly analysis of samples collected from the LANSCE at TA-53. These samples had an average volume of 200–300 mL, with a maximum of 400 mL, and an average concentration of 20 µCi/L, with a maximum concentration of 120 µCi/L. TA-48 was also reported to discharge accelerator-produced isotopes. A future research project at TA-21-209 was projected to generate accelerator-produced tritium.

A database query was made on the NPDES database that is managed by Anne Soukup, ESH Division Office. Only TA-21-155, Rooms 5512 and 5513 were identified as dischargers of tritiated water in the NPDES database.

Correspondence with TA-59 personnel has indicated that tritium calibration standards may be discharged from TA-59 to the RLWTF at a rate of approximately 10 to 25 nCi/yr. Accelerator-produced isotopes generated from sample or calibration standards may be discharged from TA-59 at a rate of approximately 1 to 2 nCi/yr.

Information obtained from the sources identified above was compiled into an Excel spreadsheet, which is included as Attachment 1 to this report. The information in Attachment 1 is sorted by TA, building, room, radionuclide, and whether the radionuclide was accelerator-produced at LANL. Although many isotopes identified in the IDB and Usage Survey have the potential to be accelerator-produced, depending upon the type of accelerator and target materials used, only those isotopes that were actually identified as having been accelerator-produced at LANL are identified as such. Information pertaining to all isotopes, regardless of whether they are accelerator-produced, is presented in Attachment 1.

Screening the information in Attachment 1 to identify only those facilities with the potential to discharge tritium and accelerator-produced isotopes to the RLWCS resulted in a much smaller data set, which is presented as Attachment 2. Attachment 2 also identifies group leaders for the facilities for additional information requests.

The Usage Survey was conducted to collect information on air emission sources. Generators identified in the Usage Survey were initially assumed to be connected to the RLWCS and have the potential to discharge the radionuclides identified to the RLWTF. Additional information was requested from the group leaders identified in Attachment 2 to determine whether those facilities do discharge to the RLWCS and whether the isotopes identified are indeed accelerator-produced. Only TA-59 provided additional information as discussed earlier.

Although LANSCE does not discharge to the RLWCS, samples are collected from LANSCE and are analyzed at other LANL facilities, including TAs 50, 48, and 59 that do discharge to the RLWTF. These samples may contain tritium and accelerator-produced isotopes. Some information regarding the potential accelerator-produced isotopes that are generated at LANSCE was obtained from the Office of Nuclear Energy, Science and Technology web page.

The DOE Office of Isotope Programs produces and sells stable and radioactive isotopes that are used by domestic and international customers for medicine, industry, and research. The LANSCE participates in this program by producing the isotopes shown in Table 2-1. The present Isotope Production Facility at LANL operates approximately 22 weeks per year. This facility produces radioisotopes using either the primary proton beam or neutrons from the beam stop of the LANSCE, a half-mile-long accelerator that delivers medium-energy protons. The unique characteristics of the LANSCE accelerator include a high-energy, high-beam current that allows production of higher quality radioisotopes as well as exotic radioisotopes that cannot be produced at other facilities.

The isotopes identified in Table 2-1 includes only those known to be generated for the isotope program and may not include all potential isotopes that are generated at LANSCE. Also note that only those isotopes that are known to be accelerator-produced and discharged to the RLWTF are presented as such in Attachment 1.

Due to LANSC facility modifications related to the primary laboratory mission, it will not be possible to produce these isotopes for research after Fiscal Year 1999, unless a new Los Alamos isotope production facility is built. Plans are under way to construct a new isotope production facility to allow continued and enhanced medical isotope production into the future. The new isotope production facility will permit eight months of isotope production annually and significantly reduce radioactive waste output. The DOE Office of Nuclear Energy, Science, and Technology web page also discussed construction of the Los Alamos target irradiation station; however, the physical location of the new facilities was not identified in the web page where this information was obtained. It is also unknown whether this facility plans to discharge to the RLWTF.

Table 2-1. LANSCE Accelerator-Produced Isotopes

Isotope[a,b,c]	Important Uses
Aluminum/Al-26	Research: Alzheimer's disease; acid rain
Americium/Am-241	Neutron source for oil well logging; smoke detectors (in LANSCE inventory)
Arsenic-72	Positron emitter with applications for medical imaging
Bismuth-207	Long-lived, photon-emitting isotope that is used as a tracer, as well as a source isotope
Cadmium/Cd-109	X-ray fluorescence instrument calibration; silver-109m generation (for short-term medical imaging)
Cobalt-55	Proposed to label monoclonal antibodies for positron emission tomography (PET)
Copper/Cu-67	Antibody labeling for cancer therapy and imaging
Germanium/Ge-68	Calibration source for PET scanners and equipment; antibody labeling
Iodine-124	Imaging agent
Palladium-103	Prostate cancer therapy
Silicon-32	Biological oceanography studies
Sodium/Na-22	Positron emitter used in various applications, neurologic research
Strontium/Sr-82 (parent of rubidium 82), Sr-85, and Sr-89	Cardiac PET imaging; diagnosis of bone lesions; hypoparathyroidism; bone cancer pain relief
Technetium-95m	Photon emitter that can be used in tracer studies of technetium migration in the environment and as a long-lived tracer for dosimetry and biodistribution studies
Technetium-99m (from molybdenum-99)	Diagnostic imaging

[a] Source: Office of Nuclear Energy, Science and Technology web page, http://www.ne.doe.gov

[b] LANSCE does not discharge to the RLWTF; however, other LANL facilities analyze samples collected from LANSCE that may contain the isotopes listed above.

[c] This list may not be all of the isotopes generated at LANSCE.

3.0 RECOMMENDED POLLUTION PREVENTION AND WASTE MINIMIZATION OPPORTUNITIES

Several pollution prevention and waste minimization (P2/WMin) opportunities were previously reported in the Zero Discharge Report, including the following:

- TSTA and TSFF liquid waste collection, storage, and later transfer to the radioactive wastewater lagoons located at TA-53 for evaporation until a planned treatment system is completed at TA-53
- TSTA and TSFF liquid waste collection, storage, and later transfer to a dedicated open-air evaporator for the TSTA and TSFF
- Other LANL facility (e.g., TA-16) liquid waste collection, storage, and later transfer to a dedicated open-air evaporator such as the TSTA and TSFF dedicated evaporator or to the TA-53 lagoons or solar evaporative unit
- Reuse of RLWTF effluent for industrial purposes, including plutonium processing at TA-55 and cooling towers

The Zero Discharge Report indicated that these P2/WMin opportunities would be viable provided waste analysis demonstrated compatibility of the constituents with the process and compliance with the *LANL Waste Acceptance Criteria* (LANL WAC) (LANL 1998e), Clean Air Act (CAA), Resource Conservation and Recovery Act (RCRA), and associated permits.

Based on the results of the present survey, the major identified sources of tritium and accelerator-produced isotope discharges to the RLWTF are from: 1) samples collected from LANSCE and other LANL facilities that are analyzed at TAs 48, 50, and 59; and 2) cleaning contaminated glassware and washing hands at TA-21 facilities. P2/WMin opportunities for these facilities include segregation and collection for discharge at the TA-53 treatment system or TA-54 treatment, storage, and disposal facilities (TSDFs). TA-59 personnel have indicated that unused samples from TA-53 are currently sent to TA-54 TSDFs for final disposition. Unused LANSCE samples that are analyzed at other LANL facilities should be handled in the same fashion.

Disposition at TA-53 or -54 must comply with LANL WAC, CAA, RCRA, and associated permit requirements, as applicable. Collection and storage of wastewater must be done in accordance with the requirements of *Hazardous and Mixed Waste Requirements for Storage* (LIR 404-00-03.0) to maintain compliance with RCRA requirements. Specifically, waste generators would need to coordinate with the facility waste management coordinator to register satellite accumulation areas and <90-day storage areas with the Environmental Safety and Health Hazardous and Solid Waste Group (ESH-19). Administrative and/or physical controls, volume and storage time, labeling, and secondary containment requirements must also be met, as applicable. In addition to the LIR 404-00-03.0 requirements, hazardous waste storage in areas not currently designated for such activities may require a review of the safety basis and/or authorization basis for the facility and possible unresolved safety question determinations, according to DOE Order 420.1, *Facility Safety*, prior to implementing storage.

4.0 REFERENCES

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20 NMAC 6.2 *New Mexico Administrative Code*, "New Mexico Water Quality Control Commission Regulations." Effective December 1, 1995. Santa Fe, New Mexico, New Mexico Water Quality Control Commission.

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33 U.S.C. 1251, et seq., as amended. *United States Code*, "Clean Water Act."

42 U.S.C. 2011 et seq., as amended. *United States Code*, "Atomic Energy Act."

U.S. Department of Energy Office of Nuclear Energy, Science and Technology web page (http://www.ne.doe.gov).

ATTACHMENT 1

Isotopes Generated at LANL

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	410	Research Laboratory	Active	Al-26	y	Dennis Phillips	CST-11	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Co-58	y	Dennis Phillips	CST-11	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Co-60	y	Dennis Phillips	CST-11	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Mn-54	y	Dennis Phillips	CST-11	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Na-22	y	Dennis Phillips	CST-11		Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Si-32	y	Dennis Phillips	CST-11	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
71	59	1	116	Occupational Health Laboratory	Active	H-3	y	George Brooks	CST-9	Analysis of TA-53 samples	Usage Survey (air)
66	21	3		DP Site West		S-35	n				IDB (water)
66	21	3		DP Site West		U-238	n				IDB (water)
66	50	69		WCRRF	Active	Am-241	n				IDB (water)
66	50	69		WCRRF	Active	Pu-238	n				IDB (water)
66	50	69		WCRRF	Active	Rb-83	n				IDB (water)
76	55	2		Laboratory Facility	Active	H3	n				IDB (water)
76	55	2		Laboratory Facility	Active	Pu-238	n				IDB (water)
76	55	2		Laboratory Facility	Active	U-235	n				IDB (water)
76	55	2		Laboratory Facility	Active	U-238	n				IDB (water)
76	55	4		Plutonium Facility	Active	Am-241	n				IDB (water)
76	55	4		Plutonium Facility	Active	Pu-239	n				IDB (water)
76	55	4		Plutonium Facility	Active	Uranium	n				IDB (water)
73	03	66	B100	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	B100	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	B101	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	B3	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	B3	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	B3	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	N/A	Sigma Building	Active	D-38	n	Philip Tubesing	MST-6		Usage Survey (air)
73	03	66	R100	Sigma Building	Active	D-38	n	Duncan Hammon	MST-6		Usage Survey (air)
73	03	66	R100	Sigma Building	Active	D-38	n	Duncan Hammon	MST-6		Usage Survey (air)
	16	205		Weapons Engineering Tritium Facility (WETF)		H-3	n				IDB (water)
66	21	116	N/A	Laboratory	Safe Shut-Down	Sr-90	n	Christopher Pulskamp	ESH-1	Laboratory facilities (soil and water samples)	Usage Survey (air)
66	21	116	N/A	Laboratory	Safe Shut-Down	Sr-90	n	Christopher Pulskamp	ESH-1	Laboratory facilities (soil and water samples)	Usage Survey (air)
66	21	116	N/A	Laboratory	Safe Shut-Down	Am-241	n	Christopher Pulskamp	ESH-1		Usage Survey (air)
66	21	116	N/A	Laboratory	Safe Shut-Down	Am-241	n	Christopher Pulskamp	ESH-1		Usage Survey (air)
66	21	116	N/A	Laboratory	Safe Shut-Down	Cs-137	n	Christopher Pulskamp	ESH-1		Usage Survey (air)
66	21	116	N/A	Laboratory	Safe Shut-Down	Cs-137	n	Christopher Pulskamp	ESH-1		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
	21	152		Tritium Salt Laboratory		Tritium oxide	n				IDB (water)
	21	155		Tritium Systems Test Assembly (TSTA)		H-3	n	Scott Willms		Fuel cycle fusion experiments, separation of tritium	IDB (water)
	21	155		Tritium Systems Test Assembly (TSTA)		Tritium oxide	n	Scott Willms		Fuel cycle fusion experiments, separation of tritium	IDB (water)
	21	209		Tritium Science and Fabrication Facility (TSFF)		H-3	n	Will Fox/Terry Buxton			IDB (water)
	21	209		Tritium Science and Fabrication Facility (TSFF)		Tritium oxide	n	Will Fox/Terry Buxton			IDB (water)
84	21	257	103	Rad Liquid Waste Disposal Facility	Active	Am-241	n	David Moss	EM-RLW		Usage Survey (air)
84	21	257	103	Rad Liquid Waste Disposal Facility	Active	Pu-238	n	David Moss	EM-RLW		Usage Survey (air)
84	21	257	103	Rad Liquid Waste Disposal Facility	Active	Pu-239	n	David Moss	EM-RLW		Usage Survey (air)
84	21	257	103	Rad Liquid Waste Disposal Facility	Active	U-234	n	David Moss	EM-RLW		Usage Survey (air)
84	21	257	103	Rad Liquid Waste Disposal Facility	Active	U-235	n	David Moss	EM-RLW		Usage Survey (air)
66	21	28	213	Laboratory	Active	Am-241	n	John Elliot	BSH-1		Usage Survey (air)
66	21	28	213	Laboratory	Active	Pu-239	n	John Elliot	BSH-1		Usage Survey (air)
	21	3		DP Site West		Tc-99	n				IDB (water)
66	21	5	505	Laboratory Building	Safe Shut-Down	Sr-90	n	Christopher Pulskamp	BSH-1	Laboratory facilities (soil and water samples)	Usage Survey (air)
66	21	5	505	Laboratory Building	Safe Shut-Down	Sr-90	n	Christopher Pulskamp	BSH-1	Laboratory facilities (soil and water samples)	Usage Survey (air)
66	21	5	505	Laboratory Building	Safe Shut-Down	Am-241	n	Christopher Pulskamp	BSH-1		Usage Survey (air)
66	21	5	505	Laboratory Building	Safe Shut-Down	Am-241	n	Christopher Pulskamp	BSH-1		Usage Survey (air)
66	21	5	505	Laboratory Building	Safe Shut-Down	Cs-137	n	Christopher Pulskamp	BSH-1		Usage Survey (air)
66	21	5	505	Laboratory Building	Safe Shut-Down	Cs-137	n	Christopher Pulskamp	BSH-1		Usage Survey (air)
	3	16		Ion Beam Facility	Safe Shut-Down	H-3	n	Stephanie Archuleta		Reactor produced, not accelerator produced	S. Archuleta
	3	16		Ion Beam Facility	Safe Shut-Down	Rb-86	n	Stephanie Archuleta		Reactor produced, not accelerator produced	IDB (water)
	3	32		Center for Material Sciences		Co-57	n				IDB (water)
	3	32		Center for Material Sciences		Fe-55	n				IDB (water)
66	46	158	107	Laser Induced Chemistry Lab	Active	D-38	n	David Morris	CST-4		Usage Survey (air)
66	46	158	107	Laser Induced Chemistry Lab	Active	D-38	n	David Morris	CST-4		Usage Survey (air)
66	46	158	107	Laser Induced Chemistry Lab	Active	Th-232	n	David Morris	CST-4		Usage Survey (air)
66	46	158	107	Laser Induced Chemistry Lab	Active	Th-232	n	David Morris	CST-4		Usage Survey (air)
66	46	158	107	Laser Induced Chemistry Lab	Active	U-nat	n	David Morris	CST-4		Usage Survey (air)
66	48	1	19A	Research Laboratory	Active	H-3	n	Joseph Thompson	CST-7	Counting standard for liquid scintillation counter	Usage Survey (air)
66	48	1	19A	Research Laboratory	Active	Cs-137	n	Joseph Thompson	CST-7		Usage Survey (air)
66	48	1	303	Research Laboratory	Active	Th-228	n	Malcolm Fowler	CST-11		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	304	Research Laboratory	Active	Be-7	n	Stephen Kung	CST-7	Geomaterial sorption experiments with RAMs	Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Sr-85	n	Stephen Kung	CST-7	Geomaterial sorption experiments with RAMs	Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Am-241	n	Stephen Kung	CST-7		Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Cs-137	n	Stephen Kung	CST-7		Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Np-237	n	Stephen Kung	CST-7		Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Pu-239	n	Stephen Kung	CST-7		Usage Survey (air)
66	48	1	304	Research Laboratory	Active	Pu-239	n	Stephen Kung	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Eu-152	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Lu-173	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Ni-63	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Tb-157	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Ce-141	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Ce-144	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	D-38	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Np-237	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Pu-239	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Th-229	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	Th-232	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	305	Research Laboratory	Active	U-238	n	Wolfgang Runde	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Bi-207	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Co-60	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Eu-152	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Sr-90	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Ba-133	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	D-38	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Ho-166m	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	Ra-226	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	U-238	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	306	Research Laboratory	Active	U-nat	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Co-60	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Co-60	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Mn-54	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Na-22	n	Rebecca Chamberlin	CST-11	Tracer solution	Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Sr-85	n	Rebecca Chamberlin	CST-11	Tracer solution	Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	307	Research Laboratory	Active	Cs-137	n	Rebecca Chamberlin	CST-11		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Co-60	n	Doug Ware	CST-7	Environmental samples containing fission products at different activity levels	Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Eu-152	n	Doug Ware	CST-7	Environmental samples containing fission products at different activity levels	Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Eu-154	n	Doug Ware	CST-7	Environmental samples containing fission products at different activity levels	Usage Survey (air)
66	48	1	308	Research Laboratory	Active	H-3	n	Doug Ware	CST-7	Environmental samples containing fission products at different activity levels	Usage Survey (air)
66	48	1	308	Research Laboratory	Active	H-3	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Tc-95m	n	Doug Ware	CST-7	Tracers made from stock solutions	Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Tc-99	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Am-241	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Am-243	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Am-243	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Ba-133	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cl-36	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Eu-155	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Pm-147	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Pu-239	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Pu-239	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Th-230	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	Th-232	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	U-233	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	U-233	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	U-233	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	308	Research Laboratory	Active	U-233	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	H-3	n	Doug Ware	CST-7		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	309	Research Laboratory	Active	H-3	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Se-75	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Se-75	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Sr-85	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Sr-85	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Tc-95m	n	Doug Ware	CST-7	Tracer solution at experimental levels	Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Am-241	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Am-243	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Ba-133	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Ba-133	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Cs-137	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Np-237	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	Pu-239	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-233	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	309	Research Laboratory	Active	U-nat	n	Doug Ware	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	H-3	n	Betty Strietelmeier	CST-7	Tracer solution	Usage Survey (air)
66	48	1	310	Research Laboratory	Active	H-3	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	H-3	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Tc-95m	n	Betty Strietelmeier	CST-7	Tracer stock solutions	Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Np-237	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Np-237	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	310	Research Laboratory	Active	U-233	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Bi-207	n	Malcolm Fowler	CST-11	Source preparation	Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Co-60	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Eu-152	n	Malcolm Fowler	CST-11	Source preparation	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	311/311A	Research Laboratory	Active	Ge-68	n	Malcolm Fowler	CST-11	Source preparation	Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Na-22	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	V-49	n	Malcolm Fowler	CST-11	Source preparation	Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Am-241	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Cf-252	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Cl-36	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Cs-137	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Cs-137	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Mo-93	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Pm-145	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Te-125m	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	Th-228	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	U-232	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	311/311A	Research Laboratory	Active	U-232	n	Malcolm Fowler	CST-11		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Bi-207	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cd-109	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Co-57	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ni-63	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Sr-90	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ti-44	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ti-44	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-241	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-241	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-241	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-241	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-241	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Am-243	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ba-133	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ba-133	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Bi-210	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cf-252	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cm-244	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cm-250	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Cs-137	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	D-38	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pb-210	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Pu-239	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Ra-224	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-229	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-229	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-232	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-232	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-232	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-232	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	Th-232	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	U-235	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	U-238	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	U-nat	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	312	Research Laboratory	Active	U-nat	n	Betty Strietelmeier	CST-7		Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Sr-82	n	David Vieira	CST-11	Mass separation to different isotopes	Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Sr-85	n	David Vieira	CST-11	Mass separation to different isotopes	Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Cs-135	n	David Vieira	CST-11		Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Cs-137	n	David Vieira	CST-11		Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Cs-137	n	David Vieira	CST-11		Usage Survey (air)
66	48	1	313	Research Laboratory	Active	Rb-82	n	David Vieira	CST-11		Usage Survey (air)
66	48	1	314	Research Laboratory	Active	Ge-68	n	Dick Heaton	CST-11	Medical isotopes	Usage Survey (air)
66	48	1	315	Research Laboratory	Active	Ge-68	n	Dick Heaton	CST-11	Medical isotopes	Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Bi-207	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Bi-207	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Cl-36	n	Carol Burns	CST-18		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	I-129	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Th-229	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Th-230	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	Th-230	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-233	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-236	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-238	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-238	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-nat	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	402	Research Laboratory	Active	U-nat	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Eu-152	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-95m	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-95m	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Am-241	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ba-133	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ca-45	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ca-45	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ce-141	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ce-144	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ni-66	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ru-106	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ru-106	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Ru-106	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	U-233	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	407	Research Laboratory	Active	Y-88	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Al-26	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Na-22	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Tc-95m	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	408	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11	Tracers and spiking solutions	Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Tc-99	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Ce-141	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Pm-145	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	408	Research Laboratory	Active	Pm-147	n	Norman Schroeder	CST-11		Usage Survey (air)
66	48	1	409	Research Laboratory	Active	D-38	n	Mark McCleskey	CST-18		Usage Survey (air)
66	48	1	409	Research Laboratory	Active	D-38	n	Mark McCleskey	CST-18		Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Ti-44	n	Dennis Phillips	CST-11		Usage Survey (air)
66	48	1	410	Research Laboratory	Active	P-32	n	Dennis Phillips	CST-11		Usage Survey (air)
66	48	1	410	Research Laboratory	Active	Pm-147	n	Dennis Phillips	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Co-60	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Tc-99	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	C-14	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Cs-137	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Cs-137	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Er-170	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Ho-166m	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Ho-166m	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Pt-193	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Pt-193	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Pu-239	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Sn-126	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Sn-126	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Sn-126	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Sn-126	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Tm-171	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Tm-171	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Uranium	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	411	Research Laboratory	Active	Yb-171	n	Geoff Miller	CST-11		Usage Survey (air)
66	48	1	412	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	412	Research Laboratory	Active	Th-232	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	412	Research Laboratory	Active	U-238	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	412	Research Laboratory	Active	U-238	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	413	Research Laboratory	Active	Tc-95m	n	Benjamin Warner	CST-18		Usage Survey (air)
66	48	1	413	Research Laboratory	Active	Cl-36	n	Benjamin Warner	CST-18		Usage Survey (air)
66	48	1	413	Research Laboratory	Active	Cs-137	n	Benjamin Warner	CST-18		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	414	Research Laboratory	Active	Bi-207	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Bi-207	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Co-58	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Co-58	n	Mike Cisneros	CST-11	Irradiated samples of nickel metal. Disposed as solid.	Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Co-58	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Eu-152	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Gd-150	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Ni-63	n	Mike Cisneros	CST-11	Irradiated samples of nickel metal. Disposed as solid.	Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Sr-90	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Sr-90	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-241	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-241	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-241	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-241	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-241	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-243	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-243	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-243	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Am-243	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cf-249	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-243	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-244	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-244	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-244	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-244	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-244	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cm-248	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cs-137	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cs-137	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Cs-137	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Np-237	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Np-237	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Np-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pa-233	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pb-210	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-236	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-236	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-236	n	Mike Cisneros	CST-11		Usage Survey (air)

Attachment I: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	414	Research Laboratory	Active	Pu-238	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-239	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Pu-242	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Th-232	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Th-232	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Th-232	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	Tl-204	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	U-232	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	414	Research Laboratory	Active	U-en	n	Mike Cisneros	CST-11		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	Am-241	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	Am-241	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	D-38	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	Th-232	n	Brandy Duran	CST-18		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	415	Research Laboratory	Active	Th-232	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	Th-232	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	415	Research Laboratory	Active	Th-232	n	Brandy Duran	CST-18		Usage Survey (air)
66	48	1	416	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	419	Research Laboratory	Active	Tc-97	n	Paul Dixon	CST-7		Usage Survey (air)
66	48	1	419	Research Laboratory	Active	Tc-99	n	Paul Dixon	CST-7		Usage Survey (air)
66	48	1	419	Research Laboratory	Active	Pu-239	n	Paul Dixon	CST-7		Usage Survey (air)
66	48	1	419	Research Laboratory	Active	Pu-242	n	Paul Dixon	CST-7		Usage Survey (air)
66	48	1	419	Research Laboratory	Active	U-nat	n	Paul Dixon	CST-7		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Am-241	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Am-243	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Cs-137	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Cs-137	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Np-237	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Np-237	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-236	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-238	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-239	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-239	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-239/Pu-240	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	Pu-244	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-232	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-236	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-236/U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-238	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-238	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-en	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	421	Research Laboratory	Active	U-en	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	423	Research Laboratory	Active	Sr-90	n	Jacek Dziewinski	CST-7	Scrap metal decon of lead augers and historic weapons tests	Usage Survey (air)
66	48	1	423	Research Laboratory	Active	Pu-239	n	Jacek Dziewinski	CST-7		Usage Survey (air)
66	48	1	423	Research Laboratory	Active	U-en	n	Jacek Dziewinski	CST-7		Usage Survey (air)
66	48	1	423	Research Laboratory	Active	U-nat	n	Jacek Dziewinski	CST-7		Usage Survey (air)
66	48	1	426	Research Laboratory	Active	D-38	n	Carol Burns	CST-18		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Tc-99	n	Kent Abney	CST-11	Hanford samples	Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Am-241	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Cm-250	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Cs-137	n	Kent Abney	CST-11		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	1	430	Research Laboratory	Active	D-38	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	D-38	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	D-38	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	D-38	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Ho-166m	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Pu-239	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	Sr-90	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	430	Research Laboratory	Active	U-233	n	Kent Abney	CST-11		Usage Survey (air)
66	48	1	4B	Research Laboratory	Active	Np-237	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	4B	Research Laboratory	Active	Pu-239	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	1	4B	Research Laboratory	Active	U-nat	n	Wes Efurd	CST-11		Usage Survey (air)
	48	1		Radiochemistry Laboratory		Al-26	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		As-73	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		As-74	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Be-7	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Bi-207	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Co-56	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Co-57	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Co-58	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Co-60	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Mn-54	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Na-22	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Nb-95	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Rb-83	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Rb-84	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Rh-101	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Rh-102	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Se-75	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Sr-85	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Sr-90	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Tc-99	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Ti-44	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		V-48	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		V-49	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Zn-65	n	Richard Keaton			IDB (water)
	48	1		Radiochemistry Laboratory		Zr-95	n	Richard Keaton			IDB (water)
66	48	1		Research Laboratory	Active	Be-10	n				IDB (water)
66	48	1		Research Laboratory	Active	Nb-95	n				IDB (water)
66	48	1		Research Laboratory	Active	U-234	n				IDB (water)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	45	E104A	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E104A	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E104B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E104B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E105	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E105	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E105	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E105	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E105	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E106A	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106A	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-239	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E106B	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	E107	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-97	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	E107	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-98	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	E107	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-99	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	E109	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E109	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E109	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E109	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	E109	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	45	B111	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B111	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B111	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B111	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B111	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-97	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Am-241	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-239	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	U-238	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	B113	Clean Chemistry and Mass Spectrometry Lab	Active	U-en	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N106	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N106	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N106	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N106	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N106	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	Am-241	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	Am-241	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-239	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-239	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Don Rokop	CST-7		Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	U-238	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	U-238	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	U-en	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N108	Clean Chemistry and Mass Spectrometry Lab	Active	U-en	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-97	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-98	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-99	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	Th-232	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	U-238	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N111	Clean Chemistry and Mass Spectrometry Lab	Active	WG-239	n	Don Rokop	CST-7		Usage Survey (air)
66	48	45	N113	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N113	Clean Chemistry and Mass Spectrometry Lab	Active	Ra-228	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N113	Clean Chemistry and Mass Spectrometry Lab	Active	Th-229	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N113	Clean Chemistry and Mass Spectrometry Lab	Active	U-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	N113	Clean Chemistry and Mass Spectrometry Lab	Active	U-236	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	W106	Clean Chemistry and Mass Spectrometry Lab	Active	Cl-36	n	June Fabryka-Martin	CST-7		Usage Survey (air)
66	48	45	W108	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-97	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	W108	Clean Chemistry and Mass Spectrometry Lab	Active	Tc-99	n	Jeff Roach	CST-7		Usage Survey (air)
66	48	45	W108	Clean Chemistry and Mass Spectrometry Lab	Active	Ba-133	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	W108	Clean Chemistry and Mass Spectrometry Lab	Active	Pa-233	n	Mike Murrell	CST-7		Usage Survey (air)
66	48	45	W110	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
66	48	45	W110	Clean Chemistry and Mass Spectrometry Lab	Active	Pu-242	n	Wes Efurd	CST-11		Usage Survey (air)
84	50	1		RLWTF	Active	H3	n				IDB (water)
84	50	1		RLWTF	Active	Pu-238	n				IDB (water)
84	50	1		RLWTF	Active	Pu-239	n				IDB (water)
84	50	1		RLWTF	Active	U-235	n				IDB (water)
84	50	1		RLWTF	Active	U-238	n				IDB (water)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
84	50	185	N/A	Lead Decontamination Trailer	Active	Sr-90	n	Myrna Romero	CST-7	Lead brick and sheeting decon	Usage Survey (air)
84	50	185	N/A	Lead Decontamination Trailer	Active	Sr-90	n	Myrna Romero	CST-7	Lead brick and sheeting decon	Usage Survey (air)
84	50	185	N/A	Lead Decontamination Trailer	Active	Am-241	n	Myrna Romero	CST-7		Usage Survey (air)
84	50	185	N/A	Lead Decontamination Trailer	Active	Am-241	n	Myrna Romero	CST-7		Usage Survey (air)
84	50	185	N/A	Lead Decontamination Trailer	Active	Cs-137	n	Myrna Romero	CST-7		Usage Survey (air)
84	50	185	N/A	Lead Decontamination Trailer	Active	Cs-137	n	Myrna Romero	CST-7		Usage Survey (air)
	50	69		Size Reduction Facility		Rb-83	n				IDB (water)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Co-60	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	H-3	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	H-3	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Am-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Pu-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Sr-89	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	215	N/A	Mixed Waste Storage Dome	Active	Y-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Am-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Am-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Cm-243	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Cm-244	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Pu-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	226	N/A	Retrieval Dome	Active	Pu-242	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Pu-244	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	Th-232	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	226	N/A	Retrieval Dome	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Be-7	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Co-56	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Co-57	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Co-60	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	H-3	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Mn-54	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Na-22	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Am-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Pu-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Pu-242	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Th-232	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	281	N/A	Low Level Waste Compactor	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	281	N/A	Low Level Waste Compactor	Active	Y-88	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Am-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Am-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Am-44	n	Sandra Gogol	EM-SWO	Probably Am-244. Waste storage. No discharge to RLWTF per S. Gogol 12/98	
64	54	33	N/A	Drum Vent System	Active	Cm-243	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Cm-243	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Cm-244	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	D-38	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-240	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Pu-242	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	Th-232	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	33	N/A	Drum Vent System	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-en	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-en	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-en	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-nat	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-nat	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-nat	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	33	N/A	Drum Vent System	Active	U-nat	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	H-3	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Sr-90	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Tc-99	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Am-241	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Cs-137	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Np-237	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Pa-233	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Pu-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Pu-239	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Th-232	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	Th-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	U-234	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	U-235	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
64	54	36	N/A	Drum Characterization	Active	U-238	n	Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	Usage Survey (air)
71	59	1	102	Occupational Health Laboratory	Active	Pu-242	n	Claudine Armenta	CST-9	Sample spike	
71	59	1	102	Occupational Health Laboratory	Active	U-nat	n	Edward Gonzalez	CST-9	Sample preparation	
71	59	1	102	Occupational Health Laboratory	Active	U-nat	n	Edward Gonzalez	CST-9	Sample preparation	
71	59	1	103	Occupational Health Laboratory	Active	Am-241	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	Am-241	n	Claudine Armenta	CST-9		

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Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	103	Occupational Health Laboratory	Active	Am-241	n	Claudine Armenta	CST-9	Spikes in reagent solutions	
71	59	1	103	Occupational Health Laboratory	Active	Am-243	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	103	Occupational Health Laboratory	Active	Am-243	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	103	Occupational Health Laboratory	Active	Am-243	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	Pu-238	n	Claudine Armenta	CST-9	Spikes in reagent solutions	
71	59	1	103	Occupational Health Laboratory	Active	Pu-242	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	103	Occupational Health Laboratory	Active	Pu-242	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	103	Occupational Health Laboratory	Active	Th-229	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	Th-229	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	Th-230	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	U-232	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	103	Occupational Health Laboratory	Active	U-236	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	U-236	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	U-236	n	Claudine Armenta	CST-9		
71	59	1	103	Occupational Health Laboratory	Active	U-nat	n	Claudine Armenta	CST-9	Isotope spikes	
71	59	1	104	Occupational Health Laboratory	Active	Am-243	n	Nancy Lujan	CST-9		
71	59	1	104	Occupational Health Laboratory	Active	Am-243	n	Nancy Lujan	CST-9	Tracer	
71	59	1	104	Occupational Health Laboratory	Active	U-232	n	Nancy Lujan	CST-9	Tracer	
71	59	1	104	Occupational Health Laboratory	Active	U-236	n	Nancy Lujan	CST-9		
71	59	1	104	Occupational Health Laboratory	Active	Uranium	n	Nancy Lujan	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Sr-85	n	Edward Gonzales	CST-9	Added to environmental samples	Usage Survey (air)
71	59	1	106	Occupational Health Laboratory	Active	Sr-90	n	Edward Gonzales	CST-9	Added to environmental samples	Usage Survey (air)
71	59	1	106	Occupational Health Laboratory	Active	Am-241	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Am-243	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Pu-238	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Pu-239	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Ra-228	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Th-230	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	Th-232	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	U-232	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	U-233	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	U-236	n	Edward Gonzales	CST-9		
71	59	1	106	Occupational Health Laboratory	Active	U-238	n	Edward Gonzales	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Ag-110	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Co-60	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Eu-152	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	H-3	n	George Brooks	CST-9	Isotope spike	Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	H-3	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	H-3	n	George Brooks	CST-9	Isotope spike	Usage Survey (air)

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	107	Occupational Health Laboratory	Active	Sr-90	n	George Brooks	CST-9	Isotope spike	Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Sr-90	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Sr-90	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Sr-90	n	George Brooks	CST-9	Isotope spike	Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Sr-90	n	George Brooks	CST-9		Usage Survey (air)
71	59	1	107	Occupational Health Laboratory	Active	Am-241	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Am-241	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Am-241	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Am-241	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Am-241	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	C-14	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	C-14	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	C-14	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cl-56	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-134	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Cs-137	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	D-38	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	I-131	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Pu-238	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-238	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9	Isotope spikes	
71	59	1	107	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Pu-242	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Ra-226	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Sr-89	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Th-230	n	George Brooks	CST-9		

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	107	Occupational Health Laboratory	Active	U-238	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	U-239	n	George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	Uranium	n	George Brooks	CST-9		
71	59	1	114	Occupational Health Laboratory	Active	Sr-85	n	Jeff Hodas	CST-9	Isotope spike	Usage Survey (air)
71	59	1	114	Occupational Health Laboratory	Active	Am-243	n	Jeff Hodas	CST-9		
71	59	1	114	Occupational Health Laboratory	Active	Pu-242	n	Jeff Hodas	CST-9		
71	59	1	114	Occupational Health Laboratory	Active	U-232	n	Jeff Hodas	CST-9		
71	59	1	114	Occupational Health Laboratory	Active	U-232	n	Jeff Hodas	CST-9		
71	59	1	116	Occupational Health Laboratory	Active	Pu-238	n	George Brooks	CST-9		
71	59	1	116	Occupational Health Laboratory	Active	Pu-239	n	George Brooks	CST-9		
71	59	1	118	Occupational Health Laboratory	Active	Co-57	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Co-57	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Co-60	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Co-60	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	H-3	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Mn-54	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Mn-54	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Na-22	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Na-22	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3	Standards to prepare QC samples	Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Sr-90	n	Nancy Koski	CST-3		Usage Survey (air)
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-241	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-243	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Am-243	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Cs-134	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Cs-134	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Cs-137	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Cs-137	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Cs-137	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	D-38	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	I-131	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pb-210	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pb-210	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-239	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-240	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-242	n	Nancy Koski	CST-3		

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	118	Occupational Health Laboratory	Active	Pu-242	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-242	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Pu-242	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Ra-226	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Ra-226	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Ra-226	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Ra-228	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Ra-228	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Th-229	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Th-229	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Th-230	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-238	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-en	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-en	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-en	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-nat	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-nat	n	Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	U-nat	n	Nancy Koski	CST-3		
71	59	1	130	Occupational Health Laboratory	Active	Kr-85	n	Ronald Scripsick	ESH-5		
71	59	1	180	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	182	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-241	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-241	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-241	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-241	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-241	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-243	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-243	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-243	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-243	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Am-243	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	D-38	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	D-38	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-238	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-238	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-239	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-239	n	Richard Peters	CST-9		

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Pu-242	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Ra-226	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Ra-226	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Th-230	n	Richard Peters	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Th-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Th-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Th-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	Th-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-232	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-234	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-235	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-236	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-238	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-238	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-nat	n	Steve Goldstein	CST-9		
71	59	1	184	Occupational Health Laboratory	Active	U-nat	n	Steve Goldstein	CST-9		
71	59	1	B8K	Occupational Health Laboratory	Active	H-3	n	Richard Robinson	CST-9	Tracer spiking solution	Usage Survey (air)
71	59	1	B8K	Occupational Health Laboratory	Active	H-3	n	Richard Robinson	CST-9	Tracer spiking solution	Usage Survey (air)
71	59	1	B8M	Occupational Health Laboratory	Active	Th-230	n	Richard Robinson	CST-9		
	59	1		Occupational Health Laboratory		Co-60	n				IDB (water)
	59	1		Occupational Health Laboratory		Sr-90	n				IDB (water)
66	48	1	19A	Research Laboratory	Active	Various		Joseph Thompson	CST-7		
66	48	1	311/311A	Research Laboratory	Active	Various		Malcolm Fowler	CST-11		
66	48	1	402	Research Laboratory	Active	Bi/Cl		Carol Burns	CST-18		
66	48	45	W108	Clean Chemistry and Mass Spectrometry Lab	Active	Various		Jeff Roach	CST-7		
	53			Los Alamos Neutron Science Center (LANSCE)						No discharge to RLWTF	
64	54	215	N/A	Mixed Waste Storage Dome	Active	Various		Sandra Gogol	EM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	

Attachment 1: Isotopes Generated at LANL

FMU	TA	Bldg	Room	Facility Description	Facility Status	RAM	Accel. Prod?	Interviewee	Group	Comments	Info source
64	54	226	N/A	Retrieval Dome	Active	MFP		Sandra Gogol	BM-SWO	Waste storage. No discharge to RLWTF per S. Gogol 12/98	
71	59	1	107	Occupational Health Laboratory	Active	Gamma		George Brooks	CST-9		
71	59	1	107	Occupational Health Laboratory	Active	U-Ti-alloy		George Brooks	CST-9		
71	59	1	109	Occupational Health Laboratory	Active	Various		Anthony Sanchez	CST-9		
71	59	1	110	Occupational Health Laboratory	Active	Various		Edward Gonzales	CST-9		
71	59	1	118	Occupational Health Laboratory	Active	Gamma		Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Gamma		Nancy Koski	CST-3		
71	59	1	118	Occupational Health Laboratory	Active	Gamma		Nancy Koski	CST-3		
71	59	1	189	Occupational Health Laboratory	Active	Various		Richard Robinson	CST-9		
71	59	1	190	Occupational Health Laboratory	Active	Various		Dianna Decker	CST-3		
71	59	1	B-4	Occupational Health Laboratory	Active	Various		Nancy Koski	CST-3		
71	59	1	B8D	Occupational Health Laboratory	Active	Various		Sammy Garcia	CST-9		
				Accelerator Operations and Technology Division							
				Accelerator Driven Transmutation Technologies							
				Advanced Free Electron Laser Accelerator							
				Accelerator Production of Tritium							

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ATTACHMENT 2

Tritium and Accelerator-Produced Isotopes

Attachment 2. Tritium and Accelerator-Produced Isotopes

FMU	TA	Bldg	Room	Group	Group Leader	email	Phone	Facility Description	RAM	Accel. Prod?	Interviewee	Comments	Info source
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Al-26	y	Dennis Phillips	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Co-58	y	Dennis Phillips	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Co-60	y	Dennis Phillips	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Mn-54	y	Dennis Phillips	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Na-22	y	Dennis Phillips		Usage Survey (air)
66	48	1	410	CST-11	Kimberly Thomas	kwthomas@lanl.gov	7-4379	Research Laboratory	Si-32	y	Dennis Phillips	Process and recovery of samples irradiated at LANSCE	Usage Survey (air)
71	59	1	116	CST-9	Jose Olivares	olivares@lanl.gov	5-5190	Occupational Health Laboratory	H-3	y	George Brooks	Analysis of TA-53 samples	Usage Survey (air)
	3	16						Ion Beam Facility	H-3	n	Stephanie Archuleta	Reactor produced, not accelerator produced	S. Archuleta
	16	205		ESA-TSM	Lawrie Eaton	leaton@lanl.gov	7-4434	Weapons Engineering Tritium Facility (WETF)	H-3	n			IDB (water)
	21	155		ESA-TSM	Lawrie Eaton	leaton@lanl.gov	7-4434	Tritium Systems Test Assembly (TSTA)	H-3	n	Scott Willms	Fuel cycle fusion experiments, separation of tritium	IDB (water)
	21	209		ESA-TSM	Lawrie Eaton	leaton@lanl.gov	7-4434	Tritium Science and Fabrication Facility (TSFF)	H-3	n	Will Fox/Terry Buxton		IDB (water)
66	48	1	19A	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Joseph Thompson	Counting standard for liquid scintillation counter	Usage Survey (air)
66	48	1	308	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Doug Ware	Environmental samples containing fission products at various activity levels	Usage Survey (air)
66	48	1	308	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Doug Ware		Usage Survey (air)
66	48	1	309	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Doug Ware		Usage Survey (air)
66	48	1	309	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Doug Ware		Usage Survey (air)
66	48	1	310	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Betty Strietelmeier	Tracer solution	Usage Survey (air)
66	48	1	310	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Betty Strietelmeier		Usage Survey (air)
66	48	1	310	CST-7	Ines Triay	triay@lanl.gov	5-1755	Research Laboratory	H-3	n	Betty Strietelmeier		Usage Survey (air)
84	50	1						RLWTF	H-3	n			IDB (water)
76	55	2						Laboratory Facility	H-3	n			IDB (water)
71	59	1	107	CST-9	Jose Olivares	olivares@lanl.gov	5-5190	Occupational Health Laboratory	H-3	n	George Brooks	Isotope spike	Usage Survey (air)
71	59	1	107	CST-9	Jose Olivares	olivares@lanl.gov	5-5190	Occupational Health Laboratory	H-3	n	George Brooks		Usage Survey (air)
71	59	1	107	CST-9	Jose Olivares	olivares@lanl.gov	5-5190	Occupational Health Laboratory	H-3	n	George Brooks	Isotope spike	Usage Survey (air)

EXH

AA

NPDES PERMIT NO. NM0028355
FACT SHEET

FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

APPLICANT: University of California
Management Contractor for Operations
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

and

U.S. Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

ISSUING OFFICE: U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

PREPARED BY: J. Scott Wilson
Environmental Scientist
NPDES Permits Branch (6WQ-P)
Water Quality Protection Division
VOICE: 214-665-7511
FAX: 214-665-2191
EMAIL: wilson.js@epa.gov

PERMIT ACTION: Proposed reissuance of the current permit issued June 24, 1994 with an effective date of August 1, 1994 and an expiration date of October 31, 1998.

DATE PREPARED: October 18, 1999

40CFR CITATIONS: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of 7/1/98.

STATE CERTIFICATION: The permit is in the process of certification by the State agency following regulations promulgated at 40CFR124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service; and to the National Marine Fisheries Service prior to the publication of that notice.

TRIBAL CERTIFICATION

Several Pueblos are located in the vicinity of Los Alamos National Laboratory. They include the following: San Ildefonso, Santa Clara, and Cochiti. The Santa Clara Pueblo has approved water quality standards; however, it is not adjacent to any stream where discharges are proposed to be authorized. Santa Clara is therefore not believed to be affected by the discharges proposed to be authorized by this permit. Neither San Ildefonso nor Cochiti Pueblo has approved water quality standards; therefore, no certification is required for this permit issuance.

ENDANGERED SPECIES ACT

EPA bas determined that issuance of this permit may affect but is only likely to beneficially affect any listed threatened or endangered species or designated critical habitat. Conditions proposed to be required by the reissued permit will result in a significant improvement in the quality of waste water the facility is authorized to discharge compared with the environmental baseline established by the previous permit. The draft permit also includes a significant reduction in the number of authorized discharges. EPA is seeking written concurrence with its decision from the United States Fish and Wildlife Service.

The last permit for this facility was issued on June 24, 1994 and expired October 31, 1998. Although the Fish and Wildlife Service did not make a determination as to the effects on listed threatened or endangered species by discharges authorized under it, the Service did support issuance of the permit because it increased the level of protection over the previous permit (Fowler-Propst, 1994). The State of New Mexico Environment Department also certified that the conditions required by the permit met the applicable state water quality standards and the water quality management plan (Piatt, 1994).

In many cases the limits included in the proposed permit are more stringent than those contained in the expired permit. The draft permit includes new site specific water quality standards based limits at each outfall for Chromium, Copper, Lead, and Zinc. Those limits were calculated based on the Total Suspended Solids concentrations of individual discharges. In the previous permit the limits were calculated using site-wide average values for Total Suspended Solids, which resulted in less stringent limitations. The proposed permit also incorporates more stringent limits for Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Tritium, and Zinc on all discharges. Those limits are based on State water quality standards which were promulgated after the previous permit was issued. New, more stringent limits are also proposed for high explosive waste water discharges. Those new limits for Total Toxic Organics and Trinitrotoluene will help to reduce the quantity of pollutants discharged and prevent future contamination from the discharges.

The number of discharges proposed to be authorized by the reissued permit is significantly decreased from the number authorized under the previous permit. 118 discharges which were authorized under the expired permit are not included in the proposed permit. Among those discharges not proposed to be authorized are 19 high explosive waste water discharges, 14 photo waste water discharges 75 cooling water discharges, 8 sanitary waste water discharges, 1 printed circuit board discharge, and 1 asphalt plant air scrubber discharge. This change will result in a significant decrease in the amount of pollutants which the permit authorizes to be discharged to receiving waters throughout the facility. As proposed, the permit will no longer authorize discharges to: Two Mile Canyon, Chaquehui Canyon, Pajarito Canyon, Ancho Canyon, Three Mile Canyon, Pueblo Canyon, Guaje Canyon, and Rendija Canyon. Following is a summary of the receiving streams and the number of discharges no longer proposed to be authorized.

Receiving Stream	**Number of Outfalls Deleted**
Los Alamos Canyon	18
Pajarito Canyon	16
Sandia Canyon	15
Water Canyon	15
Canada del Buey	12
Canon de Valle	11
Mortandad Canyon	11
Guaje Canyon	6
Two Mile Canyon	6
Ancho Canyon	2
Chaquehui Canyon	2
Three Mile Canyon	2
Pueblo Canyon	1
Rendija Canyon	1

The proposed permit also contains a new flow limit for the radioactive waste treatment plant which is designed to reduced the risk of erosion of potentially contaminated areas downstream.

Los Alamos National Laboratory has since made many changes in the management of its waste water. It has accomplished operational changes resulting in a significant decrease in the number of waste water discharges and has constructed new, more effective treatment systems for radioactive and industrial waste water and for high explosives waste water. Based on examination of these changes to the facility and analysis of the potential water quality impacts EPA has determined that reissuance of the permit may affect but is likely to result in beneficial affects for any threatened or endangered species or its critical habitat. The Agency is requesting concurrence with that determination from the U.S. Fish and Wildlife Service or in the absence of such concurrence initiation of formal consultation under the Endangered Species Act.

A Biological Evaluation for the facility's Habitat Management Plan has also previously been submitted to the U.S. Fish and Wildlife Service by Los Alamos National Laboratory. The U.S. Fish and Wildlife Service concurred on the Laboratory's determination that implementation of the Habitat Management Plan may affect , but is unlikely to adversely affect any threatened or endangered species (Fowler-Propst, 1999).

FINAL DETERMINATION: The public notice describes the procedures for the formulation of final determinations.

I. PROPOSED CHANGES FROM PREVIOUS PERMIT

It is proposed that the current permit be reissued for a 5-year term.

The changes from the current permit are:

(A) 105 Outfalls have been omitted. Discharge is not proposed to be authorized at those outfalls by the reissued permit.

(B) 13 potable water wells have been transferred to Los Alamos County and the associated discharges are not proposed to be authorized by the reissued permit.

(C) A maximum rate limitation has been added to the Radioactive Liquid Waste Treatment Facility discharge at Outfall 051. Mass limits were recalculated to correspond with the change.

(D) A new Outfall 03A199 has been added for the discharge of cooling tower blowdown.

(E) Limits for Total Toxic Organics and Trinitrotoluene have been added to the High Explosives Wastewater discharge at Outfall 05A055 and 05A097.

(F) Water Quality Standards based limits were recalculated based on current standards.

(G) Monitoring for Total Nitrogen, Nitrate-Nitrite (as N), and Ammonia Nitrogen (as N) at Outfall 051 is proposed to be removed from the permit.

(H) Limits for Total Residual Chlorine are proposed to replace limits for Free Available Chlorine at Outfalls 001, 03A021, 03A022, 03A024, 03A027, 03A028, 03A047, 03A048, 03A049, 03A113, 03A130, 03A158, 03A160, 03A181, 03A185, and 03A199.

The specific effluent limitations and/or conditions will be found in the draft permit.

II. APPLICANT ACTIVITY

Under the Standard Industrial Classification (SIC) Codes 9922, 9711, 9661, and 9611, the applicant currently operates a large multi-disciplinary facility which conducts national defense research and development, scientific research, space research and technology development, and energy development.

III. DISCHARGE LOCATION

As described in the application, the plant site is located in Los Alamos County, New Mexico. The discharges are to receiving waters named various ephemeral tributaries thence to the Rio Grande in Waterbody Segment Code No. 2-111 of the Rio Grande Basin. Those discharges are:

Tech. Area	Outfall Number	Receiving Stream
50-1	051	Mortandad Canyon
46-347	13S	Sandia Canyon or Canada del Buey
3-22	001	Sandia Canyon
3-29	03A021	Mortandad Canyon
3-127	03A022	Mortandad Canyon
3-187	03A024	Sandia Canyon
3-285	03A027	Sandia Canyon
11-30	03A130	Water Canyon
11-52	05A097	Water Canyon
15-202	03A028	Water Canyon
15-312	03A185	Water Canyon
16-1508	05A055	Canon de Valle
21-209	03A158	Los Alamos Canyon
21-357	02A129	Los Alamos Canyon
53-293, 294, 1032, and LEDA	03A113	Sandia Canyon
35-124	03A160	Ten Site Canyon
53-60	03A047	Los Alamos Canyon
53-62	03A048	Los Alamos Canyon
53-64	03A049	Los Alamos Canyon
55-6	03A181	Mortandad Canyon
3-1837	03A199	Sandia Canyon

IV. RECEIVING WATER USES

The known uses of the receiving water(s) are:

(WATERBODY SEGMENT CODE NO. 2-111)
Livestock Watering
Wildlife Habitat

V. STREAM STANDARDS

The general and specific stream standards are provided in "Water Quality Standards for Interstate and Intrastate Streams in New Mexico," (20NMAC6.1, effective 1/23/95).

VI. DISCHARGE DESCRIPTION

A quantitative description of the discharge(s) described in the EPA Permit Application Forms 1, 2C and 2D dated April 30, 1998 and discharge monitoring report data is presented in Appendix A.

VII. TENTATIVE DETERMINATION

On the basis of preliminary staff review and after consultation with the State of New Mexico, the Environmental Protection Agency has made a tentative determination to reissue a permit for the discharge described in the application.

VIII. DRAFT PERMIT RATIONALE

The following section sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other necessary explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guideline or performance standard provisions as required under 40CFR122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

A. TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Following regulations promulgated at 40CFR122.44(l)(2)(ii), the draft permit limits are based on either technology-based effluent limits pursuant to 40CFR122.44(a) or on State water quality standards and requirements pursuant to 40CFR122.44(d), whichever are more stringent.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

Regulations promulgated at 40CFR122.44(a) require technology-based effluent limitations to be placed in NPDES permits based on effluent limitations guidelines where applicable, on BPJ (best professional judgment) in the absence of guidelines, or on a combination of the two.

For most outfalls, the technology based effluent limitations from the expired permit are retained in the proposed permit. A summary of those limits follows:

Outfall 001 (Power Plant Effluent)

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Free Available Chlorine *	0.2 mg/l	0.5 mg/l
pH range:	6.0 to 9.0 standard units	

Outfall 02A129 (neutralized demineralizer regeneration brine and boiler blowdown)

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Total Iron	10 mg/l	40 mg/l
Total Phosphorus	20 mg/l	40 mg/l
Sulfite (as SO_3)	35 mg/l	70 mg/l
pH range:	6.0 to 9.0 standard units	

Outfall Type 03A (Treated Cooling Water)

Includes Outfalls: 03A021, 03A022, 03A024, 03A027, 03A028, 03A047, 03A048, 03A049, 03A113, 03A130, 03A158, 03A160, 03A181, 03A185, and 03A199

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Total Phosphorus	20 mg/l	40 mg/l
Free Available Chlorine *	0.2 mg/l	0.5 mg/l
pH range:	6.0 to 9.0 standard units	

Outfall Type 05A (High Explosives Waste Water)

Includes Outfalls: 05A055 and 05A097

	Monthly Average	Daily Maximum

Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Oil & Grease	15 mg/l	15 mg/l
pH range:	6.0 to 9.0 standard units	

Outfall 13S (Sanitary Waste Water)

	Monthly Average	Daily Maximum
Biochemical Oxygen Demand (5-day)	30 mg/l	45 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Fecal Coliform (colonies/100ml)	500	500
pH range:	6.0 to 9.0 standard units	

Outfall 051 (Radioactive and Industrial Waste Water)

	Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Total Chromium	1.34 mg/l	2.68 mg/l
Total Iron	7.053 mg/l	14.106 mg/l
Total Lead	0.423 mg/l	N/A
Total Zinc	4.37 mg/l	8.75 mg/l
pH range:	6.0 to 9.0 standard units	

* Limits for Free Available Chlorine are proposed to be changed to Total Residual Chlorine.

2. CHANGES FROM PREVIOUS PERMIT

Mass Limits

The previous permit contained mass limits at Outfalls 13S and 051. Outfall 051 is proposed to have a new limit for flow. The new flow limits and calculation of mass limits for Outfall 051 are discussed later in this Fact Sheet. Biochemical Oxygen Demand and Total Suspended Solids were limited by mass in the expired permit and are again proposed to be limited by mass. The new mass limits were calculated based on the long term average flow reported on Discharge Monitoring Reports for Outfall 13S. The new limits were calculated as follows:

Biochemical Oxygen Demand

Monthly Avg.	= 0.2883 MGD * 8.34 * 30 mg/l	=	72 lbs/day
Daily Max.	= 0.2883 MGD * 8.34 * 45 mg/l	=	108 lbs/day

Total Suspended Solids

Monthly Avg.	= 0.2883 MGD * 8.34 * 30 mg/l	=	72 lbs/day
Daily Max.	= 0.2883 MGD * 8.34 * 45 mg/l	=	108 lbs/day

The previous permit contained mass limits at Outfall 051 for: Chemical Oxygen Demand, Total Suspended Solids, Total Cadmium, Total Chromium, Total Copper, Total Iron, Total Lead, Total Mercury, and Total Zinc. The limits were recalculated based on the facility's present flow rates. The new proposed limits were calculated as follows:

Chemical Oxygen Demand

Monthly Avg.	= 0.0247 MGD * 8.34 * 125 mg/l	=	25.75 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 125 mg/l * 1.5	=	38.6 lbs/day

Total Suspended Solids

Monthly Avg.	= 0.0247 MGD * 8.34 * 30 mg/l	=	6.18 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 45 mg/l	=	9.27 lbs/day

Total Cadmium

Monthly Avg.	= 0.0247 MGD * 8.34 * 0.05 mg/l	=	0.01 lbs/day **
Daily Max.	= 0.0247 MGD * 8.34 * 0.05 mg/l * 1.5	=	0.015 lbs/day **

Total Chromium

Monthly Avg.	= 0.0247 MGD * 8.34 * 1.34 mg/l	=	0.276 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 2.68 mg/l	=	0.552 lbs/day

Total Copper

Monthly Avg.	= 0.0247 MGD * 8.34 * 1.393 mg/l	=	0.287 lbs/day **
Daily Max.	= 0.0247 MGD * 8.34 * 1.393 mg/l * 1.5	=	0.43 lbs/day **

Total Iron

Monthly Avg.	= 0.0247 MGD * 8.34 * 7.05 mg/l	=	1.45 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 14.1 mg/l	=	2.9 lbs/day

Total Lead

Monthly Avg.	= 0.0247 MGD * 8.34 * 0.423 mg/l	=	0.87 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 0.524 mg/l * 1.5	=	0.162 lbs/day **

Total Mercury

Monthly Avg.	= 0.0247 MGD * 8.34 * 0.012 mg/l	=	1.12 mg/day **
Daily Max.	= 0.0247 MGD * 8.34 * 0.012 mg/l * 1.5	=	1.68 lbs/day **

Total Zinc

Monthly Avg.	= 0.0247 MGD * 8.34 * 4.37 mg/l	=	0.9 lbs/day
Daily Max.	= 0.0247 MGD * 8.34 * 8.75 mg/l	=	1.8 lbs/day

** Denotes a water quality based limit. Derivation of the water quality based concentration limits used above is explained later in this Fact Sheet.

Outfall Reduction Program

Los Alamos National Laboratory has conducted an outfall reduction program which consists of eliminating waste water sources, re-piping waste water drainage systems, recirculation, modification or installation of equipment, and plugging floor drains. The permittee has also constructed the Sanitary Wastewater System Facility which treats waste water formerly discharged at nine different outfalls. Treated sanitary waste water is now reused as cooling water at the power plant prior to discharge at Outfall 01A001. This change has resulted in elimination of eight sanitary outfalls and 32 septic tank systems. Waste minimization efforts have resulted in a significant decrease in the volume of high explosives waste water discharged. Los Alamos National Laboratory has also constructed a new High Explosives Wastewater Treatment Facility which has facilitated elimination of nineteen outfalls that formerly discharged waste water from high explosives research and development, decontamination and decommissioning, environmental restoration, and waste minimization projects.

Through the outfall reduction program photo waste discharges, asphalt plant discharges, and photo etching discharges from printed circuit board manufacturing have also been eliminated and are not proposed to be authorized under the reissued permit. A summary of the outfalls proposed to remain in the reissued permit and those which have been eliminated from the expired permit follows:

Outfall Categories

001	Power Plant Discharge
02A	Neutralized demineralizer regeneration brine and boiler blowdown
03A	Cooling tower blowdown, evaporative coolers, chillers, condensers, and air washer blowdown
04A	Non-contact cooling water, non-destructive testing discharge, and production facilities
05A	High explosive waste discharge
S	Sanitary wastewater
051	Industrial wastewater treatment plant

Remaining Outfalls

	Outfall Number	TA/ Building	Description
1.	051	50-1	Radiochemistry lab waste water, duct wash, decontamination and demolition waste water, mop and cleaning waters, environmental restoration liquid wastes, photo rinse water, boiler and equipment room process water, and storm water from secondary containment structures
2.	13S	46-347	Sanitary waste water
3.	001	3-22	Power Plant boiler blowdown/cooling water and sanitary reuse waste water
4.	02A129	21-357	Steam Plant boiler blowdown, demineralizer regeneration water, environmental tank washings, and once through cooling water
5.	03A021	3-29	Chemistry and Metallurgy cooling system air wash
6.	03A022	3-127	Cooling tower blowdown
7.	03A024	3-187	Cooling tower blowdown
8.	03A027	3-285	Cooling tower blowdown and fire protection water
9.	03A028	15-202	Cooling tower blowdown and other de minimus waste streams
10.	03A047	53-60	Cooling tower blowdown and other de minimus waste streams
11.	03A048	53-62	Cooling tower blowdown and other de minimus waste streams
12.	03A049	53-64	Cooling tower blowdown and other de minimus waste streams
13.	03A113	53-293, 294, 1032, and LEDA	Cooling tower blowdown
14.	03A130	11-30	Cooling tower blowdown and other de minimus waste streams
15.	03A158	21-209	Cooling tower blowdown and other de minimus waste streams
16.	03A160	35-124	Cooling tower blowdown and floor washings
17.	03A181	55-6	Cooling tower blowdown
18.	03A185	15-312	Cooling tower blowdown
19.	03A199	3-1837	Cooling tower blowdown
20.	05A055	16-1508	Process waste water from high explosives research and development, decontamination and decommissioning, environmental restoration, and waste minimization projects
21.	05A097	11-25	Wash water from high explosives testing drop pad

Outfalls Deleted

	Outfall Number	TA/ Building	Discharge To	Type
1.	03A114	53-2	Sandia Canyon	Treated Cooling Water

2.	03A124	46-169	Canada del Buey	Treated Cooling Water
3.	03A125	53-28	Sandia Canyon	Treated Cooling Water
4.	03A136	46-200	Canada del Buey	Treated Cooling Water
5.	03A145	53-6	Sandia Canyon	Treated Cooling Water
6.	03A146	53-14	Sandia Canyon	Treated Cooling Water
7.	03A148	3-1498, 1807	Sandia Canyon	Treated Cooling Water
8.	03A184	53-17	Sandia Canyon	Treated Cooling Water
9.	03A009	3-102	Two Mile Canyon	Treated Cooling Water
10.	03A020	2-49	Los Alamos Canyon	Treated Cooling Water
11.	03A023	3-156	Sandia Canyon	Treated Cooling Water
12.	03A025	3-208	Two Mile Canyon	Treated Cooling Water
13.	03A031	21-143	Los Alamos Canyon	Treated Cooling Water
14.	03A032	21-150	Los Alamos Canyon	Treated Cooling Water
15.	03A034	21-166, 167	Los Alamos Canyon	Treated Cooling Water
16.	03A035	21-210	Los Alamos Canyon	Treated Cooling Water
17.	03A036	21-152, 155, 220	Los Alamos Canyon	Treated Cooling Water
18.	03A037	21-314	Los Alamos Canyon	Treated Cooling Water
19.	03A038	33-114	Chaquehui Canyon	Treated Cooling Water
20.	03A040	43-1	Los Alamos Canyon	Treated Cooling Water
21.	03A042	46-1	Canada del Buey	Treated Cooling Water
22.	03A043	46-31	Canada del Buey	Treated Cooling Water
23.	03A045	48-1	Mortandad Canyon	Treated Cooling Water
24.	03A060	16-430	Water Canyon	Treated Cooling Water
25.	03A098	59-1	Two Mile Canyon	Treated Cooling Water
26.	04A013	46-30	Canada del Buey	Non-Contact Cooling Water
27.	04A014	46-88	Canada del Buey	Non-Contact Cooling Water
28.	04A016	48-1	Mortandad Canyon	Non-Contact Cooling Water
29.	04A018	46-24, 59, 76	Canada del Buey	Non-Contact Cooling Water
30.	04A070	16-220	Canon de Valle	Non-Contact Cooling Water
31.	04A083	16-202	Water Canyon	Non-Contact Cooling Water
32.	04A091	16-450	Water Canyon	Non-Contact Cooling Water
33.	04A092	16-370	Water Canyon	Non-Contact Cooling Water
34.	04A093	15-R203	Canon de Valle	Non-Contact Cooling Water
35.	04A094	3-170	Sandia Canyon	Non-Contact Cooling Water
36.	04A101	40-9	Pajarito Canyon	Non-Contact Cooling Water
37.	04A115	8-70	Pajarito Canyon	Non-Contact Cooling Water
38.	04A117	46-41	Canada del Buey	Non-Contact Cooling Water
39.	04A118	Pajarito #4	Canada del Buey	Non-Contact Cooling Water
40.	04A126	48-8	Mortandad Canyon	Non-Contact Cooling Water
41.	04A127	35-213	Mortandad Canyon	Non-Contact Cooling Water
42.	04A131	48-1	Mortandad Canyon	Non-Contact Cooling Water
43.	04A135	53-18	Sandia Canyon	Non-Contact Cooling Water
44.	04A137	48-46	Mortandad Canyon	Non-Contact Cooling Water

45.	04A139	15-184	Water Canyon	Non-Contact Cooling Water
46.	04A140	3-141	Mortandad Canyon	Non-Contact Cooling Water
47.	04A141	39-69	Ancho Canyon	Non-Contact Cooling Water
48.	04A142	21-5, 149	Los Alamos Canyon	Non-Contact Cooling Water
49.	04A143	15-306	Three Mile Canyon	Non-Contact Cooling Water
50	04A147	33-86	Chaquehui Canyon	Non-Contact Cooling Water
51.	04A151	3-22	Sandia Canyon	Non-Contact Cooling Water
52.	04A152	48-28	Mortandad Canyon	Non-Contact Cooling Water
53.	04A153	48-1	Mortandad Canyon	Non-Contact Cooling Water
54.	04A155	9-50	Pajarito Canyon	Non-Contact Cooling Water
55.	04A156	39-89	Ancho Canyon	Non-Contact Cooling Water
56.	04A157	16-460	Water Canyon	Non-Contact Cooling Water
57.	04A161	Otowa #1	Pueblo Canyon	Non-Contact Cooling Water
58.	04A163	Pajarito #1	Sandia Canyon	Non-Contact Cooling Water
59.	04A164	Pajarito #2	Pajarito Canyon	Non-Contact Cooling Water
60.	04A165	Pajarito #3	Sandia Canyon	Non-Contact Cooling Water
61.	04A166	Pajarito #5	Canada del Buey	Non-Contact Cooling Water
62.	04A167	LA Well #1B	Los Alamos Canyon	Non-Contact Cooling Water
63.	04A168	LA Well #2	Los Alamos Canyon	Non-Contact Cooling Water
64.	04A169	LA Well #3	Los Alamos Canyon	Non-Contact Cooling Water
65.	04A170	LA Well #5	Los Alamos Canyon	Non-Contact Cooling Water
66.	04A171	Guaje #1	Guaje Canyon	Non-Contact Cooling Water
67.	04A172	Guaje #1A	Guaje Canyon	Non-Contact Cooling Water
68.	04A173	Guaje #2	Guaje Canyon	Non-Contact Cooling Water
69.	04A174	Guaje #4	Guaje Canyon	Non-Contact Cooling Water
70.	04A175	Guaje #5	Guaje Canyon	Non-Contact Cooling Water
71.	04A176	Guaje #6	Rendija Canyon	Non-Contact Cooling Water
72.	04A177	Guaje Booster #1	Guaje Canyon	Non-Contact Cooling Water
73.	04A178	LA Booster 1	Los Alamos Canyon	Non-Contact Cooling Water
74.	04A182	21-1003	Los Alamos Canyon	Non-Contact Cooling Water
75.	04A186	Otowi Well #4	Los Alamos Canyon	Non-Contact Cooling Water
76.	05A052	16-380	Water Canyon	High Explosive Waste Water
77.	05A053	16-410	Water Canyon	High Explosive Waste Water
78.	05A054	16-340	Canon de Valle	High Explosive Waste Water
79.	05A056	16-260	Canon de Valle	High Explosive Waste Water
80.	05A057	16-265	Canon de Valle	High Explosive Waste Water
81.	05A058	16-300 - 306	Water Canyon	High Explosive Waste Water
82.	05A061	16-280	Canon de Valle	High Explosive Waste Water
83.	05A062	16-342	Canon de Valle	High Explosive Waste Water
84.	05A063	16-400	Canon de Valle	High Explosive Waste Water
85.	05A066	9A-21, 28, 29, 32, 35, 37, 38, & 40	Pajarito Canyon	High Explosive Waste Water

86.	05A067	9B-41, 42, 43, 45, & 46	Pajarito Canyon	High Explosive Waste Water
87.	05A068	9-48	Pajarito Canyon	High Explosive Waste Water
88.	05A069	11-50	Water Canyon	High Explosive Waste Water
89.	05A071	16-430	Water Canyon	High Explosive Waste Water
90.	05A072	16-460	Water Canyon	High Explosive Waste Water
91.	05A096	11-51	Water Canyon	High Explosive Waste Water
92.	05A149	16-267	Canon de Valle	High Explosive Waste Water
93.	05A154	40-41	Two Mile Canyon	High Explosive Waste Water
94.	05A159	16-360	Water Canyon	High Explosive Waste Water
95.	128 128	22-91	Pajarito Canyon	Printed Circuit Board Mfg
96.	02S	TA-9	Sandia Canyon	Sanitary Wastewater
97.	03S	TA-16	Water Canyon	Sanitary Wastewater
98.	04S	TA-18	Pajarito Canyon	Sanitary Wastewater
99.	05S	TA-21 STF	Los Alamos Canyon	Sanitary Wastewater
100.	07S	TA-46N	Canada del Buey	Sanitary Wastewater
101.	09S	TA-53	Los Alamos Canyon	Sanitary Wastewater
102.	10S	TA-35	Mortandad Canyon	Sanitary Wastewater
103.	12S	TA-46S	Canada del Buey	Sanitary Wastewater
104.	06A073	16-222	Canon de Valle	Photo Waste Discharge
105.	06A074	8-22	Pajarito Canyon	Photo Waste Discharge
106.	06A075	8-21	Pajarito Canyon	Photo Waste Discharge
107.	06A078	22-34	Two Mile Canyon	Photo Waste Discharge
108.	06A079	40-4	Pajarito Canyon	Photo Waste Discharge
109.	06A080	40-5	Pajarito Canyon	Photo Waste Discharge
110.	06A081	40-8	Pajarito Canyon	Photo Waste Discharge
111.	06A082	40-12	Pajarito Canyon	Photo Waste Discharge
112.	06A099	40-23	Two Mile Canyon	Photo Waste Discharge
113.	06A100	40-15	Pajarito Canyon	Photo Waste Discharge
114.	06A106	36-1	Three Mile Canyon	Photo Waste Discharge
115.	06A123	15-R183	Canon de Valle	Photo Waste Discharge
116.	06A132	35-87	Mortandad Canyon	Photo Waste Discharge
117.	06A183	3-510	Sandia Canyon	Photo Waste Discharge
118.	07A109	3-73	Sandia Canyon	Asphalt Plant Air Scrubber Wash Water

New Technology Based Limitations

Examination of the existing technology-based permit limits revealed that the limits at most outfalls are representative of the Best Available Technology Economically Achievable (BAT). The exception to this is at the High Explosives Wastewater Treatment Facility discharge (Outfall 05A055 and 05A097). This outfall is limited in the expired permit only for the technology based parameters of Chemical Oxygen Demand, Total Suspended Solids, and Oil & Grease. These parameters are not deemed to be sufficiently representative of the pollutants expected to be present in the effluent treated at the facility. Additionally, since the permittee has added a new, more advanced treatment system composed of flocculation, sedimentation, slow sand filtration, carbon absorption, and neutralization, it is appropriate to establish new BAT for the outfall with this permit reissuance. It is proposed that the reissued permit contain monthly average and daily maximum limits of 1 mg/l for Total Toxic Organics. These limits are consistent with those at the radioactive and industrial waste treatment facility (Outfall 051). Total Toxic Organics limits based on the Metal Finishing Point Source Category Effluent Limitations Guidelines (40 CFR 433.11) includes a broad spectrum of organic compounds, many of which may be present in the high explosives waste stream. New limits for Trinitrotoluene are also proposed to be added to Outfall 05A055 and 05A097. Trinitrotoluene is also expected to be present in the high explosives waste stream. The proposed limits for Trinitrotoluene are based on those established in the NPDES permit for the Louisiana Army Ammunition Plant which is operated by the Thiokol Corporation (Permit No. LA0003549).

Los Alamos National Laboratory has requested a change in Chlorine limits from Free Available Chlorine to Total Residual Chlorine at Outfall 001 and outfall category 03A (cooling tower blowdown). The category 03A outfalls are: 03A021, 03A022, 03A024, 03A027, 03A028, 03A047, 03A048, 03A049, 03A113, 03A130, 03A158, 03A160, 03A181, 03A185, and 03A199. This change is appropriate because the results produced by the test method for Total Residual Chlorine are not affected by many of the contaminants which affect the results of the Free Available Chlorine test method. Since the change in test method may produce more reliable results and will not result in a less stringent limit, it has been made in the draft permit.

3. MONITORING FREQUENCIES FOR LIMITED PARAMETERS

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity [40CFR122.48(b)] and to assure compliance with permit limitations [40CFR122.44(i)(1)].

The draft permit establishes a monitoring frequency of based on current permit requirements.

C. WATER QUALITY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

Effluent limitations and/or conditions established in the draft permit are in compliance with State water quality standards and the applicable water quality management plan.

2. POST THIRD ROUND POLICY AND STRATEGY

Section 101 of the Clean Water Act (CWA) states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited..." To insure that the CWA's prohibitions on toxic discharges are met, EPA has issued a "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants (49 FR 9016-9019, 3/9/84)." In support of the national policy, Region 6 adopted the "Policy for Post Third Round NPDES Permitting" and the "Post Third Round NPDES Permit Implementation Strategy" on October 1, 1992. The Regional policy and strategy are designed to insure that no source will be allowed to discharge any wastewater which (1) results in instream aquatic toxicity; (2) causes a violation of an applicable narrative or numerical State water quality standard resulting in nonconformance with the provisions of 40CFR122.44(d); (3) results in the endangerment of a drinking water supply; or (4) results in aquatic bioaccumulation which threatens human health.

3. IMPLEMENTATION

The Region is currently implementing its post third round policy (Appendix E) in conformance with the Regional strategy (Appendix F). The 5-year NPDES permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the NPDES permits. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

4. STATE WATER QUALITY NUMERICAL STANDARDS

a. GENERAL COMMENTS

As described earlier in this Fact Sheet, Los Alamos National Laboratory discharges to Canada del buey, Los Alamos Canyon, Mortandad Canyon, Sandia Canyon, Ten Site Canyon, Water Canyon, and Canon de Valle. All of the receiving streams are ephemeral and intermittent in nature; thus, State aquatic life criteria do not apply. The facility's discharges, most of which are also intermittent in nature, are located from 7.5 to 14.3 miles from the Rio Grande. They do not generally reach the Rio Grande, except as the result of precipitation events. Because of this, only the State standards for livestock watering, wildlife habitat, and general water quality standards apply to the discharges which will be authorized by the proposed permit.

b. PERMIT ACTION

Water Quality Standards based limits for: Aluminum, Arsenic, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Selenium, Vanadium, Zinc, Radium 226+228, and Tritium (when accelerator produced) were included in the expired permit and are proposed to be continued in the reissued permit. In some cases the limits have been revised to comply with the most recent water quality standards. Since the receiving streams are intermittent in nature, no in-stream dilution was used to calculate the proposed limits. They were calculated based on 100% effluent. Outfall specific limits based on the dissolved to total fraction for Arsenic, Chromium, Copper, Lead, and Zinc were recalculated using Total Suspended Solids (TSS) data included in the permit application. Those calculations can be found in Appendix B1 of this Fact Sheet. The previous permit contained limits based on an average TSS concentration for the facility. Since the TSS concentration is reported to be fairly variable in different effluents at the facility, outfall specific limits will better ensure compliance with State water quality standards.

RADIOACTIVE MATERIALS

The Atomic Energy Act regulates three types of radioactive materials: source, byproduct, and special nuclear materials. Under that Act, the Nuclear Regulatory Commission is authorized to regulate the discharge of those radioactive materials. The Environmental Protection Agency does not have authority, under the Clean Water Act, to regulate those radioactive materials. The only radioactive materials which can be regulated under this permit are Radium and accelerator produced Tritium.

Based on available data from the permit renewal application and discharge monitoring reports, none of the permitted outfalls has the potential to exceed State water quality standards for Radium 226+228 or accelerator produced Tritium. Tritium has been discharged at levels which exceed the new water quality standard at Outfall 051; however, available information shows that it is not accelerator produced and EPA does not have the authority to regulate it under this permit. As in the existing permit, the reissued permit is proposed to limit Radium and accelerator produced Tritium at all outfalls based on State water quality standards.

SECTION 304(l) - IMPAIRED WATER BODIES

Water Quality Segment Number 2-111 of the Rio Grande has never been included on the 304(l) list of impaired water bodies. Thus, no additional limits or conditions are required in the permit for Los Alamos National Laboratory.

c. MONITORING FREQUENCIES FOR LIMITED PARAMETERS

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity [40CFR122.48(b)] and to assure compliance with permit limitations [40CFR122.44(i)(1)].

The expired permit required monitoring for water quality standards based limits at a frequency of once per year at all outfalls. Effluent data show that at most outfalls the concentration of those pollutants is far below the levels required by State water quality standards. Therefore, the current level of monitoring is appropriate. Exceptions to this are Outfalls 02A129, 03A022, 03A048, 03A181, and 051.

Copper has been show to exceed the proposed water quality standard based limit at Outfalls 03A048 and 051. Monitoring for Copper at that outfall is proposed to be increased to once per quarter at Outfalls 03A048 and 051. At Outfall 03A022 Selenium has been reported at concentrations greater than the water quality standards. The monitoring frequency for Selenium at Outfall 03A022 is also proposed to be increased to once per quarter. Mercury has been shown to exceed water quality standards at Outfalls 051, 02A129, and 03A181 and is proposed to have an increased monitoring frequency of once per quarter at those outfalls.

5. AQUATIC TOXICITY TESTING

Since no designated aquatic life uses exist in the receiving streams, aquatic toxicity testing is not applied.

6. WATER QUALITY SCREENING FOR EPA HUMAN HEALTH PROTECTION BIOACCUMULATION CRITERIA

The receiving streams are not designated as a fishery or for domestic water supply; therefore, no comparison of effluent data with human health criteria for bioaccumulation is presented in this fact sheet.

7. OTHER WATER QUALITY BASED LIMITATIONS

a. DISCHARGE RATE LIMIT (OUTFALL 051)

The Radioactive Waste Treatment Facility (TA-50) discharges treated waste water to two 20,000 gallons holding tanks. Those tanks are presently emptied using two pumps with a combined capacity of 712 gallons per minute and are discharged to Mortandad Canyon (Outfall 051). The facility usually discharges one tank per day, which takes approximately thirty minutes. In order to minimize the possibility of erosion of potential release sites near the outfall and to reduce the possible movement of pollutants downstream, a maximum discharge rate limit of 88 gallons per minute is proposed to be added to that discharge. At that rate, the discharge will occur over a period of approximately four hours. This proposed limit is a Best Management Practice deemed to allow plant operators sufficient flexibility to resolve technical complications as it will not be necessary to discharge at times when the facility is not operating. The limit will also afford operators the ability to discharge at least two holding tanks of effluent during normal operating hours.

b. OTHER MONITORING REQUIREMENTS (OUTFALL 051)

The previous permit required monitoring for Total Nitrogen, Nitrate-Nitrite (as N), and Ammonia Nitrogen (as N) at Outfall 051. That monitoring was intended to collect information on the potential for the discharge to effect ground water. The State of New Mexico is regulating discharges to ground water under the Ground Water Discharge plan for Los Alamos National

Laboratory. Since data have been previously collected under this permit and New Mexico will regulate discharges to ground water under State regulation, monitoring in the reissued permit is not necessary. The monitoring requirements for Total Nitrogen, Nitrate-Nitrite (as N), and Ammonia Nitrogen (as N) are not proposed to be included in the reissued permit.

IX. VARIANCE REQUESTS

No variance requests have been received.

XI. ADMINISTRATIVE RECORD

The following section is a list of the fact sheet citations to applicable statutory or regulatory provisions and appropriate supporting references to the administrative record required by 40CFR124.9:

A. PERMIT(S)
NPDES Permit No. NM0028355 issued June 24, 1994 with an effective date of August 1, 1994 and an expiration date of October 31, 1998.

B. APPLICATION(S)
EPA Application Forms 1 and 2C dated April 30, 1998.

C. CLEAN WATER ACT CITATIONS
Section 101
Section 101(a)(3)
Section 303
Section 304(e)
Section 308
Section 401(a)(1)
Section 401(a)(2)

D. 40CFR CITATIONS

STANDARD CITATIONS
122.44
122.44(a)
122.44(d)
122.44(d)(1)
122.44(i)(1)
122.44(i)(2)
122.44(l)(2)(ii)

122.45(c)(3)
122.46(a)
122.48
122.48(b)
124.5
124.15(b)(1){PERMIT EFFECTIVE DATE > 30 DAYS}
124.53
131 amended at 57FR60848, 12/22/92

E. STATE WATER QUALITY REFERENCES

STATE ADMINSTRATIVE CODE
The general and specific stream standards are provided in "Water Quality Standards for Interstate and Intrastate Streams in New Mexico," (20NMAC6.1, effective 1/23/95)

WATER QUALITY STANDARDS IMPLEMENTATION
Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Stream, 5/5/95.

F. MISCELLANEOUS REFERENCES
Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants [49FR9016-9019, 3/9/84]

EPA Region 6 "Policy for Post Third Round NPDES Permitting" and "Post Third Round NPDES Permit Implementation Strategy," 10/1/92

National Toxics Rule, 57FR60848, 12/22/92

G. LETTERS/MEMORANDA/RECORDS OF COMMUNICATION, ETC.
State Certification Letter, from Jim Piatt, NMED to Myron O. Knudson, EPA Region 6, April 18, 1994

Habitat Management Plan Threatened and Endangered Species Concurrence Letter, from Jennifer Fowler-Propst, USFWS, to David A. Gurule, USDOE, February 12, 1999.

APPENDICES DIRECTORY

APPENDIX A
EFFLUENT ANALYSES

APPENDIX B1
WATER QUALITY STANDARDS, CALCULATION OF NUMERICAL STANDARDS-BASED EFFLUENT LIMITATIONS

APPENDIX B2
WATER QUALITY STANDARDS, MINIMUM QUANTIFICATION LEVELS (MQLs)

APPENDIX C
POLICY FOR POST THIRD ROUND NPDES PERMITTING

APPENDIX D
POST THIRD ROUND NPDES PERMIT IMPLEMENTATION STRATEGY

APPENDIX A

Available effluent data from the application form 2-C and discharges monitoring report forms for each outfall proposed to be included in the reissued permit follows.

OUTFALL No.: **01A001-Power Plant (Technical Area 3-22)**
DISCHARGED TO: **Sandia Canyon**
FREQUENCY: **Continuous**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	17.6
TSS	A.1.d	mg/L	NA	< 1
Oil & Grease	B.1.h	mg/L	NA	20.4
Fecal Coliform	B.1.d	#/100 ml	NA	< 2
Flow	A.1.f	MGD	0.03525	0.1008
COD	A.1.b	mg/L	NA	26.2
TOC	A.1.c	mg/L	NA	4.6
Ammonia (as N)	A.1.e	mg/L	NA	0.4
Bromide	B.1.a	ug/L	NA	0.6
Chlorine (Total Residual)	B.1.b	ug/L	NA	0.1
Color	B.1.c	nM	NA	20
Fluoride	B.1.e	ug/L	NA	< 0.5
Nitrate-Nitrite (N)	B.1.f	ug/L	NA	4.82
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA	0.8
Phosphorus, Total (as P)	B.1.i	ug/L	NA	1.56
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA	< 0.88
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	25.8	35
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	3.63	6.5
Radioactivity: Radium 226, Total	B.1.j.(4)	pCi/L	NA	NA
Tritium		pCi/L	89	266
Vanadium		ug/L	10	10
Sulfate (as SO4)	B.1.k	ug/L	NA	118
Sulfide (as S)	B.1.i	ug/L	NA	< 1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	700
Surfactants	B.1.n	ug/L	NA	70
Aluminum (T)	B.1.o	ug/L	NA	< 500
Barium (T)	B.1.p	ug/L	NA	20
Boron (T)	B.1.q	ug/L	NA	< 100
Cobalt (T)	B.1.r	ug/L	NA	< 0.01
Iron (T)	B.1.s	ug/L	NA	< 200
Magnesium (T)	B.1.t	ug/L	NA	3000
Molybdenum (T)	B.1.u	ug/L	NA	< 500
Manganese (T)	B.1.v	ug/L	NA	< 10
Tin (T)	B.1.w	ug/L	NA	< 2000
Titanium (T)	B.1.x	ug/L	NA	< 30
Phenolics (Total Recoverable)	15M	ug/L	NA	< 50
Antimony (T)	1M	ug/L	NA	< 50
Arsenic (T)	2M	ug/L	NA	< 60
Beryllium (T)	3M	ug/L	NA	< 4
Cadmium (T)	4M	ug/L	NA	< 8
Chromium (T)	5M	ug/L	NA	< 40
Copper (T)	6M	ug/L	NA	< 40
Lead (T)	7M	ug/L	NA	< 60
Mercury (T)	8M	ug/L	NA	< 0.2
Nickel (T)	9M	ug/L	NA	< 40
Selenium (T)	10M	ug/L	NA	< 3
Silver (T)	11M	ug/L	NA	< 20

Thallium (T)	12M	ug/L	NA	< 300
Zinc (T)	13M	ug/L	NA	< 700
Cyanide (T)	14M	ug/L	NA	< 20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	<*********
Acrolein	1V	ug/L	NA	< 62
Acrylonitrile	2V	ug/L	NA	< 62
Benzene	3V	ug/L	NA	< 12
Bromoform	5V	ug/L	NA	< 12
Carbon Tetrachloride	6V	ug/L	NA	< 12
Chlorobenzene	7V	ug/L	NA	< 62
Chlorodibromomethane	8V	ug/L	NA	< 12
Chloroethane	9V	ug/L	NA	< 12
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	< 62
Chloroform	11V	ug/L	NA	< 12
Dichlorobromomethane	12V	ug/L	NA	< 12
1,1-Dichloroethane	14V	ug/L	NA	< 12
1,2-Dichloroethane	15V	ug/L	NA	< 12
1,1-Dichloroethylene	16V	ug/L	NA	< 12
1,2-Dichloropropane	17V	ug/L	NA	< 12
1,3-Dichloropropylene	18V	ug/L	NA	< 12
Ethylbenzene	19V	ug/L	NA	< 12
Methyl Bromide	20V	ug/L	NA	< 62
Methyl Chloride	21V	ug/L	NA	< 62
Methylene Chloride	22V	ug/L	NA	< 25
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	< 12
Tetrachloroethylene	24V	ug/L	NA	< 12
Toluene	25V	ug/L	NA	< 12
1,2-trans-Dichloroethylene	26V	ug/L	NA	< 12
1,1,1-Trichloroethane	27V	ug/L	NA	< 12
1,1,2-Trichloroethane	28V	ug/L	NA	< 12
Trichloroethylene	29V	ug/L	NA	< 12
Vinyl Chloride	31V	ug/L	NA	< 12
2-Chlorophenol	1A	ug/L	NA	< 10
2,4-Dichlorophenol	2A	ug/L	NA	< 10
2,4-Dimethylphenol	3A	ug/L	NA	< 10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	< 50
2,4-Dinitrophenol	5A	ug/L	NA	< 50
2-Nitrophenol	6A	ug/L	NA	< 20
4-Nitrophenol	7A	ug/L	NA	< 50
p-Chloro-m-Cresol	8A	ug/L	NA	< 10
Pentachlorophenol	9A	ug/L	NA	< 50
Phenol	10A	ug/L	NA	< 10
2,4,6-Trichlorophenol	11A	ug/L	NA	< 10
Acenaphthene	1B	ug/L	NA	< 10
Acenaphthylene	2B	ug/L	NA	< 10
Anthracene	3B	ug/L	NA	< 10
Benzidine	4B	ug/L	NA	< 50
Benzo(a)anthracene	5B	ug/L	NA	< 10
Benzo(a)pyrene	6B	ug/L	NA	< 10
3,4-Benzofluoranthene	7B	ug/L	NA	< 10
Benzo(ghi)perylene	8B	ug/L	NA	< 20
Benzo(k)fluoranthene	9B	ug/L	NA	< 10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	< 10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	< 10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	< 10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	< 10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	< 10
Butyl Benzyl Phthalate	15B	ug/L	NA	< 10
2-Chloronapthalene	16B	ug/L	NA	< 10

4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	< 10
Chrysene	18B	ug/L	NA	< 10
Dibenzo(a,h)anthracene	19B	ug/L	NA	< 20
1,2-Dichlorobenzene	20B	ug/L	NA	< 10
1,3-Dichlorobenzene	21B	ug/L	NA	< 10
1,4-Dichlorobenzene	22B	ug/L	NA	< 10
3,3'-Dichlorobenzidine	23B	ug/L	NA	< 50
Diethyl Phthalate	24B	ug/L	NA	< 10
Dimethyl Phthalate	25B	ug/L	NA	< 10
Di-n-Butyl Phthalate	26B	ug/L	NA	< 10
2,4-Dinitrotoluene	27B	ug/L	NA	< 10
2,6-Dinitrotoluene	28B	ug/L	NA	< 10
Di-n-octyl Phthalate	29B	ug/L	NA	< 10
1,2-Diphenylhydrazine	30B	ug/L	NA	< 20
Fluoranthene	31B	ug/L	NA	< 10
Fluorene	32B	ug/L	NA	< 10
Hexachlorobenzene	33B	ug/L	NA	< 10
Hexachlorobutadiene	34B	ug/L	NA	< 10
Hexachlorocyclopentadiene	35B	ug/L	NA	< 10
Hexachloroethane	36B	ug/L	NA	< 20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	< 20
Isophorone	38B	ug/L	NA	< 10
Naphthalene	39B	ug/L	NA	< 10
Nitrobenzene	40B	ug/L	NA	< 10
n-Nitrosodimethylamine	41B	ug/L	NA	< 50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	< 20
n-Nitrosodiphenylamine	43B	ug/L	NA	< 20
Phenanthrene	44B	ug/L	NA	< 10
Pyrene	45B	ug/L	NA	< 10
1,2,4-Trichlorobenzene	46B	ug/L	NA	< 10
Aldrin	1P	ug/L	NA	< 0.05
Alpha-BHC	2P	ug/L	NA	< 0.05
Beta-BHC	3P	ug/L	NA	< 0.05
Gamma-BHC [Lindane]	4P	ug/L	NA	< 0.05
Delta-BHC	5P	ug/L	NA	< 0.05
Chlordane	6P	ug/L	NA	< 0.1
4,4'-DDT	7P	ug/L	NA	< 0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	< 0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	< 0.1
Dieldrin	10P	ug/L	NA	< 0.1
Alpha-Endosulfan	11P	ug/L	NA	< 0.1
Beta-Endosulfan	12P	ug/L	NA	< 0.1
Endosulfan Sulfate	13P	ug/L	NA	< 0.1
Endrin	14P	ug/L	NA	< 0.1
Endrin Aldehyde	15P	ug/L	NA	< 0.1
Heptachlor	16P	ug/L	NA	< 0.05
Heptachlor Epoxide	17P	ug/L	NA	< 0.05
PCB-1242	18P	ug/L	NA	< 1
PCB-1254	19P	ug/L	NA	< 1
PCB-1221	20P	ug/L	NA	< 1
PCB-1232	21P	ug/L	NA	< 1
PCB-1248	22P	ug/L	NA	< 1
PCB-1260	23P	ug/L	NA	< 1
PCB-1016	24P	ug/L	NA	< 1
Toxaphene	25P	ug/L	NA	< 5

OUTFALL NO: 13S - Sanitary Waste Water (Technical Area 46-347)

DISCHARGED TO: Canada del Buey
FREQUENCY: Continuous

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	3.22	73
TSS	A.1.d	mg/L	3.37	10.5
Oil & Grease	B.1.h	mg/L	NA	<5
Fecal Coliform	B.1.d	#/100 ml	2.1	11
Flow	A.1.f	MGD	0.2883	0.85
COD	A.1.b	mg/L	NA	15.4
TOC	A.1.c	mg/L	NA	3.5
Ammonia (as N)	A.1.e	mg/L	NA	0.7
Bromide	B.1.a	ug/L	NA	<500
Chlorine (Total Residual)	B.1.b	ug/L	NA	1660
Color	B.1.c	nM	NA	10
Fluoride	B.1.e	ug/L	NA	<500
Nitrate-Nitrite (N)	B.1.f	ug/L	NA	2000
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA	700
Phosphorus, Total (as P)	B.1.i	ug/L	NA	3740
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	1.3	2
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	13.1	23
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	2.3	3.5
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA	0
Tritium		pCi/L	84	254
Vanadium		ug/L	13	20
Sulfate (as SO4)	B.1.k	ug/L	NA	10700
Sulfide (as S)	B.1.i	ug/L	NA	<1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	<3000
Surfactants	B.1.n	ug/L	NA	<30
Aluminum (T)	B.1.o	ug/L	NA	<500
Barium (T)	B.1.p	ug/L	NA	10
Boron (T)	B.1.q	ug/L	100	400
Cobalt (T)	B.1.r	ug/L	NA	<10
Iron (T)	B.1.s	ug/L	NA	<200
Magnesium (T)	B.1.t	ug/L	NA	6100
Molybdenum (T)	B.1.u	ug/L	NA	<500
Manganese (T)	B.1.v	ug/L	NA	20
Tin (T)	B.1.w	ug/L	NA	<2000
Titanium (T)	B.1.x	ug/L	NA	<30
Phenolics (Total Recoverable)	15M	ug/L	NA	<50
Antimony (T)	1M	ug/L	NA	<50
Arsenic (T)	2M	ug/L	NA	<60
Beryllium (T)	3M	ug/L	NA	<4
Cadmium (T)	4M	ug/L	NA	<8
Chromium (T)	5M	ug/L	NA	<40
Copper (T)	6M	ug/L	NA	<40
Lead (T)	7M	ug/L	NA	<60
Mercury (T)	8M	ug/L	NA	<0.2
Nickel (T)	9M	ug/L	NA	<40
Selenium (T)	10M	ug/L	NA	<50
Silver (T)	11M	ug/L	NA	<20
Thallium (T)	12M	ug/L	NA	<300
Zinc (T)	13M	ug/L	NA	200
Cyanide (T)	14M	ug/L	NA	<20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	*********
Acrolein	1V	ug/L	NA	<50
Acrylonitrile	2V	ug/L	NA	<50
Benzene	3V	ug/L	NA	<10

Bromoform	5V	ug/L	NA	<10
Carbon Tetrachloride	6V	ug/L	NA	<10
Chlorobenzene	7V	ug/L	NA	<50
Chlorodibromomethane	8V	ug/L	NA	<10
Chloroethane	9V	ug/L	NA	<10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<50
Chloroform	11V	ug/L	NA	<10
Dichlorobromomethane	12V	ug/L	NA	<10
1,1-Dichloroethane	14V	ug/L	NA	<10
1,2-Dichloroethane	15V	ug/L	NA	<10
1,1-Dichloroethylene	16V	ug/L	NA	<10
1,2-Dichloropropane	17V	ug/L	NA	<10
1,3-Dichloropropylene	18V	ug/L	NA	<10
Ethylbenzene	19V	ug/L	NA	<10
Methyl Bromide	20V	ug/L	NA	<50
Methyl Chloride	21V	ug/L	NA	<50
Methylene Chloride	22V	ug/L	NA	<20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<10
Tetrachloroethylene	24V	ug/L	NA	<10
Toluene	25V	ug/L	NA	<10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<10
1,1,1-Trichloroethane	27V	ug/L	NA	<10
1,1,2-Trichloroethane	28V	ug/L	NA	<10
Trichloroethylene	29V	ug/L	NA	<10
Vinyl Chloride	31V	ug/L	NA	<10
2-Chlorophenol	1A	ug/L	NA	<10
2,4-Dichlorophenol	2A	ug/L	NA	<10
2,4-Dimethylphenol	3A	ug/L	NA	<10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<50
2,4-Dinitrophenol	5A	ug/L	NA	<50
2-Nitrophenol	6A	ug/L	NA	<20
4-Nitrophenol	7A	ug/L	NA	<50
p-Chloro-m-Cresol	8A	ug/L	NA	<10
Pentachlorophenol	9A	ug/L	NA	<50
Phenol	10A	ug/L	NA	<10
2,4,6-Trichlorophenol	11A	ug/L	NA	<10
Acenaphthene	1B	ug/L	NA	<10
Acenaphthylene	2B	ug/L	NA	<10
Anthracene	3B	ug/L	NA	<10
Benzidine	4B	ug/L	NA	<50
Benzo(a)anthracene	5B	ug/L	NA	<10
Benzo(a)pyrene	6B	ug/L	NA	<10
3,4-Benzofluoranthene	7B	ug/L	NA	<10
Benzo(ghi)perylene	8B	ug/L	NA	<20
Benzo(k)fluoranthene	9B	ug/L	NA	<10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<10
Butyl Benzyl Phthalate	15B	ug/L	NA	<10
2-Chloronapthalene	16B	ug/L	NA	<10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<10
Chrysene	18B	ug/L	NA	<10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<20
1,2-Dichlorobenzene	20B	ug/L	NA	<10
1,3-Dichlorobenzene	21B	ug/L	NA	<10
1,4-Dichlorobenzene	22B	ug/L	NA	<10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<50

Diethyl Phthalate	24B	ug/L	NA	<10
Dimethyl Phthalate	25B	ug/L	NA	<10
Di-n-Butyl Phthalate	26B	ug/L	NA	<10
2,4-Dinitrotoluene	27B	ug/L	NA	<10
2,6-Dinitrotoluene	28B	ug/L	NA	<10
Di-n-octyl Phthalate	29B	ug/L	NA	<10
1,2-Diphenylhydrazine	30B	ug/L	NA	<20
Fluoranthene	31B	ug/L	NA	<10
Fluorene	32B	ug/L	NA	<10
Hexachlorobenzene	33B	ug/L	NA	<10
Hexachlorobutadiene	34B	ug/L	NA	<10
Hexachlorocyclopentadiene	35B	ug/L	NA	<10
Hexachloroethane	36B	ug/L	NA	<20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<20
Isophorone	38B	ug/L	NA	<10
Naphthalene	39B	ug/L	NA	<10
Nitrobenzene	40B	ug/L	NA	<10
n-Nitrosodimethylamine	41B	ug/L	NA	<50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<20
n-Nitrosodiphenylamine	43B	ug/L	NA	<20
Phenanthrene	44B	ug/L	NA	<10
Pyrene	45B	ug/L	NA	<10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<10
Aldrin	1P	ug/L	NA	<0.05
Alpha-BHC	2P	ug/L	NA	<0.05
Beta-BHC	3P	ug/L	NA	<0.05
Gamma-BHC [Lindane]	4P	ug/L	NA	<0.05
Delta-BHC	5P	ug/L	NA	<0.05
Chlordane	6P	ug/L	NA	<0.1
4,4'-DDT	7P	ug/L	NA	<0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<0.1
Dieldrin	10P	ug/L	NA	<0.1
Alpha-Endosulfan	11P	ug/L	NA	<0.1
Beta-Endosulfan	12P	ug/L	NA	<0.1
Endosulfan Sulfate	13P	ug/L	NA	<0.1
Endrin	14P	ug/L	NA	<0.1
Endrin Aldehyde	15P	ug/L	NA	<0.1
Heptachlor	16P	ug/L	NA	<0.05
Heptachlor Epoxide	17P	ug/L	NA	<0.05
PCB-1242	18P	ug/L	NA	<1
PCB-1254	19P	ug/L	NA	<1
PCB-1221	20P	ug/L	NA	<1
PCB-1232	21P	ug/L	NA	<1
PCB-1248	22P	ug/L	NA	<1
PCB-1260	23P	ug/L	NA	<1
PCB-1016	24P	ug/L	NA	<1
Toxaphene	25P	ug/L	NA	<5.3

OUTFALL No.: **051 - Radioactive/Industrial Waste Water (Technical Area 50-1)**
DISCHARGED TO: **Mortandad Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	< 2
TSS	A.1.d	mg/L	8.2	85
Oil & Grease	B.1.h	mg/L	NA	< 1

Flow	A.1.f	MGD	0.0247	0.0439
COD	A.1.b	mg/L	36.22	145
TOC	A.1.c	mg/L	NA	11
Ammonia (as N)	A.1.e	mg/L	5.38	20.7
Bromide	B.1.a	ug/L	NA	<1000
Chlorine (Total Residual)	B.1.b	ug/L	NA	10
Color	B.1.c	nM	NA	5
Fluoride	B.1.e	ug/L	NA	770
Nitrate-Nitrite (N)	B.1.f	ug/L	55950	241100
Organic Nitrogen, Total (as N)	B.1.G	ug/L	29370	175000
Phosphorus, Total (as P)	B.1.i	ug/L	NA	340
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA	47
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	NA	165
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	4.8	16
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA	0.07
Tritium		pCi/L	103534	147059
Vanadium		ug/L	3	10
Total Toxic Organics		ug/L	8	300
Sulfate (as SO4)	B.1.k	ug/L	NA	20900
Sulfite: (as SO3)	B.1.m	ug/L	NA	<3000
Surfactants	B.1.n	ug/L	NA	<100
Aluminum (T)	B.1.o	ug/L	NA	< 50
Barium (T)	B.1.p	ug/L	NA	20
Boron (T)	B.1.q	ug/L	NA	200
Cobalt (T)	B.1.r	ug/L	NA	< 3
Iron (T)	B.1.s	ug/L	70	3442
Magnesium (T)	B.1.t	ug/L	NA	430
Molybdenum (T)	B.1.u	ug/L	NA	22
Manganese (T)	B.1.v	ug/L	NA	7
Tin (T)	B.1.w	ug/L	NA	<20
Titanium (T)	B.1.x	ug/L	NA	< 2
Phenolics (Total Recoverable)	15M	ug/L	NA	<50
Antimony (T)	1M	ug/L	NA	<40
Arsenic (T)	2M	ug/L	NA	0
Beryllium (T)	3M	ug/L	NA	<3
Cadmium (T)	4M	ug/L	0	100
Chromium (T)	5M	ug/L	0.2	20
Copper (T)	6M	ug/L	116.3	900
Lead (T)	7M	ug/L	7	100
Mercury (T)	8M	ug/L	< 0.032	10
Nickel (T)	9M	ug/L	143	5600
Selenium (T)	10M	ug/L	NA	<3
Silver (T)	11M	ug/L	NA	<4
Thallium (T)	12M	ug/L	NA	<70
Zinc (T)	13M	ug/L	57	200
Cyanide (T)	14M	ug/L	NA	0
2,3,7,8-TCDD	DIOXIN	ug/L	NA	*********
Acrolein	1V	ug/L	NA	<100
Acrylonitrile	2V	ug/L	NA	<100
Benzene	3V	ug/L	NA	< 5
Bromoform	5V	ug/L	NA	< 5
Carbon Tetrachloride	6V	ug/L	NA	< 5
Chlorobenzene	7V	ug/L	NA	< 5
Chlorodibromomethane	8V	ug/L	NA	< 5
Chloroethane	9V	ug/L	NA	<10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<50
Chloroform	11V	ug/L	NA	< 5
Dichlorobromomethane	12V	ug/L	NA	< 5
1,1-Dichloroethane	14V	ug/L	NA	< 5

1,2-Dichloroethane	15V	ug/L	NA	< 5
1,1-Dichloroethylene	16V	ug/L	NA	< 5
1,2-Dichloropropane	17V	ug/L	NA	< 5
1,3-Dichloropropylene	18V	ug/L	NA	< 5
Ethylbenzene	19V	ug/L	NA	< 5
Methyl Bromide	20V	ug/L	NA	< 10
Methyl Chloride	21V	ug/L	NA	< 10
Methylene Chloride	22V	ug/L	NA	< 2
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	< 5
Tetrachloroethylene	24V	ug/L	NA	< 5
Toluene	25V	ug/L	NA	< 5
1,2-trans-Dichloroethylene	26V	ug/L	NA	< 2
1,1,1-Trichloroethane	27V	ug/L	NA	< 5
1,1,2-Trichloroethane	28V	ug/L	NA	< 5
Trichloroethylene	29V	ug/L	NA	< 5
Vinyl Chloride	31V	ug/L	NA	< 10
2-Chlorophenol	1A	ug/L	NA	< 10
2,4-Dichlorophenol	2A	ug/L	NA	< 10
2,4-Dimethylphenol	3A	ug/L	NA	< 10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	< 50
2,4-Dinitrophenol	5A	ug/L	NA	< 50
2-Nitrophenol	6A	ug/L	NA	< 10
4-Nitrophenol	7A	ug/L	NA	< 50
p-Chloro-m-Cresol	8A	ug/L	NA	< 10
Pentachlorophenol	9A	ug/L	NA	< 50
Phenol	10A	ug/L	NA	< 10
2,4,6-Trichlorophenol	11A	ug/L	NA	< 10
Acenaphthene	1B	ug/L	NA	< 10
Acenaphthylene	2B	ug/L	NA	< 10
Anthracene	3B	ug/L	NA	< 10
Benzidine	4B	ug/L	NA	< 50
Benzo(a)anthracene	5B	ug/L	NA	< 10
Benzo(a)pyrene	6B	ug/L	NA	< 10
3,4-Benzofluoranthene	7B	ug/L	NA	< 10
Benzo(ghi)perylene	8B	ug/L	NA	< 10
Benzo(k)fluoranthene	9B	ug/L	NA	< 10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	< 10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	< 10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	< 10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	< 4
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	< 10
Butyl Benzyl Phthalate	15B	ug/L	NA	< 10
2-Chloronapthalene	16B	ug/L	NA	< 10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	< 10
Chrysene	18B	ug/L	NA	< 10
Dibenzo(a,h)anthracene	19B	ug/L	NA	< 10
1,2-Dichlorobenzene	20B	ug/L	NA	< 10
1,3-Dichlorobenzene	21B	ug/L	NA	< 10
1,4-Dichlorobenzene	22B	ug/L	NA	< 10
3,3'-Dichlorobenzidine	23B	ug/L	NA	< 10
Diethyl Phthalate	24B	ug/L	NA	< 10
Dimethyl Phthalate	25B	ug/L	NA	< 10
Di-n-Butyl Phthalate	26B	ug/L	NA	< 10
2,4-Dinitrotoluene	27B	ug/L	NA	< 10
2,6-Dinitrotoluene	28B	ug/L	NA	< 10
Di-n-octyl Phthalate	29B	ug/L	NA	< 10
1,2-Diphenylhydrazine	30B	ug/L	NA	< 10
Fluoranthene	31B	ug/L	NA	< 10
Fluorene	32B	ug/L	NA	< 10

Hexachlorobenzene	33B	ug/L	NA	< 10
Hexachlorobutadiene	34B	ug/L	NA	< 10
Hexachlorocyclopentadiene	35B	ug/L	NA	< 10
Hexachloroethane	36B	ug/L	NA	< 10
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	< 10
Isophorone	38B	ug/L	NA	< 10
Naphthalene	39B	ug/L	NA	< 10
Nitrobenzene	40B	ug/L	NA	< 10
n-Nitrosodimethylamine	41B	ug/L	NA	< 10
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	< 10
n-Nitrosodiphenylamine	43B	ug/L	NA	< 10
Phenanthrene	44B	ug/L	NA	< 10
Pyrene	45B	ug/L	NA	< 10
1,2,4-Trichlorobenzene	46B	ug/L	NA	< 10
Aldrin	1P	ug/L	NA	< 0.05
Alpha-BHC	2P	ug/L	NA	< 0.05
Beta-BHC	3P	ug/L	NA	< 0.06
Gamma-BHC [Lindane]	4P	ug/L	NA	< 0.05
Delta-BHC	5P	ug/L	NA	< 0.05
Chlordane	6P	ug/L	NA	< 0.5
4,4'-DDT	7P	ug/L	NA	< 0.05
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	< 0.05
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	< 0.05
Dieldrin	10P	ug/L	NA	< 0.05
Alpha-Endosulfan	11P	ug/L	NA	< 0.05
Beta-Endosulfan	12P	ug/L	NA	< 0.05
Endosulfan Sulfate	13P	ug/L	NA	< 0.05
Endrin	14P	ug/L	NA	< 0.05
Endrin Aldehyde	15P	ug/L	NA	< 0.05
Heptachlor	16P	ug/L	NA	< 0.05
Heptachlor Epoxide	17P	ug/L	NA	< 0.05
PCB-1242	18P	ug/L	NA	< 1
PCB-1254	19P	ug/L	NA	< 1
PCB-1221	20P	ug/L	NA	< 1
PCB-1232	21P	ug/L	NA	< 1
PCB-1248	22P	ug/L	NA	< 1
PCB-1260	23P	ug/L	NA	< 1
PCB-1016	24P	ug/L	NA	< 1
Toxaphene	25P	ug/L	NA	< 2

OUTFALL No.: **05A055 - High Explosives Waste Water (Technical Area 16-1508)**
DISCHARGED TO: **Canon de Valle**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	< 2
TSS	A.1.d	mg/L	5.5	18
Oil & Grease	B.1.h	mg/L	1.7	5.6
Fecal Coliform	B.1.d	#/100 ml	NA	3
Flow	A.1.f	MGD	0.01	0.02
COD	A.1.b	mg/L	11.3	28
TOC	A.1.c	mg/L	NA	< 0.7
Ammonia (as N)	A.1.e	mg/L	NA	< 0.2
Bromide	B.1.a	ug/L	NA	< 500

Chlorine (Total Residual)	B.1.b	ug/L	NA		40
Color	B.1.c	nM	NA		10
Fluoride	B.1.e	ug/L	NA	<	500
Nitrate-Nitrite (N)	B.1.f	ug/L	NA		610
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA		100
Phosphorus, Total (as P)	B.1.i	ug/L	NA		90
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.9		0.9
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	6.2		7
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	2.73		6.9
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA		0.81
Tritium		pCi/L	NA		0
Vanadium		ug/L	NA		0
Sulfate (as SO4)	B.1.k	ug/L	NA		63300
Sulfide (as S)	B.1.i	ug/L	NA	<	1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	<	3000
Surfactants	B.1.n	ug/L	NA	<	30
Aluminum (T)	B.1.o	ug/L	100		100
Barium (T)	B.1.p	ug/L	NA		60
Boron (T)	B.1.q	ug/L	130		200
Cobalt (T)	B.1.r	ug/L		<	10
Iron (T)	B.1.s	ug/L	NA		300
Magnesium (T)	B.1.t	ug/L	NA		3200
Molybdenum (T)	B.1.u	ug/L	NA	<	500
Manganese (T)	B.1.v	ug/L	NA		43
Tin (T)	B.1.w	ug/L	NA	<	2000
Titanium (T)	B.1.x	ug/L	NA	<	30
Phenolics (Total Recoverable)	15M	ug/L	NA	<	50
Antimony (T)	1M	ug/L	NA	<	50
Arsenic (T)	2M	ug/L	NA	<	60
Beryllium (T)	3M	ug/L	NA	<	4
Cadmium (T)	4M	ug/L	NA	<	8
Chromium (T)	5M	ug/L	NA	<	40
Copper (T)	6M	ug/L	NA	<	40
Lead (T)	7M	ug/L	NA	<	100
Mercury (T)	8M	ug/L	NA	<	0.2
Nickel (T)	9M	ug/L	NA	<	40
Selenium (T)	10M	ug/L	NA	<	3
Silver (T)	11M	ug/L	NA	<	10
Thallium (T)	12M	ug/L	NA	<	100
Zinc (T)	13M	ug/L	70		100
Cyanide (T)	14M	ug/L	NA	<	20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	<	*********
Acrolein	1V	ug/L	NA	<	50
Acrylonitrile	2V	ug/L	NA	<	50
Benzene	3V	ug/L	NA	<	10
Bromoform	5V	ug/L	NA	<	10
Carbon Tetrachloride	6V	ug/L	NA	<	10
Chlorobenzene	7V	ug/L	NA	<	50
Chlorodibromomethane	8V	ug/L	NA	<	10
Chloroethane	9V	ug/L	NA	<	10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<	50
Chloroform	11V	ug/L	NA	<	10
Dichlorobromomethane	12V	ug/L	NA	<	10
1,1-Dichloroethane	14V	ug/L	NA	<	10
1,2-Dichloroethane	15V	ug/L	NA	<	10
1,1-Dichloroethylene	16V	ug/L	NA	<	10
1,2-Dichloropropane	17V	ug/L	NA	<	10
1,3-Dichloropropylene	18V	ug/L	NA	<	20
Ethylbenzene	19V	ug/L	NA	<	10

Methyl Bromide	20V	ug/L	NA	<	50
Methyl Chloride	21V	ug/L	NA	<	50
Methylene Chloride	22V	ug/L	NA	<	20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	10
Tetrachloroethylene	24V	ug/L	NA	<	10
Toluene	25V	ug/L	NA	<	10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	10
1,1,1-Trichloroethane	27V	ug/L	NA	<	10
1,1,2-Trichloroethane	28V	ug/L	NA	<	10
Trichloroethylene	29V	ug/L	NA	<	10
Vinyl Chloride	31V	ug/L	NA	<	10
2-Chlorophenol	1A	ug/L	NA	<	10
2,4-Dichlorophenol	2A	ug/L	NA	<	10
2,4-Dimethylphenol	3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	50
2,4-Dinitrophenol	5A	ug/L	NA	<	50
2-Nitrophenol	6A	ug/L	NA	<	20
4-Nitrophenol	7A	ug/L	NA	<	50
p-Chloro-m-Cresol	8A	ug/L	NA	<	10
Pentachlorophenol	9A	ug/L	NA	<	50
Phenol	10A	ug/L	NA	<	10
2,4,6-Trichlorophenol	11A	ug/L	NA	<	10
Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10
2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10
Fluorene	32B	ug/L	NA	<	10
Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20

Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.05
Alpha-BHC	2P	ug/L	NA	<	0.05
Beta-BHC	3P	ug/L	NA	<	0.05
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.05
Delta-BHC	5P	ug/L	NA	<	0.05
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.1
Dieldrin	10P	ug/L	NA	<	0.1
Alpha-Endosulfan	11P	ug/L	NA	<	0.1
Beta-Endosulfan	12P	ug/L	NA	<	0.1
Endosulfan Sulfate	13P	ug/L	NA	<	0.1
Endrin	14P	ug/L	NA	<	0.1
Endrin Aldehyde	15P	ug/L	NA	<	0.1
Heptachlor	16P	ug/L	NA	<	0.05
Heptachlor Epoxide	17P	ug/L	NA	<	0.05
PCB-1242	18P	ug/L	NA	<	1.1
PCB-1254	19P	ug/L	NA	<	1.1
PCB-1221	20P	ug/L	NA	<	1.1
PCB-1232	21P	ug/L	NA	<	1.1
PCB-1248	22P	ug/L	NA	<	1.1
PCB-1260	23P	ug/L	NA	<	1.1
PCB-1016	24P	ug/L	NA	<	1.1
Toxaphene	25P	ug/L	NA	<	5.4

OUTFALL No.: **05A097 - High Explosives Waste Water (Technical Area 11-52)**
DISCHARGED TO: **Water Canyon**
FREQUENCY: **Not Presently Discharging**

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA		5.7
TSS	A.1.d	mg/L		<	4
Oil & Grease	B.1.h	mg/L		<	5
Fecal Coliform	B.1.d	#/100 ml	NA		NA
Flow	A.1.f	MGD	NA		NA
COD	A.1.b	mg/L			21.6
TOC	A.1.c	mg/L	NA		6.29
Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA	<	500
Chlorine (Total Residual)	B.1.b	ug/L	NA		100
Color	B.1.c	nM	NA		35
Fluoride	B.1.e	ug/L	NA	<	500
Nitrate-Nitrite (N)	B.1.f	ug/L	NA		200
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA		1600
Phosphorus, Total (as P)	B.1.i	ug/L	NA		100
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.7		2.03
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	2		5.83

Radioactivity: Radium, Total	B.1.j.(3)	pCi/L		3.35
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA	1.89
Sulfate (as SO4)	B.1.k	ug/L	NA	3300
Sulfide (as S)	B.1.i	ug/L	NA	< 1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	< 3000
Surfactants	B.1.n	ug/L	NA	150
Aluminum (T)	B.1.o	ug/L	100	< 500
Barium (T)	B.1.p	ug/L	NA	70
Boron (T)	B.1.q	ug/L	130	< 300
Cobalt (T)	B.1.r	ug/L		< 10
Iron (T)	B.1.s	ug/L	NA	< 200
Magnesium (T)	B.1.t	ug/L	NA	200
Molybdenum (T)	B.1.u	ug/L	NA	< 500
Manganese (T)	B.1.v	ug/L	NA	< 10
Tin (T)	B.1.w	ug/L	NA	< 2000
Titanium (T)	B.1.x	ug/L	NA	< 30
Phenolics (Total Recoverable)	15M	ug/L	NA	< 50
Antimony (T)	1M	ug/L	NA	< 50
Arsenic (T)	2M	ug/L	NA	< 60
Beryllium (T)	3M	ug/L	NA	< 4
Cadmium (T)	4M	ug/L	NA	< 8
Chromium (T)	5M	ug/L	NA	< 40
Copper (T)	6M	ug/L	NA	< 40
Lead (T)	7M	ug/L	NA	< 60
Mercury (T)	8M	ug/L	NA	< 0.2
Nickel (T)	9M	ug/L	NA	< 40
Selenium (T)	10M	ug/L	NA	< 3
Silver (T)	11M	ug/L	NA	< 20
Thallium (T)	12M	ug/L	NA	< 300
Zinc (T)	13M	ug/L		< 100
Cyanide (T)	14M	ug/L	NA	< 20

OUTFALL No.: **02A129 - Steam Plant (Technical Area 21-357)**
DISCHARGED TO: **Los Alamos Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	10.5
TSS	A.1.d	mg/L	NA	7
Oil & Grease	B.1.h	mg/L	NA	< 5
Fecal Coliform	B.1.d	#/100 ml	NA	< 2
Flow	A.1.f	MGD	0.0178	0.0864
COD	A.1.b	mg/L	NA	64.1
TOC	A.1.c	mg/L	NA	30
Ammonia (as N)	A.1.e	mg/L	NA	< 0.2
Bromide	B.1.a	ug/L	NA	< 0.5
Chlorine (Total Residual)	B.1.b	ug/L	NA	0
Color	B.1.c	nM	NA	20
Fluoride	B.1.e	ug/L	NA	< 600
Nitrate-Nitrite (N)	B.1.f	ug/L	NA	630
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA	900
Phosphorus, Total (as P)	B.1.i	ug/L	NA	6810
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA	2
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	19.9	36
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	3.63	< 3.14
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA	< 1.68
Tritium		pCi/L	377	731

Vanadium		ug/L	27		40
Sulfate (as SO4)	B.1.k	ug/L	NA		28600
Sulfide (as S)	B.1.i	ug/L	NA		4200
Sulfite: (as SO3)	B.1.m	ug/L	NA		1500
Surfactants	B.1.n	ug/L	NA		70
Aluminum (T)	B.1.o	ug/L	NA	<	500
Barium (T)	B.1.p	ug/L	NA	<	10
Boron (T)	B.1.q	ug/L	NA	<	100
Cobalt (T)	B.1.r	ug/L	NA	<	10
Iron (T)	B.1.s	ug/L	NA		110
Magnesium (T)	B.1.t	ug/L	NA		1400
Molybdenum (T)	B.1.u	ug/L	NA	<	20
Manganese (T)	B.1.v	ug/L	NA		15
Tin (T)	B.1.w	ug/L	NA	<	2000
Titanium (T)	B.1.x	ug/L	NA	<	30
Phenolics (Total Recoverable)	15M	ug/L	NA	<	50
Antimony (T)	1M	ug/L	NA	<	50
Arsenic (T)	2M	ug/L	NA	<	60
Beryllium (T)	3M	ug/L	NA	<	4
Cadmium (T)	4M	ug/L	NA	<	8
Chromium (T)	5M	ug/L	NA	<	20
Copper (T)	6M	ug/L	NA	<	40
Lead (T)	7M	ug/L	NA	<	50
Mercury (T)	8M	ug/L	NA		0.3
Nickel (T)	9M	ug/L	NA	<	40
Selenium (T)	10M	ug/L	NA	<	3
Silver (T)	11M	ug/L	NA	<	2
Thallium (T)	12M	ug/L	NA	<	300
Zinc (T)	13M	ug/L	NA	<	700
Cyanide (T)	14M	ug/L	NA	<	20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	<	*********
Acrolein	1V	ug/L	NA	<	50
Acrylonitrile	2V	ug/L	NA	<	50
Benzene	3V	ug/L	NA	<	10
Bromoform	5V	ug/L	NA	<	10
Carbon Tetrachloride	6V	ug/L	NA	<	10
Chlorobenzene	7V	ug/L	NA	<	50
Chlorodibromomethane	8V	ug/L	NA	<	10
Chloroethane	9V	ug/L	NA	<	10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<	50
Chloroform	11V	ug/L	NA	<	10
Dichlorobromomethane	12V	ug/L	NA	<	10
1,1-Dichloroethane	14V	ug/L	NA	<	10
1,2-Dichloroethane	15V	ug/L	NA	<	10
1,1-Dichloroethylene	16V	ug/L	NA	<	10
1,2-Dichloropropane	17V	ug/L	NA	<	10
1,3-Dichloropropylene	18V	ug/L	NA	<	10
Ethylbenzene	19V	ug/L	NA	<	10
Methyl Bromide	20V	ug/L	NA	<	50
Methyl Chloride	21V	ug/L	NA	<	50
Methylene Chloride	22V	ug/L	NA	<	20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	10
Tetrachloroethylene	24V	ug/L	NA	<	10
Toluene	25V	ug/L	NA	<	10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	10
1,1,1-Trichloroethane	27V	ug/L	NA	<	10
1,1,2-Trichloroethane	28V	ug/L	NA	<	10
Trichloroethylene	29V	ug/L	NA	<	10
Vinyl Chloride	31V	ug/L	NA	<	10

2-Chlorophenol	1A	ug/L	NA	<	10
2,4-Dichlorophenol	2A	ug/L	NA	<	10
2,4-Dimethylphenol	3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	50
2,4-Dinitrophenol	5A	ug/L	NA	<	50
2-Nitrophenol	6A	ug/L	NA	<	20
4-Nitrophenol	7A	ug/L	NA	<	50
p-Chloro-m-Cresol	8A	ug/L	NA	<	10
Pentachlorophenol	9A	ug/L	NA	<	50
Phenol	10A	ug/L	NA	<	10
2,4,6-Trichlorophenol	11A	ug/L	NA	<	10
Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10
2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10
Fluorene	32B	ug/L	NA	<	10
Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20
Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.05
Alpha-BHC	2P	ug/L	NA	<	0.05

Beta-BHC	3P	ug/L	NA	<	0.05
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.05
Delta-BHC	5P	ug/L	NA	<	0.05
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.1
Dieldrin	10P	ug/L	NA	<	0.1
Alpha-Endosulfan	11P	ug/L	NA	<	0.1
Beta-Endosulfan	12P	ug/L	NA	<	0.1
Endosulfan Sulfate	13P	ug/L	NA	<	0.1
Endrin	14P	ug/L	NA	<	0.1
Endrin Aldehyde	15P	ug/L	NA	<	0.1
Heptachlor	16P	ug/L	NA	<	0.05
Heptachlor Epoxide	17P	ug/L	NA	<	0.05
PCB-1242	18P	ug/L	NA	<	1.1
PCB-1254	19P	ug/L	NA	<	1.1
PCB-1221	20P	ug/L	NA	<	1.1
PCB-1232	21P	ug/L	NA	<	1.1
PCB-1248	22P	ug/L	NA	<	1.1
PCB-1260	23P	ug/L	NA	<	1.1
PCB-1016	24P	ug/L	NA	<	1.1
Toxaphene	25P	ug/L	NA	<	5.4

OUTFALL No.: **03A021 - Cooling Water (Technical Area 3-29)**
DISCHARGED TO: **Mortandad Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA	<	2
TSS	A.1.d	mg/L	NA	<	4
Oil & Grease	B.1.h	mg/L	NA	<	1
Fecal Coliform	B.1.d	#/100 ml	NA	<	30
Flow	A.1.f	MGD	0.01351		0.0576
COD	A.1.b	mg/L	NA		2.5
TOC	A.1.c	mg/L	NA		2.3
Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA	<	0.5
Chlorine (Total Residual)	B.1.b	ug/L	NA	<	0.1
Color	B.1.c	nM	NA		10
Fluoride	B.1.e	ug/L	NA		600
Nitrate-Nitrite (N)	B.1.f	ug/L	NA		900
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA		0
Phosphorus, Total (as P)	B.1.i	ug/L	NA		120
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA		1
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	NA		12
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	3.63		0.4
Radioactivity: Radium 226, Total	B.1.j.(4)	pCi/L	NA	<	0.1
Sulfate (as SO4)	B.1.k	ug/L	NA		6200
Sulfide (as S)	B.1.i	ug/L	NA	<	1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	<	3000
Surfactants	B.1.n	ug/L	NA	<	30
Aluminum (T)	B.1.o	ug/L	NA	<	500
Barium (T)	B.1.p	ug/L	NA	<	60
Boron (T)	B.1.q	ug/L	NA	<	300
Cobalt (T)	B.1.r	ug/L	NA	<	10
Iron (T)	B.1.s	ug/L	NA	<	200
Magnesium (T)	B.1.t	ug/L	NA		9400

Molybdenum	(T)	B.1.u	ug/L	NA	<	500
Manganese	(T)	B.1.v	ug/L	NA	<	10
Tin	(T)	B.1.w	ug/L	NA		2000
Titanium	(T)	B.1.x	ug/L	NA	<	30
Phenolics	(Total Recoverable)	15M	ug/L	NA	<	50
Antimony	(T)	1M	ug/L	NA	<	50
Arsenic	(T)	2M	ug/L	NA	<	60
Beryllium	(T)	3M	ug/L	NA	<	4
Cadmium	(T)	4M	ug/L	NA	<	8
Chromium	(T)	5M	ug/L	NA	<	40
Copper	(T)	6M	ug/L	NA	<	40
Lead	(T)	7M	ug/L	NA	<	60
Mercury	(T)	8M	ug/L	NA	<	0.2
Nickel	(T)	9M	ug/L	NA	<	40
Selenium	(T)	10M	ug/L	NA	<	3
Silver	(T)	11M	ug/L	NA	<	20
Thallium	(T)	12M	ug/L	NA	<	300
Zinc	(T)	13M	ug/L	NA	<	100
Cyanide	(T)	14M	ug/L	NA	<	20
2,3,7,8-TCDD		DIOXIN	ug/L	NA	<	*********
Acrolein		1V	ug/L	NA	<	20
Acrylonitrile		2V	ug/L	NA	<	20
Benzene		3V	ug/L	NA	<	1
Bromoform		5V	ug/L	NA	<	1
Carbon Tetrachloride		6V	ug/L	NA	<	1
Chlorobenzene		7V	ug/L	NA	<	1
Chlorodibromomethane		8V	ug/L	NA	<	1
Chloroethane		9V	ug/L	NA	<	5
2-Chloroethyl Vinyl Ether		10V	ug/L	NA	<	5
Chloroform		11V	ug/L	NA	<	1
Dichlorobromomethane		12V	ug/L	NA	<	1
1,1-Dichloroethane		14V	ug/L	NA	<	1
1,2-Dichloroethane		15V	ug/L	NA	<	1
1,1-Dichloroethylene		16V	ug/L	NA	<	1
1,2-Dichloropropane		17V	ug/L	NA	<	1
1,3-Dichloropropylene		18V	ug/L	NA	<	1
Ethylbenzene		19V	ug/L	NA	<	1
Methyl Bromide		20V	ug/L	NA	<	5
Methyl Chloride		21V	ug/L	NA	<	5
Methylene Chloride		22V	ug/L	NA	<	10
1,1,2,2-Tetrachloroethane		23V	ug/L	NA	<	1
Tetrachloroethylene		24V	ug/L	NA	<	1
Toluene		25V	ug/L	NA	<	1
1,2-trans-Dichloroethylene		26V	ug/L	NA	<	1
1,1,1-Trichloroethane		27V	ug/L	NA	<	1
1,1,2-Trichloroethane		28V	ug/L	NA	<	1
Trichloroethylene		29V	ug/L	NA	<	1
Vinyl Chloride		31V	ug/L	NA	<	5
2-Chlorophenol		1A	ug/L	NA	<	10
2,4-Dichlorophenol		2A	ug/L	NA	<	10
2,4-Dimethylphenol		3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol		4A	ug/L	NA	<	50
2,4-Dinitrophenol		5A	ug/L	NA	<	50
2-Nitrophenol		6A	ug/L	NA	<	20
4-Nitrophenol		7A	ug/L	NA	<	50
p-Chloro-m-Cresol		8A	ug/L	NA	<	10
Pentachlorophenol		9A	ug/L	NA	<	50
Phenol		10A	ug/L	NA	<	10
2,4,6-Trichlorophenol		11A	ug/L	NA	<	10

Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10
2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10
Fluorene	32B	ug/L	NA	<	10
Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20
Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.02
Alpha-BHC	2P	ug/L	NA	<	0.02
Beta-BHC	3P	ug/L	NA	<	0.02
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.02
Delta-BHC	5P	ug/L	NA	<	0.02
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.03
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.02
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.03
Dieldrin	10P	ug/L	NA	<	0.02
Alpha-Endosulfan	11P	ug/L	NA	<	0.03
Beta-Endosulfan	12P	ug/L	NA	<	0.03
Endosulfan Sulfate	13P	ug/L	NA	<	0.03

Endrin	14P	ug/L	NA	<	0.05
Endrin Aldehyde	15P	ug/L	NA	<	0.05
Heptachlor	16P	ug/L	NA	<	0.03
Heptachlor Epoxide	17P	ug/L	NA	<	0.03
PCB-1242	18P	ug/L	NA	<	0.1
PCB-1254	19P	ug/L	NA	<	0.1
PCB-1221	20P	ug/L	NA	<	0.1
PCB-1232	21P	ug/L	NA	<	0.1
PCB-1248	22P	ug/L	NA	<	0.1
PCB-1260	23P	ug/L	NA	<	0.1
PCB-1016	24P	ug/L	NA	<	0.1
Toxaphene	25P	ug/L	NA	<	0.1

OUTFALL No.: **03A022 - Cooling Water (Technical Area 3-2274)**
DISCHARGED TO: **Mortandad Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA	<	2
TSS	A.1.d	mg/L	NA	<	4
Flow	A.1.f	MGD	0.01379		0.0288
COD	A.1.b	mg/L	NA		12.8
TOC	A.1.c	mg/L	NA		1.5
Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA	<	500
Phosphorus, Total (as P)	B.1.i	ug/L	NA		70
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA		0.2
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	2.2		2.5
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	0.87		1.7
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA		0.1
Tritium		pCi/L	191		418
Vanadium		ug/L	23		40
Boron (T)	B.1.q	ug/L	30		100
Cobalt (T)	B.1.r	ug/L	0		0
Molybdenum (T)	B.1.u	ug/L	NA	<	20
Arsenic (T)	2M	ug/L	0		0
Cadmium (T)	4M	ug/L	0		0
Chromium (T)	5M	ug/L	0		0
Copper (T)	6M	ug/L	30		100
Lead (T)	7M	ug/L	0		0
Mercury (T)	8M	ug/L	0		0
Selenium (T)	10M	ug/L	3		10
Zinc (T)	13M	ug/L	70		100
Acrolein	1V	ug/L	NA	<	20
Acrylonitrile	2V	ug/L	NA	<	20
Benzene	3V	ug/L	NA	<	1
Bromoform	5V	ug/L	NA	<	1
Carbon Tetrachloride	6V	ug/L	NA	<	1
Chlorobenzene	7V	ug/L	NA	<	1
Chlorodibromomethane	8V	ug/L	NA	<	1
Chloroethane	9V	ug/L	NA	<	5
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<	5
Chloroform	11V	ug/L	NA	<	1
Dichlorobromomethane	12V	ug/L	NA	<	1

1,1-Dichloroethane	14V	ug/L	NA	<	1
1,2-Dichloroethane	15V	ug/L	NA	<	1
1,1-Dichloroethylene	16V	ug/L	NA	<	1
1,2-Dichloropropane	17V	ug/L	NA	<	1
1,3-Dichloropropylene	18V	ug/L	NA	<	1
Ethylbenzene	19V	ug/L	NA	<	1
Methyl Bromide	20V	ug/L	NA	<	5
Methyl Chloride	21V	ug/L	NA	<	5
Methylene Chloride	22V	ug/L	NA	<	10
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	1
Tetrachloroethylene	24V	ug/L	NA	<	1
Toluene	25V	ug/L	NA	<	1
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	1
1,1,1-Trichloroethane	27V	ug/L	NA	<	1
1,1,2-Trichloroethane	28V	ug/L	NA	<	1
Trichloroethylene	29V	ug/L	NA	<	1
Vinyl Chloride	31V	ug/L	NA	<	5
2-Chlorophenol	1A	ug/L	NA	<	10
2,4-Dichlorophenol	2A	ug/L	NA	<	10
2,4-Dimethylphenol	3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	50
2,4-Dinitrophenol	5A	ug/L	NA	<	50
2-Nitrophenol	6A	ug/L	NA	<	20
4-Nitrophenol	7A	ug/L	NA	<	50
p-Chloro-m-Cresol	8A	ug/L	NA	<	10
Pentachlorophenol	9A	ug/L	NA	<	50
Phenol	10A	ug/L	NA	<	10
2,4,6-Trichlorophenol	11A	ug/L	NA	<	10
Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10
2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10

Fluorene	32B	ug/L	NA	<	10
Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20
Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.02
Alpha-BHC	2P	ug/L	NA	<	0.02
Beta-BHC	3P	ug/L	NA	<	0.02
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.02
Delta-BHC	5P	ug/L	NA	<	0.02
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.03
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.02
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.03
Dieldrin	10P	ug/L	NA	<	0.02
Alpha-Endosulfan	11P	ug/L	NA	<	0.03
Beta-Endosulfan	12P	ug/L	NA	<	0.03
Endosulfan Sulfate	13P	ug/L	NA	<	0.03
Endrin	14P	ug/L	NA	<	0.05
Endrin Aldehyde	15P	ug/L	NA	<	0.05
Heptachlor	16P	ug/L	NA	<	0.03
Heptachlor Epoxide	17P	ug/L	NA	<	0.03
PCB-1242	18P	ug/L	NA	<	0.1
PCB-1254	19P	ug/L	NA	<	0.1
PCB-1221	20P	ug/L	NA	<	0.1
PCB-1232	21P	ug/L	NA	<	0.1
PCB-1248	22P	ug/L	NA	<	0.1
PCB-1260	23P	ug/L	NA	<	0.1
PCB-1016	24P	ug/L	NA	<	0.1
Toxaphene	25P	ug/L	NA	<	0.1

OUTFALL No.: **03A024 - Cooling Water (Technical Area 3-187)**
DISCHARGED TO: **Sandia Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
TSS	A.1.d	mg/L	1.4	9
Flow	A.1.f	MGD	0.00052	0.0014
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA	4.1
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	6	10
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	0.45	0.9
Tritium		pCi/L	327	205
Vanadium		ug/L	NA	0
Aluminum (T)	B.1.o	ug/L	450	800
Boron (T)	B.1.q	ug/L	10	100
Cobalt (T)	B.1.r	ug/L	0	0
Arsenic (T)	2M	ug/L	30	30

Cadmium	(T)	4M	ug/L	0	0
Chromium	(T)	5M	ug/L	100	100
Copper	(T)	6M	ug/L	0	0
Lead	(T)	7M	ug/L	0	0
Mercury	(T)	8M	ug/L	0	0
Zinc	(T)	13M	ug/L	100	100

OUTFALL No.: **03A027 - Cooling Water (Technical Area 3-285)**
DISCHARGED TO: **Sandia Canyon**
FREQUENCY: **Intermittent**

		2C NO.	UNITS	MONTH AVG	DAILY MAX
TSS		A.1.d	mg/L	1.8	10
Flow		A.1.f	MGD	0.03589	0.1080
Phosphorus, Total (as P)		B.1.i	ug/L	0.9	4
Radioactivity: Alpha, Total		B.1.j.(1)	pCi/L	NA	0.2
Radioactivity: Beta, Total		B.1.j.(2)	pCi/L	10.1	18.6
Radioactivity: Radium, Total		B.1.j.(3)	pCi/L	1.7	2.6
Tritium			pCi/L	67	200
Vanadium			ug/L	30	130
Boron	(T)	B.1.q	ug/L	70	200
Cobalt	(T)	B.1.r	ug/L	0	0
Arsenic	(T)	2M	ug/L	30	30
Cadmium	(T)	4M	ug/L	0	0
Chromium	(T)	5M	ug/L	30	100
Copper	(T)	6M	ug/L	0	0
Lead	(T)	7M	ug/L	0	0
Mercury	(T)	8M	ug/L	0	0
Zinc	(T)	13M	ug/L	0	0

OUTFALL No.: **03A028 - Cooling Water (Technical Area 15-202)**
DISCHARGED TO: **Water Canyon**
FREQUENCY: **Intermittent**

		2C NO.	UNITS	MONTH AVG	DAILY MAX
Flow		A.1.f	MGD	0.0043	0.0288
Chlorine (Total Residual)		B.1.b	ug/L	8	100
Phosphorus, Total (as P)		B.1.i	ug/L	1.76	15
Radioactivity: Alpha, Total		B.1.j.(1)	pCi/L	0.3	0.4
Radioactivity: Beta, Total		B.1.j.(2)	pCi/L	5	7.8
Radioactivity: Radium, Total		B.1.j.(3)	pCi/L	0.83	1.8
Tritium			pCi/L	121	300
Vanadium			ug/L	30	30
Aluminum	(T)	B.1.o	ug/L	100	100
Boron	(T)	B.1.q	ug/L	100	100
Cobalt	(T)	B.1.r	ug/L	0	0
Arsenic	(T)	2M	ug/L	18	280
Cadmium	(T)	4M	ug/L	0	0
Chromium	(T)	5M	ug/L	0	0
Copper	(T)	6M	ug/L	100	300
Lead	(T)	7M	ug/L	0	0
Mercury	(T)	8M	ug/L	0	0
Selenium	(T)	10M	ug/L	0	<3
Zinc	(T)	13M	ug/L	130	200

OUTFALL No.: **03A047 - Cooling Water (Technical Area 53-60)**
DISCHARGED TO: **Los Alamos Canyon**

FREQUENCY: Intermittent

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	7.2
TSS	A.1.d	mg/L	NA	6
Flow	A.1.f	MGD	0.02357	0.0864
COD	A.1.b	mg/L	NA	131
TOC	A.1.c	mg/L	NA	38
Ammonia (as N)	A.1.e	mg/L	NA	13
Bromide	B.1.a	ug/L	NA	14.9
Chlorine (Total Residual)	B.1.b	ug/L	23	600
Phosphorus, Total (as P)	B.1.i	ug/L	850	4000
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.5	6.41
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	21.9	45.7
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L		< 1.46
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA	0.22
Tritium		pCi/L	434	1302
Vanadium		ug/l	20	30
Aluminum (T)	B.1.o	ug/L	100	100
Boron (T)	B.1.q	ug/L	30	100
Cobalt (T)	B.1.r	ug/L	0	0
Molybdenum (T)	B.1.u	ug/L	NA	9400
Arsenic (T)	2M	ug/L	6	10
Cadmium (T)	4M	ug/L	0	0
Chromium (T)	5M	ug/L	0	0
Copper (T)	6M	ug/L	0	0
Lead (T)	7M	ug/L	0	0
Mercury (T)	8M	ug/L	0	0
Selenium (T)	10M	ug/L	NA	<3
Zinc (T)	13M	ug/L	30	100

OUTFALL No.: 03A048 - Cooling Water (Technical Area 53-62)
DISCHARGED TO: Los Alamos Canyon
FREQUENCY: Intermittent

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L		2.3
TSS	A.1.d	mg/L	1.6	8
Oil & Grease	B.1.h	mg/L	NA	< 5
Flow	A.1.f	MGD	0.06971	0.288
COD	A.1.b	mg/L	NA	25
TOC	A.1.c	mg/L	NA	7.3
Ammonia (as N)	A.1.e	mg/L	NA	0.6
Bromide	B.1.a	ug/L	NA	700
Chlorine (Total Residual)	B.1.b	ug/L	0	0
Color	B.1.c	nM	NA	< 5
Fluoride	B.1.e	ug/L	NA	< 500
Nitrate-Nitrite (N)	B.1.f	ug/L	NA	910
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA	1600
Phosphorus, Total (as P)	B.1.i	ug/L	630	2000
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0	0
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	7	10
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L		< 0.71
Radioactivity: Radium 226, Total	B.1.j.(4)	pCi/L	NA	< 0.71
Sulfate (as SO4)	B.1.k	ug/L	NA	31000
Sulfide (as S)	B.1.i	ug/L	NA	< 1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	< 3000

Surfactants	B.1.n	ug/L	NA	<	30
Aluminum (T)	B.1.o	ug/L	100		100
Barium (T)	B.1.p	ug/L	NA	<	32
Boron (T)	B.1.q	ug/L	30		100
Cobalt (T)	B.1.r	ug/L	0	<	10
Iron (T)	B.1.s	ug/L	NA		74
Magnesium (T)	B.1.t	ug/L	NA		3700
Molybdenum (T)	B.1.u	ug/L	NA		4300
Manganese (T)	B.1.v	ug/L	NA	<	10
Tin (T)	B.1.w	ug/L	NA	<	2000
Titanium (T)	B.1.x	ug/L	NA	<	30
Phenolics (Total Recoverable)	15M	ug/L	NA	<	50
Antimony (T)	1M	ug/L		<	3
Arsenic (T)	2M	ug/L	13		70
Beryllium (T)	3M	ug/L		<	3
Cadmium (T)	4M	ug/L	0	<	5
Chromium (T)	5M	ug/L	0	<	20
Copper (T)	6M	ug/L	130		1400
Lead (T)	7M	ug/L	0	<	30
Mercury (T)	8M	ug/L	0	<	0.2
Nickel (T)	9M	ug/L		<	20
Selenium (T)	10M	ug/L	0	<	3
Silver (T)	11M	ug/L		<	10
Thallium (T)	12M	ug/L		<	2
Zinc (T)	13M	ug/L	30		100
Cyanide (T)	14M	ug/L		<	20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	<	********
Acrolein	1V	ug/L	NA	<	50
Acrylonitrile	2V	ug/L	NA	<	50
Benzene	3V	ug/L	NA	<	10
Bromoform	5V	ug/L	NA	<	10
Carbon Tetrachloride	6V	ug/L	NA	<	10
Chlorobenzene	7V	ug/L	NA	<	50
Chlorodibromomethane	8V	ug/L	NA	<	10
Chloroethane	9V	ug/L	NA	<	10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<	50
Chloroform	11V	ug/L	NA	<	10
Dichlorobromomethane	12V	ug/L	NA	<	10
1,1-Dichloroethane	14V	ug/L	NA	<	10
1,2-Dichloroethane	15V	ug/L	NA	<	10
1,1-Dichloroethylene	16V	ug/L	NA	<	10
1,2-Dichloropropane	17V	ug/L	NA	<	10
1,3-Dichloropropylene	18V	ug/L	NA	<	10
Ethylbenzene	19V	ug/L	NA	<	10
Methyl Bromide	20V	ug/L	NA	<	50
Methyl Chloride	21V	ug/L	NA	<	50
Methylene Chloride	22V	ug/L	NA	<	20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	10
Tetrachloroethylene	24V	ug/L	NA	<	10
Toluene	25V	ug/L	NA	<	10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	10
1,1,1-Trichloroethane	27V	ug/L	NA	<	10
1,1,2-Trichloroethane	28V	ug/L	NA	<	10
Trichloroethylene	29V	ug/L	NA	<	10
Vinyl Chloride	31V	ug/L	NA	<	10
2-Chlorophenol	1A	ug/L	NA	<	8.617
2,4-Dichlorophenol	2A	ug/L	NA	<	8.617
2,4-Dimethylphenol	3A	ug/L	NA	<	8.617
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	43.085

2,4-Dinitrophenol	5A	ug/L	NA	<43.085
2-Nitrophenol	6A	ug/L	NA	<17.234
4-Nitrophenol	7A	ug/L	NA	<43.085
p-Chloro-m-Cresol	8A	ug/L	NA	< 8.617
Pentachlorophenol	9A	ug/L	NA	<43.085
Phenol	10A	ug/L	NA	< 8.617
2,4,6-Trichlorophenol	11A	ug/L	NA	< 8.617
Acenaphthene	1B	ug/L	NA	< 8.617
Acenaphthylene	2B	ug/L	NA	< 8.617
Anthracene	3B	ug/L	NA	< 8.617
Benzidine	4B	ug/L	NA	<43.085
Benzo(a)anthracene	5B	ug/L	NA	< 8.617
Benzo(a)pyrene	6B	ug/L	NA	< 8.617
3,4-Benzofluoranthene	7B	ug/L	NA	< 8.617
Benzo(ghi)perylene	8B	ug/L	NA	<17.234
Benzo(k)fluoranthene	9B	ug/L	NA	< 8.617
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	< 8.617
Bis(2-chloroethyl) Ether	11B	ug/L	NA	< 8.617
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	< 8.617
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	< 8.617
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	< 8.617
Butyl Benzyl Phthalate	15B	ug/L	NA	< 8.617
2-Chloronapthalene	16B	ug/L	NA	< 8.617
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	< 8.617
Chrysene	18B	ug/L	NA	< 8.617
Dibenzo(a,h)anthracene	19B	ug/L	NA	<17.234
1,2-Dichlorobenzene	20B	ug/L	NA	< 8.617
1,3-Dichlorobenzene	21B	ug/L	NA	< 8.617
1,4-Dichlorobenzene	22B	ug/L	NA	< 8.617
3,3'-Dichlorobenzidine	23B	ug/L	NA	<43.085
Diethyl Phthalate	24B	ug/L	NA	< 8.617
Dimethyl Phthalate	25B	ug/L	NA	< 8.617
Di-n-Butyl Phthalate	26B	ug/L	NA	< 8.617
2,4-Dinitrotoluene	27B	ug/L	NA	< 8.617
2,6-Dinitrotoluene	28B	ug/L	NA	< 8.617
Di-n-octyl Phthalate	29B	ug/L	NA	< 8.617
1,2-Diphenylhydrazine	30B	ug/L	NA	<17.234
Fluoranthene	31B	ug/L	NA	< 8.617
Fluorene	32B	ug/L	NA	< 8.617
Hexachlorobenzene	33B	ug/L	NA	< 8.617
Hexachlorobutadiene	34B	ug/L	NA	< 8.617
Hexachlorocyclopentadiene	35B	ug/L	NA	< 8.617
Hexachloroethane	36B	ug/L	NA	<17.234
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<17.234
Isophorone	38B	ug/L	NA	< 8.617
Naphthalene	39B	ug/L	NA	< 8.617
Nitrobenzene	40B	ug/L	NA	< 8.617
n-Nitrosodimethylamine	41B	ug/L	NA	<43.085
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<17.234
n-Nitrosodiphenylamine	43B	ug/L	NA	<17.234
Phenanthrene	44B	ug/L	NA	< 8.617
Pyrene	45B	ug/L	NA	< 8.617
1,2,4-Trichlorobenzene	46B	ug/L	NA	< 8.617
Aldrin	1P	ug/L	NA	< 0.2825
Alpha-BHC	2P	ug/L	NA	< 0.2825
Beta-BHC	3P	ug/L	NA	< 0.2825
Gamma-BHC [Lindane]	4P	ug/L	NA	< 0.2825
Delta-BHC	5P	ug/L	NA	< 0.2825
Chlordane	6P	ug/L	NA	< 0.56

4,4'-DDT	7P	ug/L	NA	< 0.565
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	< 0.565
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	< 0.565
Dieldrin	10P	ug/L	NA	< 0.565
Alpha-Endosulfan	11P	ug/L	NA	< 0.565
Beta-Endosulfan	12P	ug/L	NA	< 0.565
Endosulfan Sulfate	13P	ug/L	NA	< 0.565
Endrin	14P	ug/L	NA	< 0.565
Endrin Aldehyde	15P	ug/L	NA	< 0.565
Heptachlor	16P	ug/L	NA	< 0.2825
Heptachlor Epoxide	17P	ug/L	NA	< 0.2825
PCB-1242	18P	ug/L	NA	< 0.565
PCB-1254	19P	ug/L	NA	< 0.565
PCB-1221	20P	ug/L	NA	< 0.565
PCB-1232	21P	ug/L	NA	< 0.565
PCB-1248	22P	ug/L	NA	< 0.565
PCB-1260	23P	ug/L	NA	< 0.565
PCB-1016	24P	ug/L	NA	< 0.565
Toxaphene	25P	ug/L	NA	< 0.2825

OUTFALL No.: **03A049 - Cooling Water (Technical Area 53-64)**
DISCHARGED TO: **Los Alamos Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
TSS	A.1.d	mg/L	2.2	10
Flow	A.1.f	MGD	0.02288	0.064
Chlorine (Total Residual)	B.1.b	ug/L	54	1700
Phosphorus, Total (as P)	B.1.i	ug/L	1300	3000
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.36	0.4
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	14.5	20.4
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	0.87	1.7
Tritium		pCi/L	233	700
Vanadium		ug/L	23	30
Aluminum (T)	B.1.o	ug/L	100	100
Boron (T)	B.1.q	ug/L	70	100
Cobalt (T)	B.1.r	ug/L	0	0
Arsenic (T)	2M	ug/L	NA	70
Cadmium (T)	4M	ug/L	0	0
Chromium (T)	5M	ug/L	0	0
Copper (T)	6M	ug/L	0	0
Lead (T)	7M	ug/L	0	0
Mercury (T)	8M	ug/L	0	0
Selenium (T)	10M	ug/L	0	<3
Zinc (T)	13M	ug/L	0	100

OUTFALL No.: **03A113 - Cooling Water (Technical Area 53-293, 294, 1032, and LEDA)**
DISCHARGED TO: **Sandia Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG	DAILY MAX
BOD5	A.1.a	mg/L	NA	20.5
TSS	A.1.d	mg/L	3.9	29
Flow	A.1.f	MGD	0.0109	0.0792
COD	A.1.b	mg/L	NA	22
TOC	A.1.c	mg/L	NA	8.2

Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA		2900
Chlorine (Total Residual)	B.1.b	ug/L	46		2500
Phosphorus, Total (as P)	B.1.i	ug/L	1200		7000
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.8		1.2
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	8.6		14
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	NA		3.94
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA		0.69
Tritium		pCi/L	432		700
Vanadium		ug/L	27		30
Aluminum (T)	B.1.o	ug/L	100		100
Boron (T)	B.1.q	ug/L	70		100
Cobalt (T)	B.1.r	ug/L	0		0
Molybdenum (T)	B.1.u	ug/L	NA		720
Arsenic (T)	2M	ug/L	NA		10
Cadmium (T)	4M	ug/L	0		0
Chromium (T)	5M	ug/L	0		0
Copper (T)	6M	ug/L	0		0
Lead (T)	7M	ug/L	0		0
Mercury (T)	8M	ug/L	0		0
Selenium (T)	10M	ug/L	0		<3
Zinc (T)	13M	ug/L	30		100

OUTFALL No.: **03A130 - Cooling Water (Technical Area 11-30)**
DISCHARGED TO: **Water Canyon**
FREQUENCY: **Intermittent**

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA	<	2
TSS	A.1.d	mg/L	NA	<	1
Flow	A.1.f	MGD	0.00408		0.0216
COD	A.1.b	mg/L	NA	<	1
TOC	A.1.c	mg/L	NA	<	0.7
Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA	<	500
Phosphorus, Total (as P)	B.1.i	ug/L	1390		5000
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	0.2		2.96
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	4.7		10
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	1.57		3
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA		0.54
Tritium		pCi/L	NA		0
Vanadium		ug/L	7		10
Aluminum (T)	B.1.o	ug/L	100		100
Boron (T)	B.1.q	ug/L	70		100
Cobalt (T)	B.1.r	ug/L	0		0
Molybdenum (T)	B.1.u	ug/L	NA	<	20
Arsenic (T)	2M	ug/L	1		10
Cadmium (T)	4M	ug/L	0		0
Chromium (T)	5M	ug/L	30		100
Copper (T)	6M	ug/L	20		600
Lead (T)	7M	ug/L	0		0
Mercury (T)	8M	ug/L	0		0
Selenium (T)	10M	ug/L	0		<3
Zinc (T)	13M	ug/L	30		100

OUTFALL NO: 03A158 - Cooling Tower Blowdown (Technical Area 21-209)
DISCHARGED TO: Los Alamos Canyon
FREQUENCY: Intermittent

		2C NO.	UNITS	MONTH AVG	DAILY MAX
TSS		A.1.d	mg/L	1.2	6
Flow		A.1.f	MGD	0.00285	0.0065
Chlorine (Total Residual)		B.1.b	ug/L	10	100
Phosphorus, Total (as P)		B.1.i	ug/L	130	1000
Radioactivity: Alpha, Total		B.1.j.(1)	pCi/L	0.5	0.7
Radioactivity: Beta, Total		B.1.j.(2)	pCi/L	3.3	4.4
Radioactivity: Radium, Total		B.1.j.(3)	pCi/L	1.4	3.7
Tritium			pCi/L	1230	3090
Aluminum	(T)	B.1.o	ug/L	NA	100
Boron	(T)	B.1.q	ug/L	70	100
Cobalt	(T)	B.1.r	ug/L	NA	0
Arsenic	(T)	2M	ug/L	10	10
Cadmium	(T)	4M	ug/L	NA	0
Chromium	(T)	5M	ug/L	NA	0
Copper	(T)	6M	ug/L	NA	0
Lead	(T)	7M	ug/L	NA	0
Mercury	(T)	8M	ug/L	NA	0
Selenium	(T)	10M	ug/L	NA	< 3
Zinc	(T)	13M	ug/L	30	100

OUTFALL NO: 03A160 - Cooling Tower Blowdown (Technical Area 35-124)
DISCHARGED TO: Ten Site Canyon
FREQUENCY: Intermittent

		2C NO.	UNITS	MONTH AVG	DAILY MAX
TSS		A.1.d	mg/L	31.5	54
Flow		A.1.f	MGD	0.0576	0.0576
Chlorine (Total Residual)		B.1.b	ug/L	NA	0
Phosphorus, Total (as P)		B.1.i	ug/L	1500	2000
Radioactivity: Alpha, Total		B.1.j.(1)	pCi/L	NA	2.9
Radioactivity: Beta, Total		B.1.j.(2)	pCi/L	NA	20
Radioactivity: Radium, Total		B.1.j.(3)	pCi/L	7.6	10.6
Tritium			pCi/L	205	327
Vanadium			ug/L	NA	0
Aluminum	(T)	B.1.o	ug/L	150	200
Boron	(T)	B.1.q	ug/L	50	100
Cobalt	(T)	B.1.r	ug/L	NA	0
Arsenic	(T)	2M	ug/L		0
Cadmium	(T)	4M	ug/L	NA	0
Chromium	(T)	5M	ug/L	NA	0
Copper	(T)	6M	ug/L	NA	0
Lead	(T)	7M	ug/L	NA	0
Mercury	(T)	8M	ug/L	NA	0
Selenium	(T)	10M	ug/L	NA	<3
Zinc	(T)	13M	ug/L	150	200

OUTFALL NO: 03A181 - Cooling Tower Blowdown (Technical Area 55-6)
DISCHARGED TO: Tributary to Mortandad Canyon
FREQUENCY: Intermittent

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA		6.3
TSS	A.1.d	mg/L	1.3		9
Oil & Grease	B.1.h	mg/L	NA		8.4
Fecal Coliform	B.1.d	#/100 ml	NA	<	1
Flow	A.1.f	MGD	0.02232		0.0432
COD	A.1.b	mg/L	NA		75
TOC	A.1.c	mg/L	NA		27
Ammonia (as N)	A.1.e	mg/L	NA	<	0.2
Bromide	B.1.a	ug/L	NA	<	500
Chlorine (Total Residual)	B.1.b	ug/L	NA		210
Color	B.1.c	nM	NA	<	5
Fluoride	B.1.e	ug/L	NA		500
Nitrate-Nitrite (N)	B.1.f	ug/L	NA		960
Organic Nitrogen, Total (as N)	B.1.G	ug/L	NA		1800
Phosphorus, Total (as P)	B.1.i	ug/L	1450		5620
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA		0.3
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	NA		18
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L	3.67		8.3
Radioactivity: Radium 226	B.1.j.(4)	pCi/L	NA		1.95
Tritium		pCi/L	360		900
Vanadium		ug/L	30		30
Sulfate (as SO4)	B.1.k	ug/L	NA		5.8
Sulfide (as S)	B.1.i	ug/L	NA	<	1000
Sulfite: (as SO3)	B.1.m	ug/L	NA	<	3000
Surfactants	B.1.n	ug/L	NA	<	30
Aluminum (T)	B.1.o	ug/L	100		100
Barium (T)	B.1.p	ug/L	NA		60
Boron (T)	B.1.q	ug/L	100		100
Cobalt (T)	B.1.r	ug/L	NA		0
Iron (T)	B.1.s	ug/L	NA	<	200
Magnesium (T)	B.1.t	ug/L	NA		7400
Molybdenum (T)	B.1.u	ug/L	NA	<	500
Manganese (T)	B.1.v	ug/L	NA	<	10
Tin (T)	B.1.w	ug/L	NA	<	2000
Titanium (T)	B.1.x	ug/L	NA	<	30
Phenolics (Total Recoverable)	15M	ug/L	NA	<	50
Antimony (T)	1M	ug/L	NA	<	50
Arsenic (T)	2M	ug/L			10
Beryllium (T)	3M	ug/L	NA	<	4
Cadmium (T)	4M	ug/L	NA	<	8
Chromium (T)	5M	ug/L	NA	<	40
Copper (T)	6M	ug/L	NA	<	40
Lead (T)	7M	ug/L	NA		100
Mercury (T)	8M	ug/L	NA		0.4
Nickel (T)	9M	ug/L	NA	<	40
Selenium (T)	10M	ug/L	NA	<	3
Silver (T)	11M	ug/L	NA	<	10
Thallium (T)	12M	ug/L	NA	<	100
Zinc (T)	13M	ug/L	30		100
Cyanide (T)	14M	ug/L	NA	<	20
2,3,7,8-TCDD	DIOXIN	ug/L	NA	<	*********
Acrolein	1V	ug/L	NA	<	50
Acrylonitrile	2V	ug/L	NA	<	50
Benzene	3V	ug/L	NA	<	10
Bromoform	5V	ug/L	NA	<	10
Carbon Tetrachloride	6V	ug/L	NA	<	10
Chlorobenzene	7V	ug/L	NA	<	50
Chlorodibromomethane	8V	ug/L	NA	<	10

Chloroethane	9V	ug/L	NA	<	10
2-Chloroethyl Vinyl Ether	10V	ug/L	NA	<	50
Chloroform	11V	ug/L	NA	<	10
Dichlorobromomethane	12V	ug/L	NA	<	10
1,1-Dichloroethane	14V	ug/L	NA	<	10
1,2-Dichloroethane	15V	ug/L	NA	<	10
1,1-Dichloroethylene	16V	ug/L	NA	<	10
1,2-Dichloropropane	17V	ug/L	NA	<	10
1,3-Dichloropropylene	18V	ug/L	NA	<	10
Ethylbenzene	19V	ug/L	NA	<	10
Methyl Bromide	20V	ug/L	NA	<	50
Methyl Chloride	21V	ug/L	NA	<	50
Methylene Chloride	22V	ug/L	NA	<	20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	10
Tetrachloroethylene	24V	ug/L	NA	<	10
Toluene	25V	ug/L	NA	<	10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	10
1,1,1-Trichloroethane	27V	ug/L	NA	<	10
1,1,2-Trichloroethane	28V	ug/L	NA	<	10
Trichloroethylene	29V	ug/L	NA	<	10
Vinyl Chloride	31V	ug/L	NA	<	10
2-Chlorophenol	1A	ug/L	NA	<	10
2,4-Dichlorophenol	2A	ug/L	NA	<	10
2,4-Dimethylphenol	3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	50
2,4-Dinitrophenol	5A	ug/L	NA	<	50
2-Nitrophenol	6A	ug/L	NA	<	20
4-Nitrophenol	7A	ug/L	NA	<	50
p-Chloro-m-Cresol	8A	ug/L	NA	<	10
Pentachlorophenol	9A	ug/L	NA	<	50
Phenol	10A	ug/L	NA	<	10
2,4,6-Trichlorophenol	11A	ug/L	NA	<	10
Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10

2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10
Fluorene	32B	ug/L	NA	<	10
Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20
Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.06
Alpha-BHC	2P	ug/L	NA	<	0.06
Beta-BHC	3P	ug/L	NA	<	0.06
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.06
Delta-BHC	5P	ug/L	NA	<	0.06
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.1
Dieldrin	10P	ug/L	NA	<	0.1
Alpha-Endosulfan	11P	ug/L	NA	<	0.1
Beta-Endosulfan	12P	ug/L	NA	<	0.1
Endosulfan Sulfate	13P	ug/L	NA	<	0.1
Endrin	14P	ug/L	NA	<	0.1
Endrin Aldehyde	15P	ug/L	NA	<	0.1
Heptachlor	16P	ug/L	NA	<	0.06
Heptachlor Epoxide	17P	ug/L	NA	<	0.06
PCB-1242	18P	ug/L	NA	<	1.2
PCB-1254	19P	ug/L	NA	<	1.2
PCB-1221	20P	ug/L	NA	<	1.2
PCB-1232	21P	ug/L	NA	<	1.2
PCB-1248	22P	ug/L	NA	<	1.2
PCB-1260	23P	ug/L	NA	<	1.2
PCB-1016	24P	ug/L	NA	<	1.2
Toxaphene	25P	ug/L	NA	<	6

OUTFALL NO: **03A185 - Cooling Tower Blowdown (Technical Area 15-312)**
DISCHARGED TO: **Tributary to Water Canyon**
FREQUENCY: **Intermittent**

This Outfall is not presently discharging. The effluent is expected to be similar to Outfall 03A181. Data presented below are from Outfall 03A181.

	2C NO.	UNITS	MONTH AVG		DAILY MAX
BOD5	A.1.a	mg/L	NA		6.3
TSS	A.1.d	mg/L	1.3		9
Oil & Grease	B.1.h	mg/L	NA		8.4
Fecal Coliform	B.1.d	#/100 ml	NA	<	1

Flow (Estimate)	A.1.f	MGD		NA		0.0432
COD	A.1.b	mg/L		NA		75
TOC	A.1.c	mg/L		NA		27
Ammonia (as N)	A.1.e	mg/L		NA	<	0.2
Bromide	B.1.a	ug/L		NA	<	500
Chlorine (Total Residual)	B.1.b	ug/L	NA			210
Color	B.1.c	nM		NA	<	5
Fluoride	B.1.e	ug/L		NA		500
Nitrate-Nitrite (N)	B.1.f	ug/L		NA		960
Organic Nitrogen, Total (as N)	B.1.G	ug/L		NA		1800
Phosphorus, Total (as P)	B.1.i	ug/L		1450		5620
Radioactivity: Alpha, Total	B.1.j.(1)	pCi/L	NA			0.3
Radioactivity: Beta, Total	B.1.j.(2)	pCi/L	NA			18
Radioactivity: Radium, Total	B.1.j.(3)	pCi/L		3.67		8.3
Radioactivity: Radium 226	B.1.j.(4)	pCi/L		NA		1.95
Tritium		pCi/L		360		900
Vanadium		ug/L		30		30
Sulfate (as SO4)	B.1.k	ug/L		NA		5.8
Sulfide (as S)	B.1.i	ug/L		NA	<	1000
Sulfite: (as SO3)	B.1.m	ug/L		NA	<	3000
Surfactants	B.1.n	ug/L		NA	<	30
Aluminum (T)	B.1.o	ug/L		100		100
Barium (T)	B.1.p	ug/L		NA		60
Boron (T)	B.1.q	ug/L		100		100
Cobalt (T)	B.1.r	ug/L		NA		0
Iron (T)	B.1.s	ug/L		NA	<	200
Magnesium (T)	B.1.t	ug/L		NA		7400
Molybdenum (T)	B.1.u	ug/L		NA	<	500
Manganese (T)	B.1.v	ug/L		NA	<	10
Tin (T)	B.1.w	ug/L		NA	<	2000
Titanium (T)	B.1.x	ug/L		NA	<	30
Phenolics (Total Recoverable)	15M	ug/L		NA	<	50
Antimony (T)	1M	ug/L		NA	<	50
Arsenic (T)	2M	ug/L				10
Beryllium (T)	3M	ug/L		NA	<	4
Cadmium (T)	4M	ug/L		NA	<	8
Chromium (T)	5M	ug/L		NA	<	40
Copper (T)	6M	ug/L		NA	<	40
Lead (T)	7M	ug/L		NA		100
Mercury (T)	8M	ug/L		NA		0.4
Nickel (T)	9M	ug/L		NA	<	40
Selenium (T)	10M	ug/L		NA	<	3
Silver (T)	11M	ug/L		NA	<	10
Thallium (T)	12M	ug/L		NA	<	100
Zinc (T)	13M	ug/L		30		100
Cyanide (T)	14M	ug/L		NA	<	20
2,3,7,8-TCDD	DIOXIN	ug/L		NA	<	*********
Acrolein	1V	ug/L		NA	<	50
Acrylonitrile	2V	ug/L		NA	<	50
Benzene	3V	ug/L		NA	<	10
Bromoform	5V	ug/L		NA	<	10
Carbon Tetrachloride	6V	ug/L		NA	<	10
Chlorobenzene	7V	ug/L		NA	<	50
Chlorodibromomethane	8V	ug/L		NA	<	10
Chloroethane	9V	ug/L		NA	<	10
2-Chloroethyl Vinyl Ether	10V	ug/L		NA	<	50
Chloroform	11V	ug/L		NA	<	10
Dichlorobromomethane	12V	ug/L		NA	<	10
1,1-Dichloroethane	14V	ug/L		NA	<	10

1,2-Dichloroethane	15V	ug/L	NA	<	10
1,1-Dichloroethylene	16V	ug/L	NA	<	10
1,2-Dichloropropane	17V	ug/L	NA	<	10
1,3-Dichloropropylene	18V	ug/L	NA	<	10
Ethylbenzene	19V	ug/L	NA	<	10
Methyl Bromide	20V	ug/L	NA	<	50
Methyl Chloride	21V	ug/L	NA	<	50
Methylene Chloride	22V	ug/L	NA	<	20
1,1,2,2-Tetrachloroethane	23V	ug/L	NA	<	10
Tetrachloroethylene	24V	ug/L	NA	<	10
Toluene	25V	ug/L	NA	<	10
1,2-trans-Dichloroethylene	26V	ug/L	NA	<	10
1,1,1-Trichloroethane	27V	ug/L	NA	<	10
1,1,2-Trichloroethane	28V	ug/L	NA	<	10
Trichloroethylene	29V	ug/L	NA	<	10
Vinyl Chloride	31V	ug/L	NA	<	10
2-Chlorophenol	1A	ug/L	NA	<	10
2,4-Dichlorophenol	2A	ug/L	NA	<	10
2,4-Dimethylphenol	3A	ug/L	NA	<	10
4,6-Dinitro-o-Cresol	4A	ug/L	NA	<	50
2,4-Dinitrophenol	5A	ug/L	NA	<	50
2-Nitrophenol	6A	ug/L	NA	<	20
4-Nitrophenol	7A	ug/L	NA	<	50
p-Chloro-m-Cresol	8A	ug/L	NA	<	10
Pentachlorophenol	9A	ug/L	NA	<	50
Phenol	10A	ug/L	NA	<	10
2,4,6-Trichlorophenol	11A	ug/L	NA	<	10
Acenaphthene	1B	ug/L	NA	<	10
Acenaphthylene	2B	ug/L	NA	<	10
Anthracene	3B	ug/L	NA	<	10
Benzidine	4B	ug/L	NA	<	50
Benzo(a)anthracene	5B	ug/L	NA	<	10
Benzo(a)pyrene	6B	ug/L	NA	<	10
3,4-Benzofluoranthene	7B	ug/L	NA	<	10
Benzo(ghi)perylene	8B	ug/L	NA	<	20
Benzo(k)fluoranthene	9B	ug/L	NA	<	10
Bis(2-chloroethoxy) Methane	10B	ug/L	NA	<	10
Bis(2-chloroethyl) Ether	11B	ug/L	NA	<	10
Bis(2-chloroisopropyl) Ether	12B	ug/L	NA	<	10
Bis(2-ethylhexyl) Phthalate	13B	ug/L	NA	<	10
4-Bromophenyl Phenyl Ether	14B	ug/L	NA	<	10
Butyl Benzyl Phthalate	15B	ug/L	NA	<	10
2-Chloronapthalene	16B	ug/L	NA	<	10
4-Chlorophenyl Phenyl Ether	17B	ug/L	NA	<	10
Chrysene	18B	ug/L	NA	<	10
Dibenzo(a,h)anthracene	19B	ug/L	NA	<	20
1,2-Dichlorobenzene	20B	ug/L	NA	<	10
1,3-Dichlorobenzene	21B	ug/L	NA	<	10
1,4-Dichlorobenzene	22B	ug/L	NA	<	10
3,3'-Dichlorobenzidine	23B	ug/L	NA	<	50
Diethyl Phthalate	24B	ug/L	NA	<	10
Dimethyl Phthalate	25B	ug/L	NA	<	10
Di-n-Butyl Phthalate	26B	ug/L	NA	<	10
2,4-Dinitrotoluene	27B	ug/L	NA	<	10
2,6-Dinitrotoluene	28B	ug/L	NA	<	10
Di-n-octyl Phthalate	29B	ug/L	NA	<	10
1,2-Diphenylhydrazine	30B	ug/L	NA	<	20
Fluoranthene	31B	ug/L	NA	<	10
Fluorene	32B	ug/L	NA	<	10

Hexachlorobenzene	33B	ug/L	NA	<	10
Hexachlorobutadiene	34B	ug/L	NA	<	10
Hexachlorocyclopentadiene	35B	ug/L	NA	<	10
Hexachloroethane	36B	ug/L	NA	<	20
Indeno (1,2,3-cd) Pyrene	37B	ug/L	NA	<	20
Isophorone	38B	ug/L	NA	<	10
Naphthalene	39B	ug/L	NA	<	10
Nitrobenzene	40B	ug/L	NA	<	10
n-Nitrosodimethylamine	41B	ug/L	NA	<	50
n-Nitrosodi-n-Propylamine	42B	ug/L	NA	<	20
n-Nitrosodiphenylamine	43B	ug/L	NA	<	20
Phenanthrene	44B	ug/L	NA	<	10
Pyrene	45B	ug/L	NA	<	10
1,2,4-Trichlorobenzene	46B	ug/L	NA	<	10
Aldrin	1P	ug/L	NA	<	0.06
Alpha-BHC	2P	ug/L	NA	<	0.06
Beta-BHC	3P	ug/L	NA	<	0.06
Gamma-BHC [Lindane]	4P	ug/L	NA	<	0.06
Delta-BHC	5P	ug/L	NA	<	0.06
Chlordane	6P	ug/L	NA	<	0.1
4,4'-DDT	7P	ug/L	NA	<	0.1
4,4'-DDE [p,p-DDX]	8P	ug/L	NA	<	0.1
4,4'-DDD [p,p-TDE]	9P	ug/L	NA	<	0.1
Dieldrin	10P	ug/L	NA	<	0.1
Alpha-Endosulfan	11P	ug/L	NA	<	0.1
Beta-Endosulfan	12P	ug/L	NA	<	0.1
Endosulfan Sulfate	13P	ug/L	NA	<	0.1
Endrin	14P	ug/L	NA	<	0.1
Endrin Aldehyde	15P	ug/L	NA	<	0.1
Heptachlor	16P	ug/L	NA	<	0.06
Heptachlor Epoxide	17P	ug/L	NA	<	0.06
PCB-1242	18P	ug/L	NA	<	1.2
PCB-1254	19P	ug/L	NA	<	1.2
PCB-1221	20P	ug/L	NA	<	1.2
PCB-1232	21P	ug/L	NA	<	1.2
PCB-1248	22P	ug/L	NA	<	1.2
PCB-1260	23P	ug/L	NA	<	1.2
PCB-1016	24P	ug/L	NA	<	1.2
Toxaphene	25P	ug/L	NA	<	6

APPENDIX B1 WATER QUALITY STANDARDS, CALCULATION OF NUMERICAL STANDARDS-BASED EFFLUENT LIMITATIONS

Effluent limitations for metals were converted from the dissolved fraction specified in New Mexico's Water Quality Standards using the following equations which can also be found in the Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams.

$$K_p = K_{po} * TSS^{\alpha}$$

$$\frac{C}{C_t} = \frac{1}{1 + (K_p)(TSS)(10^{-6})}$$

$$\text{Total Metal Limit} = \frac{C_r}{C/C_t}$$

where:

K_p	=	Linear partition coefficient
K_{po}	=	found in table below
α	=	found in table below
TSS	=	total suspended solids concentration found in receiving stream or approximation thereof, geometric mean, unit of mg/l
C/C_t	=	Dissolved fraction of metal
C_r	=	Dissolved criteria value from water quality standards

Linear Partition Coefficients for Priority Metals in Streams

Metal	K_{po}	α
Arsenic	$0.48 * 10^6$	- 0.73
Chromium	$3.36 * 10^6$	- 0.93
Copper	$1.04 * 10^6$	- 0.74
Lead	$2.80 * 10^6$	- 0.80
Nickel	$0.49 * 10^6$	- 0.57
Zinc	$1.25 * 10^6$	- 0.70

Total metals limits were calculated based on the Total Suspended Solids (TSS) concentration reported for each outfall. For discharges to perennial streams, the in-stream TSS concentration would be used for the calculations. However, since the receiving streams at Los Alamos National Laboratory are intermittent, the effluent TSS concentration was used to determine the total to dissolved metals ratio. The results of those calculations are shown in the following table.

Total Metals Limits (mg/l)

Metal	**Criteria**	**Total Suspended Solids Concentration (mg/l)**							
		1	2	3	4	6	7	8	31.5
Arsenic	0.2	0.296	0.316	0.329	0.34	0.356	0.362	0.368	0.444
Chromium	1.0	4.36	4.527	4.629	4.702	4.809	4.85	4.886	5.278
Copper	0.5	1.02	1.123	1.192	1.246	1.329	1.362	1.393	1.775
Lead	0.1	0.38	0.421	0.449	0.469	0.501	0.513	0.524	0.658
Zinc	25.0	56.25	63.47	68.45	72.37	78.5	81.0	83.3	113.0

Other Applicable Water Quality Standards

Dissolved Aluminum	5.0 mg/l
Dissolved Boron	5.0 mg/l
Dissolved Cobalt	1.0 mg/l
Dissolved Cadmium	50 ug/l
Total Mercury	0.012 ug/l
Total Recoverable Selenium	2.0 ug/l
Dissolved Vanadium	100 ug/l
Radium-226 + Radium-228	30 pCi/l
Tritium	20,000 pCi/l

In cases where there is no method to convert the dissolved standard to the total metal concentration in the implementation plan, the dissolved standard is treated as total for the purposes of establishing permit limits. The Total Suspended Solids concentrations used above to calculate limits is an estimation of the average effluent concentration obtained from the facility's discharge monitoring report forms.

APPENDIX B2 WATER QUALITY STANDARDS, MINIMUM QUANTIFICATION LEVELS (MQLs)

	MQL (µg/L)
Aluminum	100
Barium	100
Boron	100
Residual Chlorine (Total)	100
Cobalt	50
Nitrate as N	100
Vanadium	50
Antimony (Total)	60
Arsenic (Total)	10
Beryllium (Total)	5
Cadmium (Total)	1
Chromium (Total)	10
Chromium (3+)	10
Chromium (6+)	10
Copper (Total)	10
Lead (Total)	5
Mercury (Total)	0.2
Nickel (Total)	5
Selenium (Total)	5
Silver (Total)	2
Thallium (Total)	10
Zinc (Total)	20
Cyanide (Total)	20
Cyanide (Amenable)	20
Chlordane	0.2

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40CFR136. For any pollutant for which the permittee determines an effluent specific MDL, the permittee shall send to EPA Region 6 a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that the effluent specific MDL was correctly calculated. An effluent specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

$$MQL = 3.3 \times MDL$$

Upon written approval by EPA Region 6, the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) calculations and reporting requirements.

APPENDIX C POLICY FOR POST THIRD ROUND NPDES PERMITTING

Original document signed September 9, 1992, by Myron O. Knudson, Director, Water Management Division, U.S. EPA Region 6

I. EPA NATIONAL POLICY

The Water Quality Act states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In addressing this, the Environmental Protection Agency's national policy for issuance of third round NPDES permits was published in the Federal Register in March 9, 1984. This policy states that, "... the Environmental Protection Agency (EPA) will use an integrated strategy consisting of both biological and chemical methods to address toxic and nonconventional pollutants from industrial and municipal sources. In addition to enforcing specific numerical criteria, EPA and the States will use biological techniques and available data on chemical effects to assess toxicity impacts and human health hazards..."

II. EPA REGULATORY AUTHORITY

On June 2, 1989, EPA promulgated national regulations for the issuance of third round NPDES permits. Section 122.44(d)(1) of Title 40 of the Code of Federal Regulations requires EPA and the delegated states to evaluate each NPDES permit for the potential to exceed state numerical or narrative water quality standards, including those for toxics, and to establish effluent limitations for those facilities with the "reasonable potential" to exceed those standards. These regulations require both chemical specific limits, based on the state numerical water quality standards or other criteria developed by EPA, and whole effluent toxicity effluent limits, where appropriate.

III. EPA REGION 6 POLICY

A. The Region 6 implementation strategy is designed to support and implement the national policy. The regional policy is that no source (industrial, municipal, or federal facility) will be allowed to discharge any wastewater which:

1. Results in the endangerment of a drinking water supply;
2. Results in aquatic bioaccumulation which threatens human health;
3. Results in instream acute or chronic aquatic toxicity; or
4. Causes a violation of an applicable general or numerical state water quality standard.

B. In order to accomplish these objectives Region 6 will, as part of the post third round permit issuance procedures:

1. Ensure that no source will cause, or significantly contribute to, an exceedence of state water quality standards which protect public drinking water supplies;
2. Ensure that no source will cause, or significantly contribute to, an exceedence of state water quality standards for aquatic bioaccumulation which threatens human health;
3. Identify and address sources which may exceed EPA Water Quality Criteria for human health protection;
4. Address known aquatic toxicity by applying appropriate chemical specific and/or whole effluent toxicity limitations or toxicity reduction requirements when a reasonable potential for toxic conditions exists.

APPENDIX D POST THIRD ROUND NPDES PERMIT IMPLEMENTATION STRATEGY

Adopted October 1, 1992

Original document signed September 9, 1992, by Jack V. Ferguson, Chief, Permits Branch, Water Management Division, U.S. EPA Region 6

I. PREAMBLE

A. BACKGROUND

Over the history of the NPDES permit program, the Environmental Protection Agency (EPA) has focused on two primary concepts to abate the discharge of pollutants. First, EPA has utilized a technology-based control approach. This was reflected in permits originally issued with requirements for secondary treatment (municipalities) and Best Practicable Control Technology Currently Available (industries). More recently permits have required implementation of the Best Conventional Pollutant Control Technology, Best Available Technology Economically Achievable (industries) and pretreatment program development (municipalities).

Secondly, EPA has addressed water quality as impacted primarily by conventional (or oxygen demanding) parameters. This has occurred through the use of specific state water quality standards (and the resulting water quality management plans) for specific pollutants.

EPA Region 6 moved into the "third round" of NPDES permits in 1987. The focus of these "post BAT" permits is to move beyond our first two phases of control and insure that adequate controls are being implemented to confirm that human health and aquatic life are being adequately protected on a site-specific receiving stream basis. Region 6 developed its third round policy on March 11, 1987, and adopted a strategy to implement this policy on April 1, 1987, revised October 31, 1989.

B. EPA NATIONAL POLICY

The Clean Water Act states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." In addressing this, the EPA outlined the national policy objectives for development of post-BAT NPDES permit limitations (third round) in the March 9, 1984, Federal Register. This policy states that "to control pollutants beyond Best Available Technology Economically Achievable (BAT), secondary treatment, and other Clean Water Technology-based requirements in order to meet state water quality standards, the EPA will use an integrated strategy consisting of both biological and chemical methods to address toxic and nonconventional pollutants from industrial and municipal sources. Where State standards contain numerical criteria for toxic pollutants, NPDES permits will contain limits as necessary to assure compliance with these standards. In addition to enforcing specific numerical criteria, EPA and the States will use biological techniques and available data on chemical effects to assess toxicity impacts and human health hazards based on the general standard of 'no toxic materials in toxic amounts'."

Where violations of water quality standards are identified or projected, EPA and the States will develop water quality based effluent limits for inclusion in any issued permit. Where there is a significant likelihood of toxic effects to biota in the receiving stream, EPA and the States may impose permit limits on effluent toxicity and may require an NPDES permittee to conduct a toxicity reduction evaluation. Where toxic effects are present but there is a significant likelihood that compliance with technology based requirements will sufficiently mitigate the effects, EPA and the States may require chemical and toxicity testing after installation of treatment and may reopen the permit to incorporate additional limitations if needed to meet water quality standards.

C. NATIONAL REGULATIONS

Section 122.44(d)(1) of Title 40 of the Code of Federal Regulations requires EPA and the delegated states to evaluate each NPDES permit for the potential to exceed a state numerical or narrative water quality standards, including those for toxics, and to establish effluent limits for those facilities with the "reasonable potential" to exceed those standards. These regulations require chemical specific limits, based on state numerical water quality standards or other criteria developed by EPA, and whole effluent toxicity effluent limits.

D. EPA REGION 6 IMPLEMENTATION STRATEGY

The Region 6 implementation strategy is designed to support and implement the regional policy of March 11, 1987. The intent of this strategy is that there shall be no discharge of any wastewater from any source (industrial, municipal, or federal facility) which:

1. Results in the endangerment of any drinking water supply;

2. Results in aquatic bioaccumulation which endangers human health;

3. Results in any instream acute or chronic aquatic toxicity after dilution; or

4. Violates any other applicable general or numerical state water quality standard.

II. OVERVIEW

A. GOAL

The goal of the regional policy is to assure that there are "no toxic materials in toxic amounts" in waters of the United States; this is stated in the Water Quality Act as the national policy. The specific areas of concern are human health protection and aquatic biota protection. The goal of the Office of Water Third Round Permit Issuance Strategy (to eliminate toxics as expeditiously as possible) will be achieved by industrial, municipal, and federal discharges in Region 6.

B. GENERAL IMPLEMENTATION PROCEDURE

1. In accordance with the priorities listed below, all potential significant contributors to toxicity will be evaluated at permit issuance, or when modifications are requested for new processes or expansions. Also, discharges in known areas of ambient toxicity will be evaluated. This evaluation will consist of a review of both specific chemical data and toxicity testing data representative of the facility's discharge into the receiving water. The review will consist of a projection of ambient impacts at appropriate critical low river flow conditions or at the appropriate mixing zone conditions for bays, lakes, and estuaries.

2. Routine biomonitoring and, where appropriate, chemical specific monitoring of discharges will be required for all major dischargers. New sources shall be required to comply with appropriate whole effluent toxicity limits.

3. Increased monitoring of discharges may be required in areas of suspected ambient toxicity problems to confirm the presence and causes of ambient toxicity. Suspected toxicity will be verified by toxicity testing, specific chemical evaluations and/or bioassessments.

4. Appropriate controls will he establisbed to correct identified problems at permit reissuance, or by reopening the permit, if necessary to prevent ambient toxicity.

C. PRIORITIES

The regional policy will be implemented to the maximum extent possible given available EPA and state resources in accordance with the following priorities:

1. Facilities with known or suspected toxicity problems.

2. Facilities discharging to priority water bodies.

3. Other major industrial, municipal and federal facilities.

4. Other minor industrial and federal facilities.

5. Other minor municipal facilities.

6. Stormwater only facilities.

D. CONTROL MEASURES

The following general control measures will be utilized to implement the policy:

1. Specific chemical effluent limits, and/or

2. Whole effluent toxicity testing on a flow weighted composite sample of all discharges from a facility into a receiving stream. The results of such testing may trigger a requirement to conduct a toxicity reduction evaluation and/or the imposition of whole effluent toxicity limitations; and/or

3. Pollution prevention measures and best management practices; and/or

4. No facility will be allowed to discharge in excess of the technology based limit for that specific chemical and discharge type.

III. HUMAN HEALTH PROTECTION (SPECIFIC CHEMICAL)

A. STATE NUMERICAL STANDARDS

Permits written under this strategy will establish effluent limits, if specific chemical state water quality standards, established for protection of human health, have a reasonable potential to be exceeded. Permits will implement all waste load allocations as specified in the water quality management plan.

B. FOOD CONSUMPTION

For pollutants for which there are no applicable state water quality standards:

1. EPA will calculate the instream concentrations of all pollutants for which EPA has published human health criteria in the current edition of EPA's "Quality Criteria for Water", or National Toxics Standards, as promulgated, or for which EPA has identified human health toxicological

properties in EPA's Integrate Risk Information System (IRIS). These calculations will use an appropriate flow or mixing zone condition.

2. In using these criteria and information, EPA will follow the cancer risk level and fish consumption rate provided by the appropriate state regulatory agency. In the event no policy is provided by the state, EPA policy and/or guidance will be utilized, such as the manual "Assessment and Control of Bioconcentratable Contaminants in Surface Waters".

3. Where these dilution calculations indicate that instream pollutant concentrations may exceed the criteria referenced in paragraphs III.B.1 and III.B.2 above, the facility will be required to monitor for those pollutants. The State will be requested to consider the stream as a "priority waterbody" and to develop state water quality standards and a wasteload allocation where appropriate. NPDES permits may be reopened for point sources that are shown to cause or significantly contribute to these ambient problems, when state water quality standards and wasteload allocations are established.

C. FISH TISSUE INFORMATION

1. If available fish or shellfish tissue information identifies the potential threat to human health at a cancer risk greater than those specified in III.B.2, permittees discharging into the waterbody may be required, by way of a permit requirement or request for information under Section 308 of the Clean Water Act, to analyze their effluents for the subject pollutants and/or identify using a laboratory test the actual bioaccumulation or bioconcentration of the pollutant in fish tissue. The permits for facilities found to be causing or significantly contributing to this problem may be reopened to establish effluent limits based on the appropriate state water quality standards.

2. Enforcement action will be considered under Sections 309 and/or 504 of the Clean Water Act if available fish or shellfish flesh information confirms the existence of an imminent and substantial endangerment to the health or welfare of persons, such as an exceedence of the FDA Action Levels.

IV. CHEMICAL SPECIFIC CONTROLS FOR AQUATIC BIOTA PROTECTION

A. STATE NUMERICAL STANDARDS

Permits written under this strategy will establish effluent limits, if specific chemical water quality standards are or have a reasonable potential to be exceeded, and implement all waste load allocations as specified in the water quality management plan.

B. CHLORINE

Permits for facilities with the potential for a continuous discharge of chlorine will include water quality based effluent limits for Total Residual Chlorine. Water quality based limits will be derived from the state water quality standards giving consideration to appropriate dilution factors, state implementation procedures, or federal criteria if no state standard has been approved.

C. PRETREATMENT

POTWs with approved pretreatment programs controlling indirect discharges of toxic pollutants will be required to develop and adopt technically based local limits (or demonstrate that they are not necessary) which will protect against pass-through, interference and sludge contamination. Additionally POTWs with approved pretreatment programs will be required to monitor the influent, effluent and sludge concentration of toxic and hazardous pollutants, as applicable, in order to evaluate the adequacy of the local limits on an ongoing basis. Some non-pretreatment POTWs with substantial industrial contributions may be required to monitor influent and effluent for toxic pollutants on a case-specific basis.

V. BIOLOGICAL CONTROLS FOR AQUATIC BIOTA PROTECTION

A. Specific state required effluent limits or monitoring for whole effluent toxicity will be imposed as required by the state water quality standards and implementation plan.

B. Where ambient toxicity is identified as a result of a facility discharge, the Region will proceed with permit effluent limits to regulate controllable pollutants.

1. Effluent limits will be established using available state water quality standards and implementation procedures.

2. "Toxicity Reduction Evaluations" may be initially required to identify the source(s) of the toxicity and determine how the toxicity can be reduced as a part of a schedule leading to compliance with effluent limits.

C. Permits issued to dischargers with a potential for causing ambient toxicity will require that the permittee perform periodic toxicity screening using whole effluent biomonitoring techniques.

1. Permittees will typically be required to monitor for the duration of the permit. The monitoring frequency will be based on toxicity potential and effluent variability.

2. State mixing zone procedures will determine the applicability of acute or chronic test methods.

3. Discharge samples used for biomonitoring analysis will consist of flow weighted composite samples of all dry weather flows discharged into overlapping mixing zones within a receiving stream. Stormwater flows may be considered if a significant threat of contamination exists. If a facility discharges (or may discharge) into two or more receiving streams, testing will be required for each stream.

4. Required biomonitoring will be performed in accordance with methods published in references 2, 3, and 4 in the attached bibliography. The permit will require a dilution series necessary to calculate the NOEL. One dilution will be reflective of the critical low flow dilution.

5. Tests on more than one species will be required. Some combination of the following test methods or methods specified in approved state water quality standards will be required for biomonitoring:

   *Freshwater receiving streams (salinity <2000 ppm)
   -- 48 hour Daphnia acute survival
   -- 48 hour Fathead Minnow acute survival
   -- 7 day Ceriodaphnia chronic survival/reproduction
   -- 7 day Fathead Minnow chronic survival/growth

   *Saline receiving streams (salinity >2000 ppm)
   -- 48 hour Mysid acute survival
   -- 48 hour Silverside Minnow acute survival
   -- 7 day Mysid chronic survival/growth
   -- 7 day Silverside Minnow chronic survival/growth

6. Dilution water used in the biomonitoring test will be receiving stream water collected at a point upstream of the discharge point(s) or other stream water if approved by the permitting authority. Synthetic laboratory water will be used if the upstream water is shown to already be toxic or if there is no acceptable natural water.

D. When the biomonitoring data shows actual or potential toxicity after dilution with the receiving stream, permittees will be required to retest their effluent to determine if toxicity is consistent or occurs on a periodic basis. If effluent toxicity is persistent, whole effluent toxicity limits and/or a TRE requirement will be applied, as appropriate.

VI. BIBLIOGRAPHY

1. "Quality Criteria for Water 1986," EPA 440/5-86-001, United States Environmental Protection Agency, May 1, 1986.

2. "Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organisms," EPA 600/4-90/027, U.S. Environmental Protection Agency, September, 1991.

3. "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA 600/4-89/001, U.S. Environmental Protection Agency, February 1989.

4. "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms", EPA 600/4-87/028, U.S. Environmental Protection Agency, May 1988.

5. "Technical Support Document for Water Quality-based Toxics Control," EPA/505/2-90-001, PB91-127415, U.S. Environmental Protection Agency, March 1991.

6. "Permit Writer's Guide to Water Quality-based Permitting for Toxic Pollutants," EPA 440/4-87-005, U.S. Environmental Protection Agency, 1987.

7. National Policy for Development of Water Quality-based Permit Limitations for Toxic Pollutants, 49 Federal Register 9016, March 9, 1984.

8. "Methods for Aquatic Toxicity Identification Evaluations, Phase I: Toxicity Characterization Procedures", EPA 600/6-91/003, U.S. Environmental Protection Agency, February, 1991.

9. "Methods for Aquatic Toxicity Identification Evaluations, Phase II: Toxicity Identification Procedures", EPA 600/3-88/035, U.S. Environmental Protection Agency, February 1989.

10. "Methods for Aquatic Toxicity Identification Evaluations, Phase III: Toxicity Confirmation Procedures", EPA 600/3-88/036, U.S. Environmental Protection Agency, February 1989.

11. "Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs)", EPA 600/2-88/070, U.S. Environmental Protection Agenc; March 1989.

12. "Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants", EPA 600/2-88/062, U.S. Environmental Protection Agency, April 1989.

13. "Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I", EPA-600/6-91/005, U.S. Environmental Protection Agency, June, 1991.

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

NOV 25 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William Hathaway, Director
Water Quality Protection Division (6WQ)
U. S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Dear Mr. Hathaway:

Subject: NPDES Permit No. NM0028355, Deletion of Outfalls

Please delete the following two outfalls from Los Alamos National Laboratory's NPDES Permit, dated August 1, 1994. Personnel from the New Mexico Environment Department (NMED), DOE Oversight Bureau, have been onsite and have verified that these outfalls are no longer in use.

NPDES Outfall	Industrial Facility	Waste Stream
03A40[1]	TA-43-1	Treated Cooling Water
06A106	TA-36-1	Photo Rinsewater

[1] Outfall becomes "storm water only"

Please contact Tina Marie Sandoval (505-665-2288) or Mike Saladen (505-665-6085) of the Laboratory's Water Quality and Hydrology Group (ESH-18) if you have any questions regarding this request for deletion of outfalls.

Sincerely,

David A. Gurulé

David A. Gurulé
Area Manager

LAAME:6BK-015

cc:
See page 2

Los Alamos National Laboratory

Environment, Safety, and Health Division
P.O. Box 1663, Mail Stop K491
Los Alamos, New Mexico 87545
(505) 667-4218 / FAX: (505) 665-3811

Date: October 26, 1999
Refer to: ESH-DO:99-209

Mr. William Hathaway, Director
Water Quality Protection Division (6WQ)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NPDES PERMIT NO. NM0028355, CANCELLATION OF PERMIT APPLICATIONS FOR CATEGORY 04A OUTFALLS

Dear Mr. Hathaway:

In accordance with the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) regulations 40 CFR 122.21, the University of California (UC) and the U.S. Department of Energy (DOE), Los Alamos Area Office, submitted permit applications for the renewal of the Los Alamos National Laboratory's NPDES Permit No. NM0028355 on May 4, 1998. Included in the submittal were Form 2C's and Form 2D's for fourteen (14) existing and twelve (12) new Category 04A outfalls. These outfalls are associated with the Los Alamos water supply wells and discharge water from well flushing and testing, and from bearing cooling systems.

On October 13, 1998, the Laboratory received notification from the EPA that the existing NPDES Category 04A outfalls had been eliminated from the Laboratory's NPDES Permit and that the associated wells would be covered under Los Alamos County's NPDES Application No. NM0030431. Based on this recent action, the Laboratory requests that EPA cancel the Form 2C and 2D applications previously submitted by the UC and DOE for the following Category 04A outfalls.

Form 2C's	*Form 2D's*
1. 04A118	1. 04A187
2. 04A161	2. 04A188
3. 04A163	3. 04A189
4. 04A164	4. 04A190
5. 04A165	5. 04A191
6. 04A166	6. 04A192
7. 04A171	7. 04A193
8. 04A172	8. 04A194
9. 04A173	9. 04A195
10. 04A174	10. 04A196
11. 04A175	11. 04A197
12. 04A176	12. 04A198
13. 04A177	
14. 04A186	

If you have questions or require additional information, please call Mike Saladen (505-665-6085) or Tina Marie Sandoval at (505-665-2288) of the Laboratory's Water Quality and Hydrology Group (ESH-18). Thank you for your assistance in this matter.

Sincerely,

Dennis J. Erickson
Division Director
Environment, Safety, and Health Division

NOV 17 999

DJE:TMS/rm

Cy: Jack Ferguson, EPA, Region 6, Dallas, Texas
Wilma Turner, EPA, Region 6, Dallas, Texas
Scott Wilson, EPA, Region 6, Dallas, Texas
Everett Spencer, EPA, Region 6, Dallas, Texas
Diana McDonald, EPA, Region 6, Dallas, Texas
Jim Davis, NMED/SWQB, Santa Fe, New Mexico
Barbara Hoditscheck, NMED/SWQB, Santa Fe, New Mexico
Joe Vozella, AAMME LAAO, MS A316
Robert Enz, LAAME LAAO, MS A316
Tom Gunderson, DLD-OPS, LANL, MS A100
Deborah Woitte, LC-GL, LANL, MS A187
Steven Rae, (ESH-18/WQ&H:99-0424) ESH-18, MS K497
Mike Saladen, ESH-18, LANL, MS K497
Tina Sandoval, ESH-18, LANL, MS K497
Marc Bailey, ESH-18, LANL, MS K497
Harvey Decker, ESH-18, LANL, MS K497
Carla Jacquez, ESH-18, LANL, MS K497
Tim Glasco, Los Alamos County, Los Alamos, N.M.
CIC-10, MS A150
ESH-DO File, MS K491
WQ&H File, MS K497

EXHIBIT

tabbles

DD

To: Chen.Isaac@epamail.epa.gov
From: Marc Bailey <marc@lanl.gov>
Subject: Fwd: Comments on EPA Preliminary Draft NPDES Permit No. NM0028355
Cc: steven Rae <stevenrae@lanl.gov>, saladen@lanl.gov, jacquezc@lanl.gov, beth Gray <bethg@lanl.gov>, "Gene E. Turner" <gturner@doeal.gov>, wardwell@lanl.gov, sandovalt@lanl.gov, bret_lucas@nmenv.state.nm.us
Bcc: marc Bailey <marc@lanl.gov>
Attached: c:\docume~1\082445\applic~1\qualcomm\eudora\attach\Draft permit February 200522.doc;c:\docume~1\082445\applic~1\qualcomm\eudora\attach\Attachment 2 pH summary 2004 permt reapp.xls;c:\docume~1\082445\applic~1\qualcomm\eudora\attach\TA 3 Power Plant Environmental System Flow Diagram Outfall 001 Attachment 1.doc;

Mr. Chen-

Attached are the Laboratory's comments on EPA's Preliminary Draft NPDES Permit No. NM0028355 along with two supporting documents Comments were made directly on the Draft you provided using "track changes". Detailed Comments can be found at the end of the Draft beginning on page 5 of Part II.

Please contact me if you have any questions.

Thank you again for the extension.

Marc Bailey

Marc Bailey (marc@lanl.gov)
ENV - Water Quality and Hydrology
Regulatory Compliance and Line Services Team
665-8135 699-4926 (cell)
MS K497

Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733 NPDES Permit No. **NM0028355**

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended,
(33 U.S.C. 1251 et. seq; the "Act"),

University of California
Management Contractor for Operations
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

and

U.S. Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

are authorized to discharge from a facility located at Los Alamos,

to receiving waters named: Mortandad Canyon, Canada del Buey, Los Alamos Canyon, Sandia Canyon, Ten Site Canyon, Canon de Valle, and Water Canyon, which are unclassified tributaries to the Rio Grande in Waterbody Segment Code No. 20.6.4.114, of the Rio Grande Basin,

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Parts I [Requirements for NPDES Permits - 15 pages], II [Other Conditions - 4 pages], III [Standard Conditions for NPDES Permits - 8 pages], and IV [Sewage Sludge Requirements - 18 pages] hereof.

This permit supersedes and replaces NPDES Permit No. NM0028355 issued December 29, 2000.

This permit shall become effective on

This permit and the authorization to discharge shall expire at midnight, (5 years from issuance)

Issued on

Prepared by

Miguel I. Flores
Director
Water Quality Protection Division (6WQ)

Isaac Chen
Environmental Engineer
NPDES Permits Branch (6WQ-P)

PART I - REQUIREMENTS FOR NPDES PERMITS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL 001
Discharge Type: Continuous
Latitude 35°52'26"N, Longitude 106°19'089"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge Power Plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, R/O reject. floor and sink drains, and treated sanitary re-use to Sandia Canyon, an unclassified tributary of the Rio Grande, in Segment Number 20.6.4.114 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
TSS STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	11 ug/l	11 ug/l
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	Continuous	Totalizer Record
TSS STORET: 00530	1/Month	24-hr Composite
Total Residual Chlorine STORET: 50060	1/Month	Grab
pH (Standard Units) STORET: 00400	1/~~Day~~Month	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge from Outfall 001 (Latitude 35°52'26"N, Longitude 106°19'09"W).

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM
There shall be no discharge of floating solids or visible foam in other than trace amounts.

PCBs
There shall be no discharge of PCB compounds such as those commonly used for transformer fluid. (*1)

FOOTNOTES

*1 If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

INTERNAL OUTFALL 001A**(Recommend Deletion, See Detailed Comments (1))**
Discharge Type: ~~Continuous~~Intermittent

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge Power Plant waste water from boiler blowdown drains, demineralizer backwash, R/O reject, and any low volume waste (sinks and floor drains) to Outfall 001.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
TSS STORET: 00530	****	****	30	100
Oil and Grease (*1) STORET: 00556(*1)	****	****	15	20
Total Copper (*1) STORET: 01042	****	****	1.02	1.02
Total Iron (*1) STORET: 01045	****	****	~~1.0~~10	~~1.0~~40

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	1/~~Day~~Month	Estimate
TSS STORET: 00530	1/Month	~~24 hr Composite~~grab
Oil and Grease STORET: 00556	1/Month	~~24 hr Composite~~grab
Total Copper STORET: 01042	1/Month	~~24 hr Composite~~grab
Total Iron STORET: 01045	1/Month	~~24 hr Composite~~grab

SAMPLING LOCATION(S) (Recommend deletion of internal outfalls, see Detailed Comments 1)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at a point after the Secondary Environmental Tank prior to commingling with other effluents.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

INTERNAL OUTFALL 001B **(No Discharge, Recommend Deletion, See Detailed Comments (1))**
Discharge Type: Intermittent ~~or Continuous~~

~~During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),~~

~~the permittee is authorized to discharge Combusting Gas Turbine Generator (CGTG) oily waste to Outfall 001.~~

~~Such discharges shall be limited and monitored by the permittee as specified below:~~

~~PARAMETERS/STORET CODES~~	~~DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS~~			
	~~QUANTITY/LOADING~~		~~QUALITY/CONCENTRATION~~	
	~~(LBS/DAY UNLESS STATED)~~		~~(mg/L UNLESS STATED)~~	
	~~MONTHLY AVG~~	~~DAILY MAX~~	~~MONTHLY AVG~~	~~DAILY MAX~~
~~Flow STORET: 50050~~	~~Report MGD~~	~~Report MGD~~	~~****~~	~~****~~
~~TSS STORET: 00530~~	~~****~~	~~****~~	~~30~~	~~100~~
~~Oil and Grease STORET: 00556~~	~~****~~	~~****~~	~~15~~	~~20~~

~~PARAMETERS/STORET CODES~~	~~MONITORING REQUIREMENTS~~	
	~~FREQUENCY OF ANALYSIS~~	~~SAMPLE TYPE~~
~~Flow STORET: 50050~~	~~1/Day~~	~~Estimate~~
~~TSS STORET: 00530~~	~~1/Year~~	~~Grab~~
~~Oil and Grease STORET: 00556~~	~~1/Year~~	~~Grab~~

~~SAMPLING LOCATION(S)~~
~~Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at a point after the CGTG prior to commingling with other effluents.~~

~~NO DISCHARGE REPORTING~~
~~If there is no discharge~~ event at this outfall during the samp~~ling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.~~

~~FLOW MEASUREMENTS~~
~~"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering~~

~~judgment.~~

FOOTNOTES

*1 If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements. **Recommend listing MQLs for each parameter listed in the permit for clarification. See Page 1, Part II, Paragraph A.**

OUTFALL 13S

Discharge Type: Continuous
Latitude 35°51'08"N, Longitude 106°16'33"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon or Canada del Buey, unclassified tributaries of the Rio Grande, in Segment Number 20.6.4.114 of the Rio Grande Basin and to outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A.

Such discharges shall be limited and monitored by the permittee as specified below:

=

CHEMICAL/PHYSICAL/BIOCHEMICAL

=

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
BOD5 (*1) STORET: 00310	75/80	112/119	30	45
TSS (*1) STORET: 00530	75/80	112/119	30	45
Fecal Coliform Bacteria (*2) STORET: 74055	****	****	500 (#/100ml)	500 (#/100ml)
Total Residual Chlorine (*3) STORET: 50060	****	****	11 ug/l	11 ug/l
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	Continuous	Totalizer Record
BOD5 STORET: 00310	1/Month	24-Hr Composite
TSS STORET: 00530	1/Month	24-Hr Composite
Fecal Coliform Bacteria STORET: 74055	1/Month	Grab
Total Residual Chlorine STORET: 50060	1/Month	Grab
pH (Standard Units) STORET: 00400	1/~~Day~~Month	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at the Parshall Flume following the chlorine contact chamber (Latitude 35°51'08"N, Longitude 106°16'33"W) and prior to discharge to either Canada del Buey at Latitude 35°51'07"N, Longitude 106°16'27"W, or into the effluent reuse line to Sandia Canyon at Latitude 35°52'29"N, Longitude 106°18'38"W, or other outfalls utilizing treated effluent in the Outfall 001 and Category 03A

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM

There shall be no discharge of floating solids or visible foam in other than trace amounts.

FOOTNOTES

*1 Mass loads of 75 and 112 lbs/day apply from the beginning of the effective date of the permit and lasting until the average discharge rate has increased to 0.318 MGD through the addition of sanitary waste water from a residential subdivision located in Los Alamos County. LANL shall notify EPA Region 6 and NMED in writing two weeks prior to the addition of residential sanitary waste water to the TA-46 treatment plant. Mass loads of 80 and 119 lbs/day apply beginning the connection of sanitary waste water from a residential suhdivision located in Los Alamos County lasting through the expiration date of the permit.

*2 Logarithmic mean.

*3 Effluent limitations and monitoring requirements only apply when discharge is made to Canada del Buey. If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

OUTFALL 051 - Radioactive Liquid Waste Treatment Facility (TA-50)
Discharge Type: Intermittent
Latitude 35°51'54"N, Longitude 106°17'52"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated radioactive liquid waste to Mortandad Canyon, an unclassified tributary to the Rio Grande, in segment number 20.6.4.114 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report	Report	****	****
Chemical Oxygen Demand STORET: 00340	****	****	125	125
Total Suspended Solids STORET: 00530	****	****	30	45
Total Toxic Organics (*1) STORET: 78141	****	****	1.0	1.0
Tritium (*2) STORET: 82136	****	****	Report	Report
Total Alpha STORET: 01501	****	****	Report	Report
Ra 226+228 STORET: 11503	****	****	Report	Report
Total Residual Chlorine (*3) STORET: 50060	****	****	11 ug/l	11 ug/l
~~4,4'-DDT and derivatives (*3)~~ ~~STORET: 39300~~	~~****~~	~~****~~	~~0.001 ug/l~~	~~0.001 ug/l~~
Perchlorate (*3) STORET: 61209	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	~~1/Day~~Continuous	Record

Chemical Oxygen Demand STORET: 00340	1/Month	Grab
Total Suspended Solids STORET: 00530	1/Month	Grab
Total Toxic Organics STORET: 78141	1/Month	Grab
Tritium (*2) STORET: 82136	1/Year	Grab
Total Alpha STORET: 01501	1/Year	Grab
Ra 226+228 STORET: 11503	1/Year	Grab
Total Residual Chlorine STORET: 50060	1/Month	Grab
~~4,4' DDT~~ ~~STORET: 39300~~	~~1/Month~~	~~Grab~~
Perchlorate STORET: 61209	1/Year	Grab
pH (Standard Units) STORET: 00400	1/~~Day~~Month	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following the final treatment and prior to or at the point of discharge from TA-50-1 treatment plant (Latitude 35°51'5~~8.3~~4"N, Longitude 106°17'4~~8.5~~52"W)

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM

There shall be no discharge of floating solids or visible foam in other than trace amounts.

FLOW MEASUREMENTS

"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 When accelerator produced.

*3 If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

OUTFALL 05A055 - High Explosives Waste Water Treatment Plant (TA-16-1508)
Discharge Type: Intermittent
Latitude 35°50'49"N, Longitude 106°19'51"W

During the period beginning the effective date of the permit and lasting through tbe expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated waste water from the high explosives waste water treatment facility to a tributary to Canon de Valle, an unclassified tributary of the Rio Grande, in segment number 20.6.4.114 of the Rio Grande Basin

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Chemical Oxygen Demand STORET: 00340	****	****	125	125
Total Suspended Solids STORET: 00530	****	****	30	45
Oil and Grease STORET: 00556	****	****	15	15
Total Toxic Organics (*1) STORET: 78141	****	****	1.0	1.0
Trinitrotoluene STORET: 81360	****	****	0.02	Report
Total RDX STORET: 81364	****	****	200 ug/l	660 ug/l
Perchlorate STORET: 61209	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	1/~~Day~~Month	Estimate
Chemical Oxygen Demand STORET: 00340	1/Quarter	Grab

Total Suspended Solids STORET: 00530	1/Quarter	Grab
Oil and Grease STORET: 00556	1/Quarter	Grab
Total Toxic Organics STORET: 78141	1/Quarter	Grab
Trinitrotoluene STORET: 81360	1/Quarter	Grab
Total RDX STORET: 81364	2/Month	Grab
Perchlorate STORET: 61209	1/Year	Grab
pH (Standard Units) STORET: 00400	1/~~Day~~Month	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge (Latitude 35°50'49"N, Longitude 106°19'51"W).

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the ~~preprinted~~ EPA approved , Laboratory computer generated Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM

There shall be no discharge of floating solids or visible foam in other than trace amounts.

FLOW MEASUREMENTS

"Estimate" flow measurements shall not be subject to the accuracy provisions established ~~at~~ in Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

OUTFALLS 03A

Discharge Type: Intermittent

Outfall 03A021: Latitude 35°52'14"N, Longitude 106°19'1~~2~~1"W (TA3-29)

Outfall 03A022: Latitude 35°52'14"N, Longitude 106°19'01"W (TA3-~~66~~2274)

03A027: Latitude 35°52'26"N, Longitude 106°19'08"W (TA3-285 & 2327)

03A028: Latitude 35°49'58"N, Longitude 106°17'47"W (TA-15-185 & 202)

03A048: Latitude 35°52'11"N, Longitude 106°15'45"W (TA-53-~~964~~ 963 & ~~979~~978)

Outfall 03A113: Latitude 35°52'03"N, Longitude 106°15'43"W (TA-53-293, 294, 952, 1032, & 1038)

Outfall 03A130: Latitude 35°50'19"N, Longitude 106°19'33"W (TA11-30)

Outfall 03A158: Latitude 35°52'30"N, Longitude 106°16'18"W (TA21-209)

Outfall 03A160: Latitude 35°51'47"N, Longitude 106°17'49"W (TA35-124)

Outfall 03A181: Latitude 35°51'~~54~~50.8"N, Longitude 106°18'05"W (TA55-6)

Outfall 03A185: Latitude 35°50'00"N, Longitude 106°18'40"W (TA15-625 & 626)

Outfall 03A199: Latitude 35°52'33"N, Longitude 106°19'19"W (TA3-1837)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Mortandad Canyon (Outfall 03A021, 022, and 181), Sandia Canyon (Outfalls 03A027, 113, and 199), Water Canyon (Outfall 03A028, 130, and 185), and Los Alamos Canyon (Outfall 03A048 and 158), and Ten Site Canyon (Outfalls 03A160), unclassified tributaries to the Rio Grande, in segment number 20.6.4.114 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids	****	****	30	100

STORET: 00530				
Total Residual Chlorine (*1)	****	****	11 ug/l	11 ug/l
STORET: 50060				
Total Phosphorus (*1)	****	****	20	40
STORET:00665				
Total Copper (*1)	****	****	1.02	1.02
STORET: 01042				
Total Selenium (*1)	****	****	5.0 ug/l	5.0 ug/l
STORET: 01147				
~~Total Cyanide (*1)~~	~~****~~	~~****~~	~~5.2 ug/l~~	~~5.2 ug/l~~
STORET: 00720				
Tritium (*2)	****	****	Report	Report
STORET: 82136				
~~4,4' DDT and derivatives (*1)~~	~~****~~	~~****~~	~~0.001 ug/l~~	~~0.001 ug/l~~
~~STORET: 39300~~				
pH (Standard Units)	Ranges from 6.0 to 9.0			
STORET: 00400				

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/~~Day~~Month	Estimate
STORET: 50050		
Total Suspended Solids	1/Month	Grab
STORET: 00530		
Total Residual Chlorine (*3)	1/Month (1/Year)	Grab
STORET: 50060		
Total Phosphorous	1/Quarter	Grab
STORET: 00665		
Total Copper	1/Year	Grab
STORET: 01042		
Total Selenium ~~(*3)~~	~~1/Month (~~1/Year)	Grab
STORET: 01147		
~~Total Cyanide (*3)~~	~~1/Month (1/Year)~~	~~Grab~~
~~STORET: 00720~~		
Tritium (*2)	1/Year	Grab
STORET: 82136		
~~4,4' DDT and derivatives (*3)~~	~~1/Month (1/Year)~~	~~Grab~~
~~STORET: 39300~~		
pH (Standard Units)	1/~~Day~~Month	Grab
STORET: 00400		

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM
There shall be no discharge of floating solids or visible foam in other than trace amounts.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II.A of this permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

*2 When accelerator produced.

*3 Monitoring frequency of 1/Month applies to the following specific outfalls only:
~~TRC - 03A021 and 03A027~~
~~**Selenium - 03A027**~~ **See Detailed Comments (5) and (9)**
~~4,4'-DDT+DDD+DDE - 03A130~~
~~Cyanide - 03A130 and 03A185~~
Monitoring frequency of 1/year applies to the rest of outfalls not listed above.

OUTFALL 02A129 (TA-21-357)
Discharge Type: Intermittent
Latitude 35°52'3~~1~~2"N, Longitude 106°16'~~29~~31"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge boiler blowdown, water softener waste water, and once through cooling water to Los Alamos Canyon, an unclassified tributary of the Rio Grande, in segment number 20.6.4.114 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow (MGD) STORET: 50050	Report	Report	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Iron STORET: 10145	****	****	10	40
Total Phosphorus STORET: 00665	****	****	20	40
Sulfite (as SO_3) STORET: 00740	****	****	35	70
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow STORET: 50050	1/~~Day~~Quarter	Estimate
Total Suspended Solids STORET: 00530	1/Quarter	Grab
Total Iron STORET: 10145	1/Quarter	Grab
Total Phosphor~~e~~us STORET: 00665	1/Quarter	Grab
Sulfite (as SO_3) STORET: 00740	1/Quarter	Grab

pH (Standard Units) STORET: 00400	1/~~Day~~Quarter	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Following final treatment and prior to or at the discharge point (Latitude 35°52'32"N, Longitude 106°16'31"W)

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS OR VISIBLE FOAM
There shall be no discharge of floating solids or visible foam in other than trace amounts.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

B. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

NONE

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

C. REPORTING OF MONITORING RESULTS (MAJOR DISCHARGERS)

Monitoring information shall be on Discharge Monitoring Report Form(s) EPA 3320-1 (EPA approved, Laboratory computer generated) as specified in Part III.D.4 of this permit and shall be submitted monthly, quarterly, or yearly as specified in the monitoring requirements for each outfall in Part I.

1. Reporting periods shall end on the last day of the month.

2. The permittee is required to submit regular monthly reports as described above postmarked no later than the 28th day of the month following each reporting period.

PART II - OTHER CONDITIONS

A. MINIMUM QUANTIFICATION LEVEL (MQL)

If any individual analytical test result is less than the minimum quantification level listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

	MQL (μg/L)
Copper (Total)	10
Selenium (Total)	5
Residual Chorine (Total)	100
4,4' DDT	.1
perchlorates	Report
TNT	?
RDX	?
Iron (Total)	?
Phosphorus (Total)	?
COD	?
Request MQL for all permitted parameters	

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40CFR136. For any pollutant for which the permittee determines an effluent specific MDL, the permittee shall send to the EPA Region 6 NPDES Permits Branch (6WQ-P) a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that the effluent specific MDL was correctly calculated. An effluent specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

$$MQL = 3.3 \times MDL$$

Upon written approval by the EPA Region 6 NPDES Permits Branch (6WQ-P), the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) calculations and reporting requirements.

B. 24-HOUR ORAL REPORTING: DAILY MAXIMUM LIMITATION VIOLATIONS

Under the provisions of Part III.D.7.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to EPA Region 6, Compliance and Assurance Division, Water Enforcement Branch (6EN-W), Dallas, Texas and NMED, within 24 hours from the time the permittee becomes aware of the violation followed by a written report in five days.

Copper, Selenium, ~~Tritium, Cyanide,~~ TRC~~, and 4,4' DDT~~.

C. COMPOSITE SAMPLING (24-HOUR)

1. STANDARD PROVISIONS

Unless otherwise specified in this permit, the term "24-hour composite sample" means a sample consisting of a minimum of three (3) aliquots of effluent collected at regular intervals over a normal 24-hour operating period and combined in proportion to flow or a sample continuously collected in proportion to flow over a normal 24-hour operating period.

2. VOLATILE COMPOUNDS

For the "24-hour composite" sampling of volatile compounds using EPA Methods 601, 602, 603, 624, 1624, or any other 40CFR136 method approved after the effective date of the permit, the permittee shall manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. These aliquots must be combined in the laboratory to represent the composite sample of the discharge. One of the following alternative methods shall be used to composite these aliquots.

a. Each aliquot is poured into a syringe. The plunger is added, and the volume in the syringe is adjusted to 1-1/4 ml. Each aliquot (1-1/4 ml.) is injected into the purging chamber of the purge and trap system. After four (4) injections (total 5 ml.), the chamber is purged. Only one analysis or run is required since the aliquots are combined prior to analysis.

b. Chill the four (4) aliquots to 4 Degrees Centigrade. These aliquots must be of equal volume. Carefully pour the contents of each of the four aliquots into a 250-500 ml. flask which is chilled in a wet ice bath. Stir the mixture gently with a clean glass rod while in the ice bath. Carefully fill two (2) or more clean 40 ml. zero head-space vials from the flask and dispose of the remainder of the mixture. Analyze one of the aliquots to determine the concentration of the composite sample. The remaining aliquot(s) are replicate composite samples that can be analyzed if desired or necessary.

c. Alternative sample compositing methods may be used following written approval by EPA Region 6.

The individual samples resulting from application of these compositing methods shall be analyzed following the procedures specified for the selected test method. The resulting analysis shall be reported as the daily composite concentration.

As an option to the above compositing methods, the permittee may manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. A separate analysis shall be conducted for each discrete grab sample following the approved test methods. The determination of daily composite concentration shall be the arithmetic average (weighted by flow) of all grab samples collected during the 24-hour sampling period.

~~G.~~D. TRITIUM

The permittee shall provide sufficient information to demonstrate the tritium sources if it intents to claim that tritium detected in the effluent is reactor-produced, but not accelerator-produced.

E. CYANIDE EFFLUENT TEST PROCEDURES

To comply with the sampling and analysis requirements for total cyanide and cyanide amenable to chlorination, the permittee shall use an approved test procedure at 40CFR136. If the analysis of cyanide amenable to chlorination is subject to matrix interferences, the weak acid dissociable cyanide method (Method 4500 CN I - Standard Methods, latest edition approved in 40CFR136) may be substituted for this parameter. The permittee may use ion chromatographic separation - amperometric detection (IC method) as a substitute for the colorimetric detection steps in any of the above cyanide methods. No other modifications of the above methods are authorized by this provision unless such modifications are approved in writing by the permitting authority.

F. OIL AND GREASE ALTERNATIVE TEST PROCEDURE: INTERIM LIMITED USE APPROVAL

Method 1664 may be used as an oil and grease alternative test procedure for NPDES permit compliance monitoring purposes. This approval includes all of the analytical options within Method 1664 provided that the equivalency demonstration is performed and all performance specifications are met at each outfall.

G. CO-PERMITTEES

The University of California (UC) and the U.S. Department of Energy (DOE) are co-permittees for the Los Alamos National Laboratory (LANL) NPDES permit. EPA may take enforcement actions as appropriate against either UC or DOE or both.

H. NONCOMPLIANCE SAMPLING

Upon receipt of analytical results, any limited parameter found to be out of compliance with this permit shall be resampled for that noncompliant parameter within seven (7) days. This resampling schedule for noncompliant effluent limits shall be repeated until analytical results indicate the limited parameter is in compliance with this permit.

I. REOPENER CLAUSE

This permit may be reopened and modified or revoked and reissued to reflect any applicable changes to the New Mexico Water Quality Standards. In accordance with 40 CFR 122.44(d), the permit may be reopened and modified during the life of the permit if relevant portions of The State of New Mexico Standards for Interstate and Intrastate Surface Waters are revised, or new Standards are established and/or remanded by the New Mexico Water Quality Control Commission. In addition, the permit may be reopened and modified during the life of the permit, if the procedures implementing the State of New Mexico Standards for Interstate and Intrastate Surface Waters are either revised or promulgated by the New Mexico Environment Department.

In accordance with 40 CFR 122.62(s)(2), the permit may be reopened and modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit reissuance. Permit modifications shall reflect the results of any of these actions and shall follow regulations listed at 40 CFR 124.5.

~~S.~~J. TEST METHODS

The following methods may be used for analysis under this permit:

Liquid Scintillation Counting: EPA Method ANC335, R-1

Gamma Spectroscopy: EPA Methods 904.0 and 903.1

Nitroaromatics and Nitramines by High Performance Liquids Chromatography: SW846 Method 8330

Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry: EPA Method 200.7

Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-~~Atomic Emission~~Mass Spectrometry: EPA Method 200.8 ICP-MS (using hydride generation prep)

Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry: EPA Method 200.9

Determination of Inorganic Anions by Ion Chromatography: EPA Method 300.0

Microwave Digestion: SW846 Method 3015

Hot Plate Digestion: EPA Method 200.2

DETAILED COMMENTS:

(1) Internal Outfalls (NPDES Outfalls 001A and 001B):

The Laboratory's primary recommendation is that EPA delete the requirements for internal outfalls 001A and 001B. Although the Laboratory's TA-3 Power Plant generates electricity for LANL facility use, the Laboratory does not meet the criteria for a facility that requires pretreatment under the federal CWA and does not meet 40 CFR 423.10 Applicability requirements. 40 CFR Part 423.10 states, in part: "***The provisions of this part are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sales (emphasis added)*** *which results primarily from a process utilizing fossil-type fuel...in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.*"

Additionally, there will be no discharge from the Combust. Gas Turbine Generation (CGTG) unit into NPDES Outfall 001. The de minimus waste stream from the CGTG will be containerized and disposed of according to Laboratory procedures and not discharged to the outfall. Therefore, outfall 001B does not exist. A revised flow schematic is provided as Attachment 1. Total Iron limits should be consistent with NPDES Outfall 02A129 (TA-21 Steam Plant).

If EPA agrees to delete the internal outfalls, EPA may want to add the additional requirements (i.e. Total Iron, Total Copper, Oil & Grease) from the internal outfall to Outfall 001, if these are still pollutants of concern to NMED and EPA. The Laboratory's data summary does not indicate an impact to the environment from these parameters at Outfall 001. The Laboratory recommends that EPA delete the requirements for internal outfalls (001A and 001B).

(2) pH Monitoring:

The Laboratory recommends that EPA reduce the frequency of monitoring for pH at all outfalls. Currently, the draft permit requires pH analyses at all outfalls at a frequency of once per day. The pH requirements in the draft permit are not consistent with the draft Fact Sheet. The Laboratory's existing permit requires pH monitoring at the following frequencies: (1) NPDES Outfall 001=1/month; (2) NPDES Outfall 13S=1/week; NPDES Outfall 051=1/week; (4) NPDES Outfall 05A055 1/quarter; (5) 03A Cooling Towers=1/quarter; and, (6) NPDES Outfall 02A129=1/quarter. The pH data provided in the NPDES Permit Re-Application (August 2004) consisted of the maximum and minimum pH values recorded over the past 6 years at each outfall. Attached is a new spreadsheet showing the maximum, minimum, and long term average for each outfall from 1/1/98 through 12/31/2003 (Attachment 2). During this time period there were 3 exceedances of the maximum pH limit out of 863 samples collected. Corrective actions were taken to mitigate recurrence. As a result, there has not been a pH exceedance since December 17, 2002. Based on BPJ and the long term averages and the compliance record for pH monitoring, the Laboratory feels the frequency of pH analysis should be no more frequent than for other parameters listed for each outfall category. Recommended sample frequencies are noted using "Tracked Changes". These recommended pH monitoring frequencies are more stringent than existing permit requirements and this allows pH to be collected at the same time as other parameters are collected at the outfall. Please note, it would take one Laboratory person an entire day to collect pH samples at all the outfalls because of the distribution of outfalls over 40 square miles, intermittent flows, and security access ~~issues~~requirements.

(3) 4,4'-DDT and Derivatives:

The Laboratory requests deletion of monitoring and reporting requirements at NPDES Outfalls 051, 03A130 and 03A158 for 4'4'-DDT and Derivatives due to laboratory error in analysis/reporting. 4,4'-DDT (DDT) was documented in error as "present" in the Laboratory's NPDES Permit Re-Application (Form 2C) for outfalls 03A130, 03A158, and 051. The Laboratory did not expect any "detections" for DDT at any outfall since LANL does not use this pesticide (DDT has been banned for many years). On Form 2C, the "BELIEVED PRESENT" box was automatically checked when the analytical result showed a result based on the application software setup. However, we have since learned that the analytical laboratory had problems with pesticide results in the summer of 2004, and in fact they had DDT and DDE laboratory cross contamination from high-level waste samples. There were 20 samples that were affected by this cross contamination including the samples for the three outfalls listed above. The analytical laboratory has indicated that these results should be qualified "R" (rejected). We have re-sampled Outfall 051 for DDT and the result was non-detect. The remaining two outfalls will be re-sampled ASAP and LANL will submit the results to EPA as soon as they are received. Based on this information, the Laboratory feels that DDT is not a contaminant of concern at the NPDES outfalls, and should not be included in the new permit. Analytical documentation of the cross contamination is available, upon request. Please delete DDT requirements from outfalls 051, 03A130, 03A158 and other category 03A outfalls.

(4) Cyanide:

The total cyanide (CN) results provided on Form 2C of the NPDES Permit Re-Application for NPDES Outfalls 03A027, 03A048, 03A113, 03A130, and 03A185 should have been qualified as "J" (estimated value) for these outfalls, except 03A185. In addition, the CN result for each of these five outfalls was less than the MQL of 10 ug/L and should have been reported as zero on the application. The Laboratory is investigating a possible interference in the sample matrix using Method 335.3. The Laboratory has re-sampled these outfalls for CN and will analyze the samples using Method 4500 CN I, Standard Methods 18th edition.

Analytical results will be forwarded to EPA upon receipt. Based on the fact that the CN results were below the MQL, subject to matrix interference, and "J" flagged, the Laboratory requests that the CN requirement be deleted from the draft permit.

(5) Selenium:

The Laboratory requests that total selenium reporting requirements for specified outfalls be reduced from 1/month to 1/year. Wastewater effluent samples taken at Los Alamos National Laboratory are routinely analyzed for selenium (see DMR summaries in permit application). ICP-AES and ICP-MS analysis of the wastewater effluent have shown Se detections in some of LANL's samples. However, based on process knowledge, it is believed that the elevated Se levels are indicative of an analytical problem and not an actual Se contamination. The analysis of Se by traditional ICP-AES and ICP-MS is prone to analytical problems and interferences. EPA approved methods identify bromine as a common interference in the ICP-MS. The Laboratory uses bromine as a biocide in certain cooling towers. Cooling towers with high selenium values were reanalyzed using ICP-MS using a hydride generation preparation. Analytical results from these analyses have shown that selenium was non-detectable. Based on this information, the Laboratory requests a reduced sampling frequency from 1/month to 1/year.

The Laboratory requests that EPA include ICP-MS using hydride generation as an acceptable method for selenium analyses.

(6) Minimum Quantification Limits (MQLs):

The Laboratory requests that MQLs be specified for all parameters in the draft permit. If MQLs do not exist, the Laboratory may develop MQLs based on the permit process in Part II.A, paragraph 2 (MQL=3.3 x MDL). This information can be provided, upon request.

(7) :MQL Clarification:

Page 1, Part II.A. Minimum Quantification Level (MQL) states, in part: "*If any individual analytical test result is less than the minimum quantification level listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.*" Question: If the average value (from multiple samples collected) for a parameter is below the established MQL, can the permittee report zero on the DMR? Please advise.

(8) Other Issues

Typographical errors and minor edits are incorporated into the draft permit using "Tracked Changes". Longitude/Latitude modifications were based on new GPS readings collected during the re-application process.

(9) TRC

Outfall 03A021: On LANL's Form 2C, TRC was reported as 0.03 mg/l which is less than the MQL of 0.10 mg/l. A zero should have been reported on the Form 2C. The long term average for TRC for this outfall is 0.0 mg/l (see DMR summary). LANL recommends that the frequency of TRC analysis at Outfall 03A021 be the same as the rest of the 03A outfalls (1/year).

Outfall 03A 027: On Form 2C, TRC was reported as 0.0 mg/l. In the application data summary, a maximum of 0.5 mg/l and an average of 0.03 mg/l were reported. This was based on a maximum TRC value of 0.4 mg/l reported in Q4 CY 2001 and a maximum TRC value of 0.5 mg/l reported in Q1 CY 2002. The maximum permit limit during the permitted monitoring periods was 0.5 mg/l. EPA established a cooling tower compliance schedule for 2 years after the effective date of the February 2001 NPDES permit to reduce chlorine levels. During that time, EPA allowed LANL to install dechlorinators at the cooling towers. Due to these historic high results, the TRC average was skewed high. The frequency of TRC analysis at Outfall 03A027 should be the same as the other 03A outfalls (1/year).

(10) Sludge:

No sludge language was provided for review. Has the boilerplate language changed since the last permit? Can we get a copy of the new sludge language?

(11) Outfall 03A199:

NMED has expressed concern that Outfall 03A199 is a new discharge entering a 303(d) listed waters and therefore should be deleted from the proposed permit. Please note, Outfall 03A199 is permitted in the Laboratory's existing permit (issued December 29, 2000). Accordingly, the Laboratory has provided Discharge Monitoring Reports (No Flow DMRs) to EPA and NMED pursuant to the NPDES Permit NM0028355. The application for this outfall was submitted May 1998. The Laboratory recommends Outfall 03A199 remain in the permit.

To: Chen.Isaac@epamail.epa.gov
From: Marc Bailey <marc@lanl.gov>
Subject: NM0028355 Tritium Issue
Cc: steven Rae <stevenrae@lanl.gov>, saladen@lanl.gov, jacquezc@lanl.gov, beth Gray <bethg@lanl.gov>, "Gene E. Turner" <gturner@doeal.gov>, wardwell@lanl.gov, sandovalt@lanl.gov, bret_lucas@nmenv.state.nm.us
Bcc: marc Bailey <marc@lanl.gov>
Attached: C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\WPF.pdf; C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\01A74Rfinal1.doc; C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\WAC Chapter 31.doc; C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\RLW WAC Factsheet_LA-UR-04-729221.doc; C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\TA-55 Tritium.doc; C:\Documents and Settings\082445\My Documents\Re-application 2004\Info for Isaac Tritium\TA-21 Tritium.doc; C:\Documents and Settings\082445\My Documents\Re-application 2004\RLWCS Influent Schematic rev2.doc;

Mr. Chen-

Per your request, the Laboratory is providing supporting documentation and additional information concerning the accelerator-produced vs. reactor-produced tritium issue. To the best of our knowledge, the Laboratory has responded to all of your requests to date.

1) Procedures to identify and distinguish sources of tritium;

See attached files:
<u>01A74Rfinal1</u>
"Tritium and Strontium 90 Waste Stream Survey" identifies sources of tritium at the Laboratory. Section 2.1 identifies tritium waste generators. A complete list of the Laboratory Facilities that were surveyed for tritium can be found in Appendix A.

<u>WAC Chapter 31</u>
Chapter 3 of the LANL Waste Acceptance Criteria (WAC) document describes what can and cannot be discharged to the RLWTF for treatment (NPDES Outfall 051). Section 3.2 *Waste Profile Form* states: "All waste streams must be profiled using a Waste Profile Form (WPF)". And, "Waste Profile Forms must be updated annually on the anniversary date of the WPF approval". Table 3.0 identifies what wastes are "unacceptable" including accelerator produced tritium.

<u>RLWWAC Factsheet_LA-UR-04-72922</u>
This fact sheet provides an overview of the management procedures and criteria that are in place for wastewater discharge to the Radioactive Liquid Waste Collection System (RLWCS). It describes how sinks that are connected to the RLWCS are labeled. The label includes: "This drain is NOT for waste containing......Accelerator-produced tritium regulated by the Clean Water Act".

TA-21 Tritium and TA-55 Tritium
Memos documenting the reactor-produced tritium at the Laboratory's tritium facilities at TA-21 and TA-55.

WPF
Blank Waste Profile Form for your reference.

2) A sewer-line flow diagram shows all waste sources to Outfall 051 and any potential internal sampling points prior to Outfall 051 and/or other outfalls which have potential discharge tritium; and

See attached file:
RLWCS Influent Schematic rev2
Schematic of the facilities that are connected to the RLWCS. As per the requirements in Chapter 3 in the Waste Acceptance Criteria cited above, all waste streams must be profiled using a Waste Profile Form (WPF) prior to discharge into the RLWCS. Sampling of the proposed waste stream is necessary to complete the WPF. If the composition of the an approved waste stream changes, the waste stream must be re-characterized.

3) The maximum access of data/information EPA and NMED may have to verify the sources of tritium.

The Waste Profile Forms for the contributors to the RLWCS are maintained in the Laboratory's NWIS-Solid Waste Operations (SWO) Group's
database. This information is available on-site and available to EPA and NMED inspectors upon request.

Please contact me if more information would be helpful.

Marc Bailey

Marc Bailey (marc@lanl.gov)
ENV - Water Quality and Hydrology
Regulatory Compliance and Line Services Team
665-8135 699-4926 (cell)
MS K497

Permit process

EXHIBIT

EE

Los Alamos
NATIONAL LABORATORY
EST 1943

Environmental Stewardship Division (ENV-DO)
Water Quality & Hydrology Group (ENV-WQH)
P.O. Box 1663, Mail Stop K497
Los Alamos, New Mexico 87545
(505) 665-1859/FAX: (505) 665-9344

Date: March 30, 2006
Refer To: ENV-WQH: 06-059
LA-UR: 06-2193

RECEIVED
APR 06 2006
SURFACE WATER QUALITY BUREAU

Ms. Diane Smith
U.S. Environmental Protection Agency
Region 6 (6WQ-NP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

SUBJECT: **LOS ALAMOS NATIONAL LABORATORY**
NPDES PERMIT NO. NM0028355
COMMENTS ON DRAFT PERMIT

Dear Ms. Smith:

Enclosed are comments submitted by the University of California (the Laboratory) and the Department of Energy (DOE), Los Alamos Site Office, regarding the new draft National Pollutant Discharge Elimination System (NPDES) Permit for the wastewater treatment facilities at Los Alamos National Laboratory. The Laboratory and DOE wish to acknowledge the efforts of the EPA staff, specifically Isaac Chen, who prepared the new draft permit and documentation package.

Please enter this letter and the enclosed comments into the record of proceedings for NPDES Permit No. NM0028355. The Laboratory respectively requests that EPA consider these comments and include the proposed revisions in the final permit. Please be assured that the Laboratory is fully committed to comply with all requirements set forth in the final NPDES Permit.

Please contact Mike Saladen (505) 665-6085 of the Laboratory's Water Quality and Hydrology Group (ENV-WQH) or Gene Turner (505) 667-5794 of the DOE Los Alamos Site Office if you have questions concerning the enclosed comments or if additional information would be helpful.

Sincerely,

Steven Rae

Steven Rae
Group Leader
Water Quality & Hydrology Group

SV:MS/lm

Enclosure: a/s

Cy: Willie Lane, USEPA, Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA, Region 6, Dallas, TX, w/enc.
Marcy Leavitt, NMED/SWQB, Santa Fe, NM, w/enc.
Steve Yanicak, NMED/DOE/OB, w/enc., MS J993
Gene Turner, NNSA/LASO, w/enc., MS A316
Ken Hargis, ENV-DO, w/enc., MS J591
Doug Stavert, ENV-DO, w/enc., MS J591
Tori George, ENV-ES, w/enc., MS J591
Tina Sandoval, ENV-WQH, w/enc., MS K497
Mike Saladen, ENV-WQH, w/enc., MS K497
Marc Bailey, ENV-WQH, w/enc., MS K497
Phil Wardwell, LC-ESH, w/enc., MS A187
ENV-WQH File, w/enc., MS K497
IM-9, w/enc., MS A150

LOS ALAMOS NATIONAL LABORATORY
COMMENTS ON EPA'S DRAFT PERMIT NO. NM0028355
LA-UR-06-2193

General Comments:

1. EPA should not include effluent limits in the permit based on the water quality standards (WQS) approved by the New Mexico Water Quality Control Commission (WQCC) in 2005. To date, the WQS have not been approved by EPA. They have been challenged in a pending appeal to the New Mexico Court of Appeals, *New Mexico Mining Association et al. v. Water Quality Control Commission*, filed June 22, 2005. Also, please note that, pursuant to section 303 of the federal Clean Water Act, 33 USC1313(c), revised water quality standards adopted by a state pursuant to the triennial review requirement must be submitted to the EPA Administrator (delegated to the EPA Regional Director) for review and approval. Section 303(c)(3) provides that if the Administrator determines that the revised standards "meet the requirements of this chapter, such standard shall *thereafter be* the water quality standard for the applicable waters of that State." (Emphasis added.) The standards have not yet been approved, consequently they are not yet the water quality standard under the Clean Water Act. Therefore, they are not "applicable requirements" which the permit must meet under section 402 (33 USC 1342).

2. The Laboratory recommends EPA delete all language (definition, permit limits, footnotes, etc.) regarding tritium requirements in the proposed permit. The federal regulations under the federal Clean Water Act, 40 CFR 122.2 (definitions) define "pollutant" as follows: " Pollutant means dredged spoil, solid waste, . . .[and] radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 USC 2011 et seq.)) . . . ."

   As the note under this definition states, "Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials." The definitions of source, byproduct and special nuclear materials have previously been interpreted not to include accelerator-produced isotopes, and accelerator-produced tritium has been included as a regulated substance in past versions of the Laboratory's NPDES Outfall Permit.

   However, the Energy Policy Act of 2005, section 651(e)(1), amends the Atomic Energy Act to include accelerator-produced radioactive material in the definition of "byproduct material." Thus, tritium and other isotopes produced for research purposes at the Laboratory are byproduct material under the AEA (see 42 USC 2014(e)). They are therefore no longer within the definition of "pollutant" for purposes of the Clean Water Act, and are not regulated under the Clean Water Act. This amendment applies to tritium created before, on, or after the date of enactment of the amendment.

   Accordingly, the draft NPDES Permit and Fact Sheet for the Laboratory should not include limits for accelerator-produced tritium.

3. Based on the complexity of Permit No. NM0023855, including changes in monitoring and reporting requirements, the Laboratory will need to develop a new process for

generating computer-generated Discharge Monitoring Reports (DMRs). These DMRs will require EPA's approval. Unless the Laboratory is provided with sufficient time to prepare and submit draft computer-generated DMR forms for EPA's approval, we will need to submit the DMR information on draft forms, which can be reviewed and modified, if necessary, for future submittals. In previous years, DMRS have been required by EPA, in the month following the effective date of the permit. Please note, that the Laboratory has been using EPA approved computer, self-generated DMR forms, since February, 1999, which replicate EPA Form 3320-1. The Laboratory requests a 90 day period from the permit effective date to develop new DMR forms for EPA review and approval.

4. Pages 5, 9, 13, 16, 18, 21, 24, 27, 30, and 35 of Part I, Footnotes Section. Please add additional footnote with the following MQL language to all outfall categories (except NPDES Outfall 05A055): "*If any individual analytical test results is less than the minimum quantification level (MQL) listed at Part II. A of the permit, a value of zero (0) may be used for the Discharge Monitoring Report (DMR) calculations and reporting requirements*". This is consistent with the Laboratory's existing NPDES Permit and makes permit reporting requirements less confusing.

5. Please clarify Whole Effluent Toxicity Testing's 30-Day Avg. Min and 48-Hr. Min. requirements. Please add definitions for these monitoring requirements.

6. The Whole Effluent Toxicity Testing requires a 3-Hr composite for NPDES Outfalls 051, 05A055, 02A129, 03A021, 03A022, 03A027, 03A028, 03A048, 03A113, 03A130, 03A158, 03A160, 03A181, 03A185 and 03A199. All flows from these outfalls are intermittent and do not flow continuously for three hours. Therefore, we recommend the sampling type be changed from 3-Hr composite to grab sample requirements.

7. In footnote *1 for all outfalls concerning TRC the footnote states that NO MEASURABLE TRC at any time, yet in the PART II other conditions under paragraph A. MINIMUM QUANTIFICATION LEVEL (MQL) state that if any analytical test result is less than the MQL listed below (100 mg/L for TRC), a value of zero (0) may be used....The wording appears to contradict itself and is confusing. Please clarify this language in the draft NPDES Permit or delete footnote *1 for TRC.

8. Public comments brought up during the EPA Public Meeting on March 20, 2006, requested that EPA include perchlorate and plutonium limits in the Laboratory's NPDES Permit. There are currently no existing New Mexico water quality criteria for perchlorate or plutonium. Additionally, plutonium is included within the definition of special nuclear material in the Atomic Energy Act (42 USC 2014 (aa)). Therefore, it does not fall within the definition of "pollutant" for purposes of the Clean Water Act, and is not regulated under the Clean Water Act. Accordingly, effluent limits should not be developed or incorporated into the NPDES Permit for plutonium or perchlorate. Please note, that the proposed permit does include

perchlorate monitoring and reporting requirements at NPDES Outfall 051. The Laboratory agrees with these monitoring and reporting requirements.

9. The issue of representative sampling at TA-50 RLWTF (NPDES Outfall 051) was brought up during the March 20, 2006, EPA Public Meeting. The Laboratory has provided documentation to EPA that addresses these concerns. Corrective actions completed to date include a new discharge pump and pipe work installed in the WM-2 pump house, installation of a new sample pump and tubing to the Room 116 sample sink, and changing the effluent discharge to utilize the 3 inch diameter cross-country line. The Laboratory and NMED collected split samples simultaneously at the TA-50 NPDES sampling sink (Room 116) and at the NPDES outfall on January 9, 2006. Sampling data was provided to EPA on March 17, 2006. Sampling results indicated that NPDES Permit compliance parameters were not significantly different between the sampling sink and the outfall. AEA regulated radiological data was slightly higher at the outfall but within DOE Derived Concentration Guidelines (DCGs). This may be due to standing water remaining in the pipeline between batch flow discharges. Up to 150 gallons of treated effluent may remain in the line based on pipe length and diameter. Potential corrective actions are being evaluated to address this concern. Additionally, there are access and safety issues with sampling at the outfall during the winter season. The access road to the outfall is steep and often becomes icy and dangerous to aecess. The Laboratory recommends continued sampling at the Room 116 sampling sink due to these access and safety issues.
10. The Laboratory has provided supplemental hardness data for all outfalls included in the draft NPDES Permit (Please see **Enclosure 1**). This information was used by the Laboratory to re-evaluate EPA's Reasonable Potential spreadsheets. The hardness data was calculated from Level 4 data packages using NPDES Re-Application data and yearly 2005 Discharge Monitoring Report (DMR) data, and from additional samples collected in February, 2006, and March, 2006.

Permit Specific Comments:

1. NPDES Permit cover-page. Please specify which perennial and/or ephemeral/intermittent canyons reaches are located in Water Body Segments Nos. 20.6.4.126 and 20.6.4.128. The perennial reach of Sandia Canyon is the only reach located in Water Body No. 20.6.4.126. All other NPDES outfalls are located in ephemeral/intermittent reaches of Mortandad Canyon, Los Alamos Canyon, Sandia Canyon, Ten Site Canyon, Canon de Valle, and Water Canyon in Water Body Segment No. 20.6.4.128. Water quality standards are very different for stream reaches 20.6.4.126 and 20.6.4.128.

2. Page 1 of Part I. A. Outfall 001, Discharge Limitations/Reporting Requirements. Please delete the Monthly Average effluent limit for Total Residual Chlorine (TRC) to be consistent with other TRC limits in the permit (i.e. keep Daily Max requirement only). Based on the compliance history at Outfall 001 and the DMR summary

submitted in the Laboratory's 2004 Re-Application, the Laboratory recommends TRC monitoring frequency of 1/week be changed to 1/month.

3. Page 1 of Part I. A., Outfall 001, Discharge Limitations/Reporting Requirements, and Monitoring Requirements. The Laboratory has re-evaluated the reasonable potential (RP) for zinc (Zn) using new hardness data collected at Outfall 001. The average hardness data of 73 mg/l and the maximum hardness of 93 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluation (Please see **Enclosure 2**), there is no reasonable potential for effluent quality at NPDES Outfall 001 to exceed the Zn water quality standard in stream segment 20.6.4.126. Therefore, please delete the Zn effluent limit and monitoring requirements from Outfall 001.

4. The effluent limitation for total aluminum (Al) in the draft permit for Outfall 001 (Power Plant wastewater) is 58 ug/l (monthly average) and 87 ug/l (daily maximum). However, the water quality standards (WQS) define 87 ug/l of *dissolved* aluminum as a *chronic* standard, intended to avoid impacts from long term exposure (see 20.6.4.900.J). Accordingly, the draft permit should be revised to make 87 ug/l the monthly average, and use the acute stream standard of 750 ug/l for the daily maximum (See 20.6.4.900 J) to address the short term exposure impacts.

5. Page 3 of Part I. A., Outfall 001, Monitoring Frequencies. Please change pH monitoring requirement to once per month. The Laboratory's existing permit requires pH and TRC to be collected at a once per month frequency. The pH data provided in the NPDES Permit Re-Application (August 2004) consisted of the maximum and minimum pH values recorded over the past 6 years at each outfall, including Outfall 001. The Laboratory provided EPA with supplemental information showing the maximum, minimum, and long term average for all outfalls from 1/1/98 through 12/31/2003. During this time period there were only 3 exceedances of the maximum pH limit out of 863 samples collected at all outfalls. Corrective actions were taken to mitigate recurrence. As a result, there has not been a pH exceedance since December 17, 2002. Based on best professional judgment (BPJ), the long term averages and the compliance record for pH monitoring, the Laboratory recommends that the frequency of pH analysis remain consistent with the existing permit frequency.

6. Page 4 of Part I. A., Outfall 001, Sampling Locations And Other Requirements, states in part: "*PCBs... There shall be no discharge of PCB compounds such as those commonly used for transformer fluid from power plant operation sources to Outfall 001.*" Page V-9 of the Laboratory's Form 2c NPDES Re-Application documents the presence of PCBs 1242, 1254, 1248, and 1260 based on sludge data showing residual low levels of PCBs at the TA-46 Sanitary Wastewater System (SWWS) Facility. Treated effluent from the TA-46 SWWS Facility discharges through Outfall 001, when the treated effluent is not re-used in cooling towers at Technical Area 3. The Laboratory recommends EPA delete this paragraph and incorporate monitoring and reporting requirements on Page 1 of Part I. Alternatively, EPA could incorporate the

following language: "The effluent shall contain NO MEASURABLE PCBs. NO MEASUREABLE will be defined as no detectable concentrations of PCBs as determined by any approved method established in 40 CFR 136". To date, NPDES compliance effluent data has not documented the presence of PCBs using 40 CFR 136 analytical methods.

7. Page 5 of Part I. A., Outfall 001, Footnote *2. More stringent effluent limits were established in the proposed permit for total aluminum (Al), and total zinc (Zn). Based on the Laboratory's re-calculation of the reasonable potential for Zn, footnote *2 needs to be modified to delete the reference to total Zn (see Permit Specific Comment #3). Regarding aluminum, it is our understanding that: (a) EPA is reassessing the data in its criteria document for aluminum; and (b) NMED is aware that many areas in New Mexico have naturally high levels of aluminum, and has expressed the view that aluminum levels will have to be set on a canyon specific basis. Additionally, Footnote *4 requires the Laboratory to meet the new temperature requirement within 3 years of the effective date of the permit. The Laboratory needs to conduct initial investigations to insure that it can meet the new requirements for total Al, temperature, and potentially Whole Effluent Toxicity. The Laboratory requires the following compliance schedule to secure funding, and to develop and implement corrective measures to meet the new effluent limits:

   a. 2 years after the effective date of the NPDES Permit to develop Pre-Project Planning and a Conceptual Design to determine the path forward, cost estimates and funding requests.
   b. 4 years after the effective date of the NPDES Permit to complete Preliminary Design and Final Design packages.
   c. 6 years after the effective date of the NPDES Permit to initiate and complete construction and to achieve compliance with permit limits.

   Assuming that funding can be secured, a schedule of 6 years will be required to implement corrective measures for NPDES Outfall 001.

8. Page 6 and 7 of Part I, Outfall 13S, Discharge Limitations/Reporting Requirements. The draft permit incorporates new total Zn limits of 97.8 ug/l (monthly average) and 146.7 ug/l (daily maximum) for Outfall 13S. The Laboratory has re-evaluated the reasonable potential (RP) for total Zn using new hardness data collected at Outfall 13S. The average hardness data of 88 mg/l and the maximum hardness of 95 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 3**), there is no reasonable potential for effluent quality at NPDES Outfall 13S to exceed the water quality standard for Zn. Therefore, please delete the Zn effluent limit and monitoring requirements from Outfall 13S.

9. Page 7 of Part I, Outfall 13S, Effluent Characteristic, Discharge Monitoring. The Laboratory recommends that EPA modify footnote *5 to require bio-monitoring (48

Hr. Static Renewal Test) at Outfall 13S, only if Outfall 13S discharges directly into Canada del Buey as stated in Section 5, paragraph 4, page 17 of the Fact Sheet.

10. Page 9 of Part I, Outfall 13S, Footnotes. Please delete Footnote *4 based on Permit Specific Comments #9. Please change Footnote *5 to * 4 because the original *4 was deleted.

11. Page 10 of Part I, Outfall 051- TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF), Discharge Limitations/Reporting Requirements. The federal regulations under the federal Clean Water Act, 40 CFR 122.2 (definitions) define "pollutant" as follows: " Pollutant means dredged spoil, solid waste, . . .[and] radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 USC 2011 et seq.)) . . . ."

    As the note under this definition states, "Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials." The definitions of source, by product, and special nuclear materials have previously been interpreted not to include accelerator-produced isotopes, and accelerator-produced tritium has been included as a regulated substance in past versions of the Laboratory's NPDES Permit.

    However, the Energy Policy Act of 2005, section 651(e)(1), amends the Atomic Energy Act to include accelerator-produced radioactive material in the definition of "byproduct material." Thus, tritium and other isotopes produced for research purposes at the Laboratory are byproduct material under the AEA (see 42 USC 2014 (e)). They are therefore no longer within the definition of "pollutant" for purposes of the Clean Water Act, and are not regulated under the Clean Water Act. This amendment applies to tritium created before, on, or after the date of enactment of the amendment.

    Accordingly, the draft NPDES Permit and Fact Sheet for the Laboratory should not include limits for accelerator-produced tritium.

12. Page 11 of Part I, Outfall 051, Discharge Limitations/Reporting Requirements. The radioactive liquid wastewater (RLW) system does not add chlorine as part of its treatment processes, or in its collection system other than rinse water. The TRC results should have been reported as zero on the 2004 Permit Re-Application because it was below the minimum quantification level (MQL) and the QC spike indicated matrix interference. Based on this information, there is no RP for exceeding water quality standards for TRC. Please delete chlorine requirements from the draft permit.

13. Page 12 of Part I, Outfall 051, Effluent Characteristics. Discharge from the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) discharges in batch flow (i.e. intermittent) and discharges last between 1 to 1.5 hours. Therefore, the Laboratory

cannot collect the 3-hr composite sample, as required for whole effluent toxicity testing. The Laboratory recommends EPA change "sample type" to grab sample.

14. Page 12 of Part I, Outfall 051, Footnotes. Please delete *2 footnote based on previously noted modification of the Energy Policy Act of 2005.

15. Page 13 of Part I, Outfall 051, Footnotes. Please delete Footnote *5. The RLWTF does not treat its wastewater with chlorine nor dechlorinate the wastewater prior to final disposal (Please see comment 12).

16. Page 15 of Part I, Outfall 05A055 – High Explosives Wastewater Treatment Facility (HEWTF), Monitoring Requirements. The HEWTF discharges approximately 3000 gallons every other month. The Laboratory recommends the monitoring requirements for pH, RDX and flow be revised to 1/month based on DMR flow summary, this outfall's excellent compliance record, and intermittent discharge characteristics (batch flow).

17. Page 17 of Part I, Outfalls 03A021, 03A022, and 03A181, Discharge Limitations/Reporting Requirements. NPDES Outfall 03A022 has a proposed monthly average of 8.3 ug/l and a daily maximum of 12.4 ug/l for total copper (Cu). The Laboratory has re-evaluated the reasonable potential (RP) for total Cu using new hardness data collected at Outfall 03A022. The average hardness data of 69 mg/l and the maximum hardness of 99 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 4**), there is no reasonable potential for effluent quality at NPDES Outfall 03A022 to exceed the water quality standard for Cu in Mortandad Canyon in stream segment 20.6.4.128. Therefore, please delete the Cu effluent limit and monitoring requirements from Outfall 03A022

18. Page 17 of Part I, Outfalls 03A021, 03A022, and 03A181, Monitoring Requirements. The Laboratory recommends the monitoring requirements for Flow (1/day) and TRC (1/week) be reduced to 1/quarter. This recommendation is consistent with existing permit monitoring requirements, is similar to proposed monitoring requirements for other parameters for this outfall category, and is based on the intermittent flow characteristics and on the outfall compliance history. Justification was not provided for increased monitoring based on RP or documented in the Fact Sheet.

19. Page 18 of Part I, Outfalls 03A021, 03A022 and 03A181, Monitoring Requirements. The Laboratory recommends the monitoring requirements for pH (1/week) be reduced to 1/quarter which is consistent with existing permit requirements, similar to proposed monitoring requirements for other outfall parameters for this outfall category, and is based on intermittent flow characteristics and the outfall compliance history. Reasons were not provided for increased monitoring based on RP or documented in the Fact Sheet.

20. Page 18 of Part I, Outfalls 03A021, 03A022, and 03A181, Footnotes *2, *3, and *4. Based on comment provided above (Permit Specific Comments #17) there is no RP for total Cu to exceed applicable stream standards. Therefore, please delete footnotes *2, *3 and *4.

21. Page 20 of Part I, Outfalls 03A027, 03A113, and 03A199. Outfall 03A113 does not discharge into stream segment 20.6.4.126 of Sandia Canyon. Please clarify that NPDES Outfalls 03A027 and 03A199 discharge into stream segment 20.6.4.126, and NPDES Outfall 03A113 discharges into the ephemeral/intermittent stream segment 20.6.4.128.

22. Page 20 of Part I, Outfalls 03A027, 03A113, and 03A199, Monitoring Requirements. Please reduce effluent monitoring requirements for flow (1/day), TRC (1/week) and pH (1/week) to 1/month. This recommendation is based on the intermittent flows at the outfalls and the DMR compliance summary records for these discharges. Monitoring of 1/month is more stringent than the existing permit monitoring requirement of 1/quarter. The Fact Sheet did not justify the increased monitoring frequency.

23. Page 20 of Part I, Outfalls 03A027, 03A113 and 03A199, Monitoring Requirements. The draft permit requires total Cu monitoring at Outfall 03A027. The Laboratory has re-evaluated the reasonable potential (RP) for total Cu using new hardness data collected at Outfall 03A027. The average hardness data of 110 mg/l and the maximum hardness of 117 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 5**), there is no reasonable potential for effluent quality at NPDES Outfall 03A027 to exceed the water quality standard for Cu in Sandia Canyon in stream segment 20.6.4.126. Therefore, please delete the Cu monitoring requirement from Outfall 03A027.

24. Page 21 of Part I, Outfalls 03A027, 03A113 and 03A199, Monitoring Requirements, Footnote *2. Please delete footnote *2 based on comments provided above (see Permit Specific Comments #23).

25. Page 21 of Part I, Outfalls 03A027, 03A113, and 03A199, Monitoring Requirements, Footnote *3. Outfall 03A027 may not meet pH requirement (Max 8.8). The Laboratory requests a 2 year compliance schedule be incorporated into the NPDES Permit to meet the pH requirement. Change Footnote *3 to Footnote *2 (see Permit Specific Comments #24)

26. Page 22 of Part I, Outfalls 03A028, 03A130 and 03A185, Discharge Limitations/Reporting Requirements. The draft permit has incorporated effluent limits of 8.3 ug/l (monthly average) and 12.4 ug/l (daily maximum) for total Cu at Outfall 03A028. The PHERMEX facility is no longer occupied and the cooling tower that supported this facility (Outfall 03A028) has been taken out of service. A work order has been requested to plug all floor drains from PHERMEX to the cooling

tower. The Laboratory will request EPA and NMED visit the site to verify there is no flow from the cooling tower. The Laboratory recommends Outfall 03A028 be deleted from the draft NPDES Permit. If the outfall can not be deleted from the permit, the following information is applicable to Outfall 03A028. The Laboratory re-evaluated the reasonable potential (RP) for total Cu using new hardness data collected at Outfall 03A028. The average hardness data of 161 mg/l and the maximum hardness of 201 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 6**), there is still a reasonable potential for effluent quality at NPDES Outfall 03A028 to exceed the water quality standard for Cu in Water Canyon in stream segment 20.6.4.128. However, based on the hardness data the effluent Cu effluent limit should be changed to 41 ug/l (monthly average) and 61 ug/l (daily maximum).

27. Page 22 of Part I, Outfalls 03A028, 03A130 and 03A185, Discharge Limitations/Reporting Requirements. The draft permit has incorporated effluent limits of 8.3 ug/l (monthly average) and 12.4 ug/l (daily maximum) for total Cu at Outfall 03A130. Additionally, Outfall 03A130 has total Zn effluent limits of 87.3 ug/l (monthly average) and 131 ug/l (daily maximum). The Laboratory re-evaluated the reasonable potential (RP) for total Cu using new hardness data collected at Outfall 03A130. The average hardness data of 130 mg/l and the maximum hardness of 157 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 7**), there is still a reasonable potential for effluent quality at NPDES Outfall 03A130 to exceed the water quality standard for Cu in Water Canyon in stream segment 20.6.4.128. However, based on the new hardness data the effluent Cu effluent limit should be changed to 29.3 ug/l (monthly average) and 43.9 ug/l (daily maximum).

    The Laboratory also re-evaluated the RP for Zn using the same hardness data (130 mg/l average and 157 ug/l maximum). Based on the new RP evaluations (Please see **Enclosure 7**), there is not a reasonable potential for effluent quality at NPDES Outfall 03A130 to exceed the water quality standard for Zn in Water Canyon in stream segment 20.6.4.128. Therefore, please delete the Zn effluent limit and monitoring requirements from the draft permit.

28. Page 22 of Part I, Outfalls 03A028, 03A130 and 03A185, Discharge Limitations/Reporting Requirements. The draft permit has incorporated total cyanide limits of 3.5 ug/l (monthly average) and 5.2 ug/l (daily maximum) for Outfalls 03A130 and 03A185. The EPA Permit Writer requested additional information for cyanide, weak acid dissociable based on analytical interferences in the methods used in the permit re-application process. This information is tabulated (Please see **Enclosure 8**) and includes the cyanide result using method 4500 CN-I for Outfall 03A130. Based on the new data there is no reasonable potential for cyanide to exceed the water quality standard at Outfall 03A130 and 03A185 (Please see **Enclosures 7 and 8**). Please delete the total cyanide effluent limit and monitoring requirement from the draft permit.

29. Page 23 of Part I, Outfalls 03A028, 03A130 and 03A185, Monitoring Requirements. The Laboratory recommends the monitoring requirements for flow (1/day), TRC (1/week), and pH (1/week) be revised to 1/month. This recommendation is based on the intermittent flows from these outfalls, 1/month is still more stringent than existing permit monitoring requirements, 1/month is consistent with other outfall monitoring requirements, and the DMR summary compliance history is good. Reasons were not provided for increased monitoring requirements in the Fact Sheet.

30. Page 24 of Part I, Outfalls 03A028, 03A130 and 03A185, Footnotes *2 and *3. Please delete reference to Outfall 03A028 from Footnotes *2 and *3 based on Permit Specific Comments #26. Delete reference to Zn requirement in Footnotes *2 and *3 based on Permit Specific Comments #27. Delete cyanide requirements from Footnotes *2 and *3 based on Permit Specific Comments #28.

31. Page 25 of Part I, Outfalls 03A048 and 03A158. NPDES Outfall Permit 03A048 is associated with TA-53-964 and 979. Please delete reference to TA-53-963 and 978 in the proposed permit.

32. Page 25 of Part I, Outfalls 03A048 and 03A158, Discharge Limitations/Reporting Requirements. The draft permit incorporates effluent limits for total arsenic (As) of 9.5 ug/l (monthly average) and 14.2 (daily maximum) for Outfall 03A048. Additionally, the draft permit has total Cu limits of 8.3 (monthly average) and 12.4 ug/l (daily maximum) for Outfalls 03A048 and 03A158. The Laboratory re-evaluated the reasonable potential (RP) for both total As and total Cu using new hardness data collected at Outfall 03A048 and 03A158. The average hardness data of 102 mg/l and the maximum hardness of 145 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet for 03A048. Based on the new RP evaluations (Please see **Enclosure 9**), there is still a reasonable potential for effluent quality at NPDES Outfall 03A048 to exceed the water quality standards for As and Cu in Los Alamos Canyon in stream segment 20.6.4.128. However, based on the new hardness data the Cu effluent limit should be changed to 28.6 ug/l (monthly average) and 42.8 ug/l (daily maximum). The As limit does not change.

 The average hardness data of 59 mg/l and the maximum hardness of 91 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet for 03A158. Based on the new RP evaluations (Please see **Enclosure 10**), using the new "average" hardness data there is still a reasonable potential for effluent quality at NPDES Outfall 03A158 to exceed the water quality standard for Cu in Los Alamos Canyon in stream segment 20.6.4.128. However, based on using the new "maximum" hardness data there is not a RP for Cu. Therefore, the Laboratory recommends deletion of the Cu limit and monitoring requirements for 03A158. If EPA disagrees, the Cu effluent limit should be changed to 12.3 ug/l (monthly average) and 18.5 ug/l (daily maximum) based on the average hardness data.

33. Page 25 and 26 of Part I, Outfalls 03A048 and 03A158, Discharge Limitations/Reporting Requirements, and Monitoring Requirements. Delete monitoring and reporting requirements for tritium based on revisions to the Energy Policy Act of 2005.

34. Page 26 of Part I, Outfalls 03A048 and 03A158, Monitoring Requirements. The Laboratory recommends the monitoring requirements for flow (1/day), TRC (1/week), and pH (1/week) be revised to 1/month. This recommendation is based on the intermittent flows at these outfalls, 1/month is still more stringent than existing permit, 1/month is consistent with other outfall monitoring requirements, and the DMR summary compliance history is good. Justification was not provided for increased monitoring in Fact Sheet.

35. Page 27 of Part I, Outfalls 03A048 and 03A158, Footnotes *4 and *5 apply only to Outfall 03A048.

36. Page 27 of Part I, Outfalls 03A048 and 03A158, Footnotes *6. Please delete footnote based on modification to Energy Policy Act of 2005.

37. Page 28 of Part I, Outfall 03A160. Discharge Limitations/Reporting Requirements. The draft permit has incorporated new effluent limits for total Cu of 8.3 ug/l (monthly average) and 12.4 ug/l (daily maximum). Additionally, the draft permit incorporates new total Zn effluent limits of 87.3 ug/l (monthly average) and and 131 ug/l (daily maximum). The Laboratory re-evaluated the reasonable potential (RP) for both total Zn and total Cu using new hardness data collected at Outfall 03A160. The average hardness data of 88 mg/l and the maximum hardness of 95 mg/l were incorporated into EPA's Reasonable Potential (RP) spreadsheet. Based on the new RP evaluations (Please see **Enclosure 11**), there is still a reasonable potential for effluent quality at NPDES Outfall 03A160 to exceed the water quality standard for Cu in Ten Site Canyon in stream segment 20.6.4.128. However, based on the new hardness data the Cu effluent limit should be changed to 23.3 ug/l (monthly average) and 34.9 ug/l (daily maximum). Based on the new hardness data for Zn, there is no RP for exceedance of the Zn water quality standard. Therefore, please delete the effluent limits and monitoring requirements for Zn at Outfall 03A160.

38. Page 29 of Part I, Outfall 03A160, Monitoring Requirements. The Laboratory recommends the monitoring requirements for flow (1/day), TRC (1/week), and pH (1/week) be revised to 1/month based on the intermittent flows from this outfall, 1/month is more stringent than the existing permit, 1/month is consistent with other outfall monitoring requirements, and the DMR summary compliance history for this outfall is good. Reasons were not provided for increased monitoring requirements in Fact Sheet.

39. Page 30 of Part I, Footnote *3. Please delete Footnote *3 for Zn based on Permit Specific Comments #36).

40. Page 31 of Part I, Outfalls 03A021, 022, 027, 028, 048, 113, 130, 158, 160, 181, 185, and 199. Discharges are intermittent and do not discharge for three hours, therefore, the Laboratory can not collect a 3 hr. composite sample for bio-monitoring. The Laboratory requests the sample type be changed to grab sample.

41. Page 33 and 34 of Part I, Outfall 02A129, Monitoring Requirements. The Laboratory recommends the monitoring requirements for flow (1/day), TRC (1/week), and pH (1/week) be revised to 1/month. This recommendation is based on intermittent flow from this outfall, it is more stringent than existing permit, it is consistent with other outfall monitoring requirements and the DMR summary compliance history for this outfall is good. The reasons were not provided for increased monitoring requirements in Fact Sheet. Please delete monitoring requirement for TRC based on Permit Specific Comments #42.

42. Page 33 of Part I, Outfall 02A129, Monitoring Requirements. More stringent effluent limits were established in the proposed permit for total Cu, and Whole Effluent Toxicity Testing. The Laboratory needs to conduct initial investigations to insure that it can meet the new requirements. The Laboratory requires the following compliance schedule to secure funding, and to develop and implement corrective measures to meet the new Cu effluent limit:

    a. 2 years after the effective date of the NPDES Permit to develop Pre-Project Planning and a Conceptual Design to determine the path forward, cost estimates and funding requests.
    b. 4 years after the effective date of the NPDES Permit to complete Preliminary Design and Final Design packages.
    c. 6 years after the effective date of the NPDES Permit to initiate and complete construction and achieve compliance with the permit limits.

    Assuming funding is secured, a schedule of 6 years is required to implement corrective measures for NPDES Outfall 02A129.

    Additionally, the TRC was reported as zero on the Laboratory's 2004 NPDES Re-Application. The TA-3 Steam Plant uses potable water at it's facility, but does not add chlorine as part of it's treatment of waste streams. Based on this information, there is not a reasonable potential for TRC to exceed the water quality standard. Please delete the TRC requirement from the draft permit. If TRC is not removed from the draft permit, the Laboratory will need to incorporate this into the compliance schedule.

43. Page 34 of Part I, Effluent Characteristics. Discharge from the TA-21 Steam Plant. Discharges will vary from 1 to 3 hours and therefore the Laboratory cannot meet the

3-hr. composite sampling requirement for bio-monitoring. The Laboratory recommends a change in monitoring type to grab sample.

44. Page 35 of Part I, Footnote *1. Please delete Footnote *1 based on Permit Specific Comments # 42.

45. Page 35 of Part I, Footnote *2 and *3. Footnote *2 needs to be modified based on comments provided in Permit Specific Comments #42. Change this footnote to *1 based on Permit Specific Comments #44. Please change Footnote *3 to Footnote *2.

46. Page 36 of Part I.B. Schedule of Compliance. Modification to the compliance schedule is documented by tracked changes on the draft permit. Please delete references to the compliance schedule for total zinc based on the permit specific comments and re-evaluation using EPA's reasonable potential process. Also please delete reference to Outfall 03A028 because the Laboratory is recommending that it be deleted from the permit. Please delete the reference to the copper limit for Outfall 03A022 based on permit specific comments. Please modify Total Cyanide language based on permit specific comments.

    Please delete reference to the compliance schedule for selenium at Outfall 03A027 since there is no permit requirement for selenium at this outfall. Additionally, the total selenium result reported on Form 2C (3.3 ug/L) was using EPA Method 200.8. When analyzing for selenium using this method, if bromine is present in the sample, a false positive detection of selenium can occur. The cooling tower that discharges to Outfall 03A027 uses bromine as part of the water treatment and samples collected during the first part of CY 2005 indicated selenium could be present. Re-analysis of these samples by an alternate EPA-approved method demonstrated that selenium was not present. See **Enclosure 12** for additional information. The Laboratory recommends no selenium monitoring requirement at Outfall 03A027.

    The Laboratory request the exceedance determination (sub-tier a.) be changed from 6 months to 12 months and development requirements for controls (sub-tier b.) be changed from 1 year to 18 months based on the complexity of these facilities and worker authorization processes. Please add language to sub-tier c. to include "unless otherwise specified in permit" to the end of the sentence based on Permit Specific Comments (i.e. Outfalls 001, 02A129, 03A199).

47. Page 37 of Part I.C. REPORTING OF MONITORING RESULTS (MAJOR DISCHARGERS) states in part,
    "*Monitoring information shall be on Discharge Monitoring Report Form(s) EPA 3320-1 as specified in Part III.D.4 of this permit and shall be submitted monthly.*

    2. The permittee is required to submit regular monthly reports as described Above postmarked not later than the 15th of the month following each reporting period."

The DMR submittal date of the 28th day was negotiated between the Laboratory, New Mexico Environment Department (NMED), and EPA's Enforcement and Permits Branches during the last permit process period (2000-2005) in order to assure that results from samples collected during the month be available for including in the monthly DMRs. Submittal by the 28th day of the following month was also required to allow adequate time for quality assurance of the data. The Laboratory requests that the 28th day of the month be included in the new permit to allow the Laboratory to receive all NPDES compliance data back from the analytical laboratory and complete all quality assurance reviews in time to meet the NPDES Permit submittal deadline.

48. It is the Laboratory's understanding that EPA rates all facilities on a point system to determine if the permittee is a "Major" or "Minor" treatment facility. The Laboratory requests clarification regarding its classification as a "Major" discharger". Please provide the criteria for this determination.

49. Page 1 of Part II.A. Minimum Quantification Level (MQL). In addition to the MQLs listed, Laboratory requests that MQLs be specified for sulfite, phosphorus, Oil and Grease, RDX, TNT, nickel, Ra 226+228, COC, BOD, TSS, TTOs, perchlorate, and iron in the draft permit.

50. Page 1 of Part II.B. 24 Hour Reporting. Please delete reference to Zinc, TRC and Cyanide based on permit specific comments. In the Laboratory's existing permit, TRC is not listed as a parameter requiring 24-hr oral reporting of daily maximum limitation violations. Reasons were not provided in the Fact Sheet for including this reporting requirement for TRC in the draft permit. The Laboratory recommends removing TRC from this requirement

51. Page 3 of Part II, Paragraph D. Tritium. Please delete paragraph based on modifications to Energy Policy Act of 2005.

52. Page 3 of Part II, Paragraph F. Co-Permittees. On June 1, 2006, the University of California will no longer operate the Los Alamos National Laboratory. The permit will be transferred to Los Alamos National Security (LANS) LLC. The Laboratory will provide written notification to EPA as required by the NPDES Permit.

53. Page 4 of Part II, Paragraph H Test Methods. Method ANC335, R-1 (Tritium in Environmental Matrices--Distillation and LS Counting) is a method used by the Laboratory's Analytical Chemistry Sciences Group. This internal Group is no longer performing tritium analyses for the Laboratory, so this method should be deleted from the draft permit. EPA Method 906 should be added for tritium analysis if tritium "report only" remains in permit.

EPA Methods 904.0 and 903.1 are not gamma spec methods and this descriptor should be removed. These methods are currently being used for radium analyses. EPA Method 904.0 is used for Ra228 and EPA Method 903.1 is used for Ra226.

54. Part IV Sludge Regulations. The Laboratory disposes of its sludge off-site. Most of the boiler-plate language in Part IV of the draft permit does not apply. The Laboratory recommends that the sludge language be revised to address off-site disposal only.

55. Summary of Proposed Schedules of Compliance. The Laboratory recommends the following schedules of compliance to complete corrective actions necessary to achieve compliance with proposed effluent limits.

Outfall 001 and Outfall 02A129:

a. 6 months after the effective date of the NPDES Permit to achieve compliance with permit requirements for pH.
b. 2 years after the effective date of the NPDES permit to develop Pre-Project Planning and a Conceptual Design to determine the path forward, cost estimates and funding requests.
c. 4 years after the effective date of the NPDES permit to complete Preliminary Design and Final Design packages.
d. 6 years after the effective date of the NPDES permit to initiate and complete construction and achieve compliance with the permit limits for aluminum, WET, and temperature.

Outfalls 03A027 and 03A199: 2 years from effective date of permit to achieve compliance with new effluent limit for pH.

Outfalls 051, 03A130, 03A160, and 03A185: 3 years from effective date of permit to achieve compliance with new effluent limit for copper.

Outfall 03A048: 3 years from effective date of permit to achieve compliance with new effluent limits for arsenic and copper.

Outfalls 13S, 05A055, 03A021, 03A022, 03A113, 03A158, 03A181: No compliance schedule.

Outfall 03A028: Delete from NPDES Permit.

Revisions to this proposed schedules of compliance may be required depending on addition or deletion of other effluent limits.

ENCLOSURE 1

NPDES PERMIT No. NM0028355 OUTFALL HARDNESS DATA

	HARDNESS CALCULATED FROM LEVEL 4 DATA PACKAGES (RE-APPLICATION DATA AND YEARLY DMR DATA)				HARDNESS FROM SAMPLES COLLECTED IN 2006										
Outfall Number	2004 Re-App	Hardness (as CaCO3) mg/L	2005 WQP	Hardness (as CaCO3) mg/L	2006 Sample 1	SDG #	Hardness (as CaCO3) mg/L	2006 Sample 2	SDG #	Hardness (as CaCO3) mg/L	2006 Sample 3	SDG #	Hardness (as CaCO3) mg/L	Outfall Number	Avg. Hardness (as CaCO3) mg/L
001	5/26/2004	66.68177	7/13/2005	43.79185	2/14/2006	156071	75.1000	2/22/06	156665	85.5000	3/9/2006	157758	92.7000	001	72.754724
02A129	5/11/2004	14.11375	9/15/2005	6.380354	3/13/2006	158018	1.3700							02A129	7.2880
03A021	5/26/2004	58.66793	7/25/2005	82.17055	off-line									03A021	70.41924
03A022	4/21/2004	39.88192	7/14/2005	98.83139	3/21/06		112.0000							03A022	83.5711
03A027	3/29/2004	115.1278	7/13/2005	99.22585	2/22/2006	156664	117.0000							03A027	110.4512
03A028	3/29/2004	120.916	4/18/2005	200.8211	No discharge									03A028	160.86855
03A048	5/4/2004	144.5796	9/8/2005	*131.4482	2/22/2006	156664	52.5000	3/7/06	157571	110.0000				03A048	102.3599
03A113	5/4/2004	110.62	9/14/2005	100.6823	3/7/2006	157571	75.7000	3/7/06	157571	75.7000				03A113	90.6756
03A130	6/8/2004	93.28409	7/19/2005	139.8933	2/15/2006	156222	157.0000							03A130	130.0591
03A158	5/20/2004	84.36896	4/21/2005	90.91121	No discharge			3/14/06	158060	2.2800				03A158	59.1867
03A160	6/18/2004	94.73841	12/16/2005	79.28307	3/16/2006	158357	89.5000							03A160	87.8405
03A181	4/27/2004	94.637	3/23/2004	92.46684	3/2/2006		123.0000	3/13/06	158016	97.3000				03A181	101.8510
03A185	4/19/2004	71.59	9/14/2005	84.03558	3/10/2006	157900	105.0000							03A185	86.8752
03A199	1/21/2005	95.31126	8/4/2005	107.9653	3/7/2006	157571	157.0000							03A199	120.0922
051	6/9/2004	0.85647	5/19/2005	0.800701	2/6/2006	156666	0.1000	2/21/06	156666	0.1010				051	0.4645
05A055	5/3/2004	0.076574	2/28/2005	0.402895	No discharge									05A055	0.2397345
13S	3/31/2005	81.841			3/9/2006	157786	95.1000							13S	88.4705

ENC E 2

ORIGINAL EPA SPREADSHEET USING AVG
SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 **OUTFALL 001**

	A	B	C	D	I	J	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no)				1					
40	Receiving Stream TSS (mg/l)				6.4		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)				13.4-27					
45	pH (Avg)				6.9-8.9					
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams.			
47	Fraction of Critical Low Flow				0					
273	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Conc	Monthly Ave.
274			CAS No.	STORET	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
275	**Radioactivity, Nutrients, and Chlorine**									
276	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	87	N/A	87	58
277	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
278	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
279	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
280	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
281	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A
282	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
283	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A
284	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A
285	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A
286	Gross Alpha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A
287	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A
288	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A
289	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A
290	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A
291	**METALS AND CYANIDE**									
292	**Antimony, dissolved (P)**		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
293	**Arsenic, dissolved (P)**		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
294	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
295	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
296	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
297	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
298	Copper, dissolved		7440-50-8	01042	N/A	N/A	N/A	N/A	N/A	N/A
299	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
300	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
301	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
302	**Nickel, dissolved (P)**		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
303	**Selenium, dissolved (P)**		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
304	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A
305	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
306	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
307	**Thallium, dissolved (P)**		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
308	**Zinc, Dis. (P)**		7440-66-6	01092	N/A	88.0812188	88.8016368	N/A	175.1476826	116.7652652
309	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
310	Cyanide, weak acid dissociat		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

SPREADSHEET USING AVG
EFFLUENT HARDNESS
(NEW DATA)
OUTFALL 001

	I
	1
	1
	6.4
	73
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
87	68
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
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N/A	N/A
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N/A	N/A
N/A	N/A
N/A	**N/A**
N/A	N/A
N/A	N/A

SPREADSHEET USIN
EFFLUENT HARDN...
(NEW DATA)
OUTFALL 001

	I
	1
	1
	6.4
	93
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
87	58
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	**N/A**
N/A	N/A
N/A	N/A

= No change with new hardness data.

N/A = No RP with new hardness data. Recommend no effluent limit in permit.

EN[illegible] RE 3

ORIGINAL EPA SPREADSHEET USING AVG
SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 **OUTFALL 13S**

	A	B	C	J	K	L	M	N	O
32	Are acute aquatic life criteria considered (1=			1					
33	Are chronic aquatic life criteria considered (			0					
40	Receiving Stream TSS (mg/l)			2.6		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO			41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (c			0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs			0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)			13.4-27					
45	pH (Avg)			6.9-8.9					
46	Fraction of stream allowed for mixing (F)			1		Enter 1, if stream morphology data is not available or for intermittent streams.			
47	Fraction of Critical Low Flow			0					
271	POLLUTANTS			Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Co	Monthly Ave.
272			CAS No.	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
273	Radioactivity, Nutrients, and Chlorine								
274	Aluminum, dissolved		7429-90-5	N/A	N/A	N/A	N/A	N/A	N/A
275	Barium, dissolved		7440-39-3	N/A	N/A	N/A	N/A	N/A	N/A
276	Boron, dissolved		7440-42-8	N/A	N/A	N/A	N/A	N/A	N/A
277	Cobalt, dissolved		7440-48-4	N/A	N/A	N/A	N/A	N/A	N/A
278	Molybdenum, dissolved		7439-98-7	N/A	N/A	N/A	N/A	N/A	N/A
279	Uranium, dissolved		7440-61-1	N/A	N/A	N/A	N/A	N/A	N/A
280	Vanadium, dissolved		7440-62-2	N/A	N/A	N/A	N/A	N/A	N/A
281	Ra-226 and Ra-228 (pCi/l)			N/A	N/A	N/A	N/A	N/A	N/A
282	Strontium (pCi/l)			N/A	N/A	N/A	N/A	N/A	N/A
283	Tritium (pCi/l)			N/A	N/A	N/A	N/A	N/A	N/A
284	Gross Appha (pCi/l)			N/A	N/A	N/A	N/A	N/A	N/A
285	Asbestos (fibers/l)			N/A	N/A	N/A	N/A	N/A	N/A
286	Total Residual Chlorine		7782-50-5	11	19	N/A	N/A	11	7.333333333
287	Nitrate as N (mg/l)			N/A	N/A	N/A	N/A	N/A	N/A
288	Nitrite + Nitrate (mg/l)			N/A	N/A	N/A	N/A	N/A	N/A
289	METALS AND CYANIDE								
290	Antimony, dissolved (P)		7440-36-0	N/A	N/A	N/A	N/A	N/A	N/A
291	Arsenic, dissolved (P)		7440-38-2	N/A	N/A	N/A	N/A	N/A	N/A
292	Beryllium, dissolved		7440-41-7	N/A	N/A	N/A	N/A	N/A	N/A
293	Cadmium, dissolved		7440-43-9	N/A	N/A	N/A	N/A	N/A	N/A
294	Cadmium, Total		7440-43-9	N/A	N/A	N/A	N/A	N/A	N/A
295	Chromium, dissolved		18540-29-9	N/A	N/A	N/A	N/A	N/A	N/A
296	Copper, dissolved		7440-50-8	N/A	N/A	N/A	N/A	N/A	N/A
297	Lead, dissolved		7439-92-1	N/A	N/A	N/A	N/A	N/A	N/A
298	Mercury, dissolved		7439-97-6	N/A	N/A	N/A	N/A	N/A	N/A
299	Mercury, total		7439-97-6	N/A	N/A	N/A	N/A	N/A	N/A
300	Nickel, dissolved (P)		7440-02-0	N/A	N/A	N/A	N/A	N/A	N/A
301	Selenium, dissolved (P)		7782-49-2	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, dis (SO4 >500 mg/l)			N/A	N/A	N/A	N/A	N/A	N/A
303	Selenium, total recoverable		7782-49-2	N/A	N/A	N/A	N/A	N/A	N/A
304	Silver, dissolved		7440-22-4	N/A	N/A	N/A	N/A	N/A	N/A
305	Thallium, dissolved (P)		7440-28-0	N/A	N/A	N/A	N/A	N/A	N/A
306	Zinc, Dis. (P)		7440-66-6	N/A	88.0812188	N/A	N/A	146.706010	97.808046
307	Cyanide, dissolved		57-12-5	N/A	N/A	N/A	N/A	N/A	N/A
308	Cyanide, weak acid dissocia		57-12-5	N/A	N/A	N/A	N/A	N/A	N/A

SPREADSHEET USING **AVG**
EFFLUENT HARDNESS
(NEW DATA)
OUTFALL 13S

	N	O
32		1
33		0
40		2.6
41		88
42		0
43		0
44		13.4-27
45		6.9-8.9
46		1
47		0
271	Daily Max. Conc	Monthly Ave
272	ug/l	ug/l
273		
274	N/A	N/A
275	N/A	N/A
276	N/A	N/A
277	N/A	N/A
278	N/A	N/A
279	N/A	N/A
280	N/A	N/A
281	N/A	N/A
282	N/A	N/A
283	N/A	N/A
284	N/A	N/A
285	N/A	N/A
286	11	7.33333333
287	N/A	N/A
288	N/A	N/A
289		
290	N/A	N/A
291	N/A	N/A
292	N/A	N/A
293	N/A	N/A
294	N/A	N/A
295	N/A	N/A
296	N/A	N/A
297	N/A	N/A
298	N/A	N/A
299	N/A	N/A
300	N/A	N/A
301	N/A	N/A
302	N/A	N/A
303	N/A	N/A
304	N/A	N/A
305	N/A	N/A
306	N/A	N/A
307	N/A	N/A
308	N/A	N/A

SPREADSHEET USING **MAX**
EFFLUENT HARDNESS
(NEW DATA)
OUTFALL 13S

	N	O
32		1
33		0
40		2.6
41		95
42		0
43		0
44		13.4-27
45		6.9-8.9
46		1
47		0
271	Daily Max. Conc	Monthly Ave.
272	ug/l	ug/l
273		
274	N/A	N/A
275	N/A	N/A
276	N/A	N/A
277	N/A	N/A
278	N/A	N/A
279	N/A	N/A
280	N/A	N/A
281	N/A	N/A
282	N/A	N/A
283	N/A	N/A
284	N/A	N/A
285	N/A	N/A
286	11	7.333333333
287	N/A	N/A
288	N/A	N/A
289		
290	N/A	N/A
291	N/A	N/A
292	N/A	N/A
293	N/A	N/A
294	N/A	N/A
295	N/A	N/A
296	N/A	N/A
297	N/A	N/A
298	N/A	N/A
299	N/A	N/A
300	N/A	N/A
301	N/A	N/A
302	N/A	N/A
303	N/A	N/A
304	N/A	N/A
305	N/A	N/A
306	N/A	N/A
307	N/A	N/A
308	N/A	N/A

N/A = No RP with new hardness data.
Recommend no effluent limit in permit.

EN RE 4

ORIGINAL EPA SPREADSHEET USING AVG
SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 OUTFALL 03A022

	A	B	C	D	I	J	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no)				0					
40	Receiving Stream TSS (mg/l)				3.9		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and lake			
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)				13.4-27					
45	pH (Avg)				6.9-8.9					
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams			
47	Fraction of Critical Low Flow				0					
267	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Co	Monthly Ave.
268			CAS No.	STORET	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
269	Radioactivity, Nutrients, and Chlorine									
270	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A
271	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
272	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
273	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
274	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
275	Uranium, dissolved		7440-61-1	22708	N/A	N/A	N/A	N/A	N/A	N/A
276	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
277	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A
278	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A
279	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A
280	Gross Appha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A
281	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A
282	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A
283	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A
284	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A
285	METALS AND CYANIDE									
286	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
287	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
288	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
289	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
290	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
291	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
292	Copper, dissolved		7440-50-8	01042	N/A	6.60143078	N/A	N/A	14.30843321	9.607622138
293	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
294	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
295	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
296	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
297	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
298	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A
299	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
300	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
301	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
302	Zinc, Dis. (P)		7440-66-6	01090	N/A	N/A	N/A	N/A	N/A	N/A
303	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
304	Cyanide, weak acid dissociable		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

SPREADSHEET USING AVG
EFFLUENT HARDNESS
(NEW DATA)

OUTFALL 03A022

	I
	1
	0
	6.4
	84
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

SPREADSHEET AX
EFFLUENT HA SS
(NEW DATA)

OUTFALL 03A022

	I
	1
	0
	6.4
	99
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

N/A = No RP with new hardness data.
Recommend no effluent limit in permit.

ENCLOSURE 5

ORIGINAL EPA SPREADSHEET USING AVG SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 OUTFALL 03A027

	A / B	C	D	J	K	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)			1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no			1					
40	Receiving Stream TSS (mg/l)			2.6		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)			41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)			0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs)			0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)			13.4-27					
45	pH (Avg)			6.9-8.9					
46	Fraction of stream allowed for mixing (F)			1		Enter 1, if stream morphology data is not available or for intermittent streams.			
47	Fraction of Critical Low Flow			0					
272	POLLUTANTS			Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Conc.	Monthly Ave.
273		CAS No.	STORET	Wildlife Limits	Limits	Limits	Limits	ug/l	ug/l
274	Radioactivity, Nutrients, and Chlorine								
275	Aluminum, dissolved	7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A
276	Barium, dissolved	7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
277	Boron, dissolved	7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
278	Cobalt, dissolved	7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
279	Molybdenum, dissolved	7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
280	Uranium, dissolved	7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A
281	Vanadium, dissolved	7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
282	Ra-226 and Ra-228 (pCi/l)		11503	N/A	N/A	N/A	N/A	N/A	N/A
283	Strontium (pCi/l)		13501	N/A	N/A	N/A	N/A	N/A	N/A
284	Tritium (pCi/l)		04124	N/A	N/A	N/A	N/A	N/A	N/A
285	Gross Appha (pCi/l)		80029	N/A	N/A	N/A	N/A	N/A	N/A
286	Asbestos (fibers/l)			N/A	N/A	N/A	N/A	N/A	N/A
287	Total Residual Chlorine	7782-50-5	50060	11	19	11	N/A	11	7.333333333
288	Nitrate as N (mg/l)		00620	N/A	N/A	N/A	N/A	N/A	N/A
289	Nitrite + Nitrate (mg/l)		00630	N/A	N/A	N/A	N/A	N/A	N/A
290	METALS AND CYANIDE								
291	Antimony, dissolved (P)	7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
292	Arsenic, dissolved (P)	7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
293	Beryllium, dissolved	7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
294	Cadmium, dissolved	7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
295	Cadmium, Total	7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
296	Chromium, dissolved	18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
297	Copper, dissolved	7440-50-8	01042	N/A	N/A	N/A	N/A	N/A	N/A
298	Lead, dissolved	7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
299	Mercury, dissolved	7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
300	Mercury, total	7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
301	Nickel, dissolved (P)	7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, dissolved (P)	7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
303	Selenium, dis (SO4 >500 mg/l)		01145	N/A	N/A	N/A	N/A	N/A	N/A
304	Selenium, total recoverable	7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
305	Silver, dissolved	7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
306	Thallium, dissolved (P)	7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
307	Zinc, Dis. (P)	7440-66-6	01080	N/A	N/A	N/A	N/A	N/A	N/A
308	Cyanide, dissolved	57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
309	Cyanide, weak acid dissocia	57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

SPREADSHEET USING AVG EFFLUENT HARDNESS (NEW DATA)

OUTFALL 03A027

	J
	1
	1
	2.6
	110
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
11	7.333333333
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

SPREADSHEET USING MAX EFFLUENT HARDNESS (NEW DATA)

OUTFALL 03A027

	J
	1
	1
	2.6
	117
	0
	0
	13.4-27
	6.9-8.9
-	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
11	7.333333333
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

N/A = No RP with original hardness data. Recommend no reporting requirement in permit.

N/A = No RP with new hardness data. Recommend no reporting requirement in permit.

ORIGINAL EPA SPREADSHEET USING AVG
SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 **OUTFALL 03A028**

	A	B	C	D	J	K	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1					
33	Are chronic aquatic life criteria considered (1= yes, 0=n				0					
34	Are domestic water supply criteria considered (1= yes, (				0					
35	Are irrigation water supply criteria considered (1= yes, 0				0					
36	Livestock watering and wildlife habitat criteria applied to all streams									
37										
38	USGS Flow Station				USGS					
39	WQ Monitoring Station No.				SJR					
40	Receiving Stream TSS (mg/l)				2.8		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)				13.4-27					
45	pH (Avg)				6.9-8.9					
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams			
47	Fraction of Critical Low Flow				0					
271	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Co	Monthly Ave.
272			CAS No.	STORET	Wildlife Limi	Limits	Limits	Limits	ug/l	ug/l
273	Radioactivity, Nutrients, and Chlorine									
274	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A
275	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
276	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
277	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
278	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
279	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A
280	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
281	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A
282	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A
283	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A
284	Gross Appha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A
285	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A
286	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A
287	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A
288	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A
289	METALS AND CYANIDE									
290	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
291	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
292	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
293	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
294	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
295	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
296	Copper, dissolved		[illegible]	01040	N/A	[illegible]	N/A	N/A	[illegible]	[illegible] *
297	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
298	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
299	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
300	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
301	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A
303	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
304	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
305	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
306	Zinc, Dis. (P)		7440-66-6	01090	N/A	N/A	N/A	N/A	N/A	N/A
307	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
308	Cyanide, weak acid dissocia		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

* Draft Permit limits are 12.4 ug/L MAX and 8.3 ug/L AVG

SPREADSHEET USING AVG EFFLUENT HARDNESS (NEW DATA)
OUTFALL 03A028

	J
	1
	0
	0
	0
	USGS
	SJR
	2.8
	161
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	**O**
Daily Max. Conc	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
[illegible]	[illegible]
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

SPREADSHEET USING MAX EFFLUENT HARDNESS (NEW DATA)
OUTFALL 03A028

	J
	1
	0
	0
	0
	USGS
	SJR
	2.8
	201
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	**O**
Daily Max. Conc	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
[illegible]	[illegible]
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

N/A = No RP with new hardness data. Recommend no effluent limit in permit.

[illegible] = Still RP with new hardness data. Recommend using new effluent limits.

ENC… E 7

ORIGINAL EPA SPREADSHEET USING AVG SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 OUTFALL 03A130

	A	B	C	D	G	J	K	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)					1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no)					0					
40	Receiving Stream TSS (mg/l)					1.4		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)					41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)					0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs)					0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)					13.4-27					
45	pH (Avg)					6.9-8.9					
46	Fraction of stream allowed for mixing (F)					1		Enter 1, if stream morphology data is not available or for intermittent streams.			
47	Fraction of Critical Low Flow					0					
148	Cyanide, weak acid dissoci		57-12-5	00718	3.83	8.1579	8.1579	8.1579	8.1579	700	1E+100
271	POLLUTANTS				Irrigation	Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Co	Monthly Ave.
272			CAS No.	STORET	Limits	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
273	Radioactivity, Nutrients, and Chlorine										
274	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A	N/A
275	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
276	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A	N/A
277	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A	N/A
278	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A	N/A
279	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A	N/A
280	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A	N/A
281	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A	N/A
282	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A	N/A
283	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A	N/A
284	Gross Appha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A	N/A
285	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A	N/A
286	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A	N/A
287	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A	N/A
288	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A	N/A
289	METALS AND CYANIDE										
290	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A	N/A
291	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
292	Berylium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
293	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A	N/A
294	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A	N/A
295	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A	N/A
296	Copper, dissolved		7440-50-8	01040	N/A	N/A	8.60143878	N/A	N/A	12.38853401	8.257089341 *
297	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A	N/A
298	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A	N/A
299	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, dis (SO4 >500 mg/l)			01146	N/A	N/A	N/A	N/A	N/A	N/A	N/A
303	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A	N/A
304	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A	N/A
305	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A	N/A
306	Zinc, Dis. (P)		7440-66-6	01090	N/A	N/A	88.0812189	N/A	N/A	131.1741254	87.44941891
307	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A	N/A
308	Cyanide, weak acid dissocia		57-12-5	00718	N/A	5.2	N/A	N/A	N/A	5.2	3.466666667

* Draft Permit limits are 12.4 ug/L MAX and 8.3 ug/L AVG

SPREADSHEET USING AVG EFFLUENT HARDNESS AND NEW CYANIDE DATA (NEW DATA)

OUTFALL 03A130

		J
32		1
33		0
40		1.4
41		130
42		0
43		0
44		13.4-27
45		6.9-8.9
46		1
47		0
148 (CN)		0.85
	N	O
271	Daily Max. Co	Monthly Ave.
272	ug/l	ug/l
273		
274	N/A	N/A
275	N/A	N/A
276	N/A	N/A
277	N/A	N/A
278	N/A	N/A
279	N/A	N/A
280	N/A	N/A
281	N/A	N/A
282	N/A	N/A
283	N/A	N/A
284	N/A	N/A
285	N/A	N/A
286	N/A	N/A
287	N/A	N/A
288	N/A	N/A
289		
290	N/A	N/A
291	N/A	N/A
292	N/A	N/A
293	N/A	N/A
294	N/A	N/A
295	N/A	N/A
296	30.7402043	24.49380054
297	N/A	N/A
298	N/A	N/A
299	N/A	N/A
300	N/A	N/A
301	N/A	N/A
302	N/A	N/A
303	N/A	N/A
304	N/A	N/A
305	N/A	N/A
306	N/A	N/A
307	N/A	N/A
308 (CN)	N/A	N/A

SPREADSHEET USING MAX EFFLUENT HARDNESS (NEW DATA)

OUTFALL 03A130

		J
32		1
33		0
40		1.4
41		157
42		0
43		0
44		13.4-27
45		6.9-8.9
46		1
47		0
148		
	N	O
271	Daily Max. C	Monthly Ave.
272	ug/l	ug/l
273		
274	N/A	N/A
275	N/A	N/A
276	N/A	N/A
277	N/A	N/A
278	N/A	N/A
279	N/A	N/A
280	N/A	N/A
281	N/A	N/A
282	N/A	N/A
283	N/A	N/A
284	N/A	N/A
285	N/A	N/A
286	N/A	N/A
287	N/A	N/A
288	N/A	N/A
289		
290	N/A	N/A
291	N/A	N/A
292	N/A	N/A
293	N/A	N/A
294	N/A	N/A
295	N/A	N/A
296	43.8898878	29.2697282
297	N/A	N/A
298	N/A	N/A
299	N/A	N/A
300	N/A	N/A
301	N/A	N/A
302	N/A	N/A
303	N/A	N/A
304	N/A	N/A
305	N/A	N/A
306	N/A	N/A
307	N/A	N/A
308	N/A	N/A

N/A = No RP with new hardness data. Recommend no effluent limit in permit.

##.#### = Still RP with new hardness data. Recommend using new effluent limits.

ENCLOSURE 8

LOS ALAMOS NATIONAL LABORATORY
CYANIDE (CN) RESULTS FOR NPDES PERMIT RE-APPLICATION

FORM 2C Sampling March through June 2004					
CN (total) Method 335.3					
Outfall	**Result (ug/L)**	**Analytical Laboratory Qualifier**	**Additional Qualifier From Level 4**	**DL (ug/L)**	**RL (ug/L)**
03A027	2.14	J	none	1.72	5.00
03A048	1.79	J	none	1.72	5.00
03A113	1.73	J	none	1.72	5.00
03A130	3.83	J	NJ-	1.72	5.00
03A185	8.29	none	none	1.72	5.00

Additional Sampling February and March 2005					
CN (weak acid dissociable) Method 4500 CN-I					
Outfall	**Result (ug/L)**	**Analytical Laboratory Qualifier**	**Qualifier From Level 4 Validation**	**DL (ug/L)**	**RL (ug/L)**
03A027	4.63	J	none	1.14	5.00
03A048	1.56	J	none	1.14	5.00
03A113	ND	U	U	1.14	5.00
03A130	0.85	U	none	2.5	5.00
03A185	2.45	J	none	1.14	5.00

J = The associated numeric value is an estimated quantity.

U = The material was analyzed for, but was not detected above the DL.

NJ- = An estimated quantity with a suspected negative bias.

ENCL… .E 9

ORIGINAL EPA SPREADSHEET USING AVG SUPPLY WELL HARDNESS OF 41 mg/L	SPREADSHEET USING AVG EFFLUENT HARDNESS (NEW DATA)	SPREADSHEET USING MAX EFFLUENT HARDNESS (NEW DATA)

1 LANL NM0028355 OUTFALL 03A048 | OUTFALL 03A048 (AVG EFFLUENT HARDNESS) | OUTFALL 03A048 (MAX EFFLUENT HARDNESS)

	A	B	C	D	J	K	L	M	N	O	AVG:	J	MAX:	J
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1							1		1
33	Are chronic aquatic life criteria considered (1= yes, 0=no				0							0		0
40	Receiving Stream TSS (mg/l)				2		For intermittent stream, enter effluent TSS					2		2
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness					102		145
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and lake.					0		0
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data					0		0
44	Avg. Water Temperature (C)				13.4-27							13.4-27		13.4-27
45	pH (Avg)				6.9-8.9							6.9-8.9		6.9-8.9
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams.					1		1
47	Fraction of Critical Low Flow				0							0		0
267	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Con	Monthly Ave.	Daily Max. Conc.	Monthly Ave.	Daily Max. Conc.	Monthly Ave.
268			CAS No.	STORET	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
269	Radioactivity, Nutrients, and Chlorine													
270	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
271	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
272	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
273	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
274	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
275	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
276	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
277	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
278	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
279	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
280	Gross Alpha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
281	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
282	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
283	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
284	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
285	METALS AND CYANIDE													
286	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
287	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	0	14.20006082	9.472728644	14.20006082	9.472728644	14.20006082	9.472728644
288	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
289	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
290	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
291	Chromium, dissolved		16540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
292	Copper, dissolved		7440-50-8	01042	N/A	8.80143678	N/A	N/A	13.02641765	8.884278433 *	30.7441953	20.4961302	42.82536963	28.55023722
293	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
294	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
295	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
296	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
297	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
298	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
299	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302	Zinc, Dis. (P)		7440-66-6	01090	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
303	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
304	Cyanide, weak acid dissocial		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* Draft Permit limits are 12.4 ug/L MAX and 8.3 ug/L AVG

##.#### = Still RP with new hardness data. Recommend using new effluent limits.

= No change with new hardness data.

ENC ꝛE 10

ORIGINAL EPA SPREADSHEET USING AVG SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 **OUTFALL 158**

	A	B	C	D	J	K	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no)				0					
40	Receiving Stream TSS (mg/l)				2.1		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and take			
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)				13.4-27					
45	pH (Avg)				6.9-8.9					
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams			
47	Fraction of Critical Low Flow				0					
267	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Con	Monthly Ave.
268			CAS No.	STORET	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
269	**Radioactivity, Nutrients, and Chlorine**									
274	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A
275	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
276	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
277	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
278	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
279	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A
280	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
281	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A
282	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A
283	Tritium (pCi/l)			04124	20000	N/A	N/A	N/A	20000	13333.33333
284	Gross Appha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A
285	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A
286	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A
287	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A
288	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A
289	**METALS AND CYANIDE**									
290	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
291	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
292	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
293	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
294	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
295	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
296	Copper, dissolved		7440-50-8	01042	N/A	5.80143878	N/A	N/A	13.11865352	8.745769013 *
297	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
298	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
299	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
300	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
301	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A
303	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
304	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
305	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
306	Zinc, Dis. (P)		7440-66-6	01090	N/A	N/A	N/A	N/A	N/A	N/A
307	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
308	Cyanide, weak acid dissociable		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

SPREADSHEET USING AVG EFFLUENT HARDNESS (NEW DATA) OUTFALL 158

	J
	1
	0
	2.1
	59
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
20000	13333.33333
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
18.49506906	**12.32337036**
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

SPREADSHEET USING MAX EFFLUENT HARDNESS (NEW DATA) OUTFALL 158

	J
	1
	0
	2.1
	91
	0
	0
	13.4-27
	6.9-8.9
	1
	0
N	O
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
20000	13333.33333
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	**N/A**
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

* Draft Permit limits are **12.4** ug/L MAX and **8.3** ug/L AVG

##.#### = Still RP with new hardness data. Recommend using new effluent limits.

N/A = No RP with new hardness data. Recommend no effluent limit in permit.

ENCL. .E 11

ORIGINAL EPA SPREADSHEET USING AVG SUPPLY WELL HARDNESS OF 41 mg/L

1 LANL NM0028355 OUTFALL 03A160

	A	B	C	D	I	J	L	M	N	O
32	Are acute aquatic life criteria considered (1= yes, 0= no)				1					
33	Are chronic aquatic life criteria considered (1= yes, 0=no)				0					
40	Receiving Stream TSS (mg/l)				7		For intermittent stream, enter effluent TSS			
41	Receiving Stream Hardness (mg/l as CaCO3)				41		For intermittent stream, enter effluent Hardness			
42	Receiving Stream Critical Low Flow (4Q3) (cfs)				0		Enter "0" for intermittent stream and lake.			
43	Receiving Stream Harmonic Mean Flow (cfs)				0		Enter harmonic mean or modified harmonic mean flow data			
44	Avg. Water Temperature (C)				13.4-27					
45	pH (Avg)				6.9-8.9					
46	Fraction of stream allowed for mixing (F)				1		Enter 1, if stream morphology data is not available or for intermittent streams.			
47	Fraction of Critical Low Flow				0					
267	POLLUTANTS				Livestock or	Acute Fish	Chronic Fish	Human Health	Daily Max. Con	Monthly Ave.
268			CAS No.	STORET	Wildlife Limit	Limits	Limits	Limits	ug/l	ug/l
269	Radioactivity, Nutrients, and Chlorine									
273	Aluminum, dissolved		7429-90-5	01106	N/A	N/A	N/A	N/A	N/A	N/A
274	Barium, dissolved		7440-39-3	01005	N/A	N/A	N/A	N/A	N/A	N/A
275	Boron, dissolved		7440-42-8	01022	N/A	N/A	N/A	N/A	N/A	N/A
276	Cobalt, dissolved		7440-48-4	01037	N/A	N/A	N/A	N/A	N/A	N/A
277	Molybdenum, dissolved		7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A
278	Uranium, dissolved		7440-61-1	22706	N/A	N/A	N/A	N/A	N/A	N/A
279	Vanadium, dissolved		7440-62-2	01087	N/A	N/A	N/A	N/A	N/A	N/A
280	Ra-226 and Ra-228 (pCi/l)			11503	N/A	N/A	N/A	N/A	N/A	N/A
281	Strontium (pCi/l)			13501	N/A	N/A	N/A	N/A	N/A	N/A
282	Tritium (pCi/l)			04124	N/A	N/A	N/A	N/A	N/A	N/A
283	Gross Appha (pCi/l)			80029	N/A	N/A	N/A	N/A	N/A	N/A
284	Asbestos (fibers/l)				N/A	N/A	N/A	N/A	N/A	N/A
285	Total Residual Chlorine		7782-50-5	50060	N/A	N/A	N/A	N/A	N/A	N/A
286	Nitrate as N (mg/l)			00620	N/A	N/A	N/A	N/A	N/A	N/A
287	Nitrite + Nitrate (mg/l)			00630	N/A	N/A	N/A	N/A	N/A	N/A
288	METALS AND CYANIDE									
289	Antimony, dissolved (P)		7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A
290	Arsenic, dissolved (P)		7440-38-2	01000	N/A	N/A	N/A	N/A	N/A	N/A
291	Beryllium, dissolved		7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A
292	Cadmium, dissolved		7440-43-9	01025	N/A	N/A	N/A	N/A	N/A	N/A
293	Cadmium, Total		7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A
294	Chromium, dissolved		18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A
295	Copper, dissolved		7440-50-8	01042	N/A	6.80145678	N/A	N/A	15.80821773	10.53881182 *
296	Lead, dissolved		7439-92-1	01049	N/A	N/A	N/A	N/A	N/A	N/A
297	Mercury, dissolved		7439-97-6	71890	N/A	N/A	N/A	N/A	N/A	N/A
298	Mercury, total		7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A
299	Nickel, dissolved (P)		7440-02-0	01065	N/A	N/A	N/A	N/A	N/A	N/A
300	Selenium, dissolved (P)		7782-49-2	01145	N/A	N/A	N/A	N/A	N/A	N/A
301	Selenium, dis (SO4 >500 mg/l)			01145	N/A	N/A	N/A	N/A	N/A	N/A
302	Selenium, total recoverable		7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A
303	Silver, dissolved		7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A
304	Thallium, dissolved (P)		7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A
305	Zinc, Dis. (P)		7440-66-6	01090	N/A	86.0812188	N/A	N/A	178.4203095	116.046873
306	Cyanide, dissolved		57-12-5	00720	N/A	N/A	N/A	N/A	N/A	N/A
307	Cyanide, weak acid dissociat		57-12-5	00718	N/A	N/A	N/A	N/A	N/A	N/A

* Draft Permit limits are 12.4 ug/L MAX and 8.3 ug/L AVG

SPREADSHEET USING AVG EFFLUENT HARDNESS

OUTFALL 03A160

	J
	1
	0
	7
	88
	0
	0
	13.4-27
	6.9-8.9
	1
	0
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
22.46459087	21.64304056
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

SPREADSHEET USING MAX EFFLUENT HARDNESS

OUTFALL 03A160

	J
	1
	0
	7
	95
	0
	0
	13.4-27
	6.9-8.9
	1
	0
Daily Max. Conc.	Monthly Ave.
ug/l	ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
34.69226322	23.26160681
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

##.#### = Still RP with new hardness data. Recommend using new effluent limits.

ENCL(.RE 12

INTERFERENCES USING EPA METHODS 200.7 AND 200.8 FOR SELENIUM ANALYSIS FROM NPDES OUTFALLS COLLECTED IN FEBRUARY AND APRIL 2005

ENV-WQH January 28, 2006

Outfall	Sample Date	Date EPA Notified of Potential Exceedence	GEL Selenium Result ug/L 200.7 ICP-AES DL= 2.29 ug/L	WCAS Selenium Result ug/L ICP-MS (hydride generation prep) DL= 1.0 ug/L	SwRI Selenium Result ug/L AA gaseous hydride DL = 0.5 ug/L
03A027	2/10/2005	2/18/05	7.45	ND	Insufficient sample volume remaining
03A027	2/24/2005	3/3/05	12.5	ND	0.65
05A055	2/28/2005	3/10/05	6.82 (DL= 6.0ug/L)	ND	0.96
03A158	4/21/2005	5/3/05	6.33	ND	ND

ELEVATED SELENIUM RESULTS FROM NPDES OUTFALLS COLLECTED IN FEBRUARY 2005

ENV-WQH March 22, 2005

The following narrative describes the current status of investigating these potential permit exceedences:

The original Se exceedence was at outfall 03A027 (TA-3-2327 SCC Cooling Tower) from a discharge on February 10, 2005. No Se is present in the treatment chemicals used at this cooling tower. Preliminary information suggested that during the timeframe the sample was collected, a potential cause of the elevated result could be naturally occurring Se in dust and dirt entering the cooling tower due to construction activities nearby. WQH recently learned the biocide used in this cooling tower contains bromine, and as we discovered at the end of CY 2003, bromine is a positive interference for Se using EPA Method 200.8 (ICP-MS). During the investigation at the end of CY 2003, we used an alternate EPA approved method (Method 200.7 ICP-AES) for Se analysis when bromine was present with no exceedences being observed. Since that time, when bromine is known to be present in a sample matrix, we have used Method 200.7 to analyze for Se. To check for bromine interference, the initial sample was analyzed using both Method 200.7, and Method 200.8 with results of 7.45 ug/L and 5.04 ug/L respectively (NPDES permit limit = 5.0ug/L).

A repeat Se sample was collected at 03A027 on February 24, 2005, again using Method 200.7 and Method 200.8 with results of 12.5 ug/L and 6.61 ug/L respectively. Observations from a field visit to the cooling tower did not confirm the theory that dust and dirt were entering the cooling tower. Due to the fluctuating conductivity they have been encountering, operations and water treatment personnel at outfall 03A027 suggested sampling the water coming in to the SCC. A sample from the cooling tower basin was collected on March 4, 2005 and a sample of incoming water was collected at the SCC on March 9, 2005. At this point, Billy Turney was consulted and he suspected bromine was causing a positive interference in both methods. He suggested sending the first two samples that exceeded the permit limit to an alternate analytical laboratory (WCAS) that uses a special prep method (using hydride generation to introduce the sample into the ICP-MS).

Meanwhile, the results from a compliance sample collected at outfall 05A055 (HEWTF) on February 28, 2005 showed Se had also exceeded the permit limit with a result of 6.82 ug/L (Method 200.7). There is no indication that bromine is present in this waste stream.

Discussions with Bob Beers about the quality of water being supplied to the Laboratory indicated that during the month of February a "pump test" was being conducted at Well PM-4. All the water coming into the Laboratory during this test was from PM-4 and normally the Laboratory receives water from PM-2 and PM-5. These two wells were taken off-line for the pump test and remain off-line to measure re-charge. Historic data for PM-4 did not indicate elevated levels of Se (PM-4 last sampled in 2002). Bob did sample PM-4 on February 15, 2005 during the pump test and preliminary results from that effort showed Se at a concentration of 9.21 ug/L (SW846 Method 3005 ICP). The Laboratory supply water could have contributed to these elevated Se results from samples collected at the outfalls during February.

The results from the re-analyses by WCAS of the first two samples (Outfall 03A027) that exceeded the Se permit limit were Non-Detect for both. This confirms Dr. Turney's suspicion that bromine is a positive interference for both Method 200.7 and Method 200.8. The re-analysis result from the third sample that exceeded the Se permit limit (Outfall 05A055) was also Non-Detect. Dr. Turney suspects that the sample matrix from this outfall could have other chemical interferences with Method 200.7 and Method 200.8 from co-existing transition metals, namely iron (Fe), copper (Cu), and manganese (Mn).

Based on available information, Table 2 summarizes the compliance status of outfalls 03A027 and 05A055.

Table 2

Outfall	Date Sampled	GEL Result for Se (ug/L) Method 200.7	WCAS Result for Se (ug/L)	Se Permit Limit (ug/L)	Comments
03A027	2-10-05	7.45	ND	5.0	**No Exceedence** -Bromine interference
03A027	2-24-05	12.5	ND	5.0	**No Exceedence** -GEL result qualified as "U" -Bromine interference
03A027	3-11-05	2.43	ND	5.0	**No Exceedence** -GEL result < permit limit -WCAS result Non-Detect
05A055	2-28-05	6.82	ND	5.0	**No Exceedence** (pending final validation) -WCAS result Non-Detect

ENV-WQH is continuing the investigation and will provide additional information as it is received.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

EXHIBIT
EF

perm.

JUL 1 7 2007

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (7004 1160 0003 0356 7715)

Mr. Edwin L. Wilmot, Manager
National Nuclear Security Administrator
Los Alamos Site Office
Los Alamos, NM 87544

Re: NPDES Permit No. NM0028355
Notice of Final Permit Decision

Dear Mr. Wilmot:

The permit recently issued to Los Alamos National Laboratory contains several typographical errors. Following regulations listed at 40CFR122.63(a), the following minor permit modifications are made:

(1) Page 6 of Part I- The footnote (*7) is corrected to be (*6) for monitor of Daphnia pulex;
(2) Page 11 of Part I- Total zinc is added into Footnote (*3) for report; and
(3) Page 21 of Part I- Delete monitoring requirement for total zinc.

Per your request, following regulations listed at 40CFR122.63(c), the following compliance reporting requirements are modified:

(1) Part I.B.(2)(a)- Add option of end-of-pipe treatment to PCB's compliance schedule; and
(2) Part I.B.(3)- Change progress report date from 15th to 28th so that the report may be submitted with DMRs.

The following point source outfalls are deleted per your request, in accordance with regulations listed at 40CFR122.63(e)(2):

(1) Outfall 03A158.

The revised Part I with adjusted page numbers and page 14 of Part II are enclosed.

If you have any questions on any aspect of this minor permit modification, please feel free to contact the permit writer, Isaac Chen, by telephone at:214-665-7364, FAX:214-665-2191, or E-mail: chen.isaac@epa.gov.

Sincerely yours,

Willie Lane
Chief
Permits & Technical Section (6WQ-PP)

Enclosure(s)

cc w/Enclosure: New Mexico Environment Department
6EN-WC

PART I - REQUIREMENTS FOR NPDES PERMITS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL 001
Discharge Type: Continuous
Latitude 35°52'26"N, Longitude 106°19'09"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge Power Plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, R/O reject, floor and sink drains, and treated sanitary re-use to Sandia Canyon, in Segment Number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
TSS STORET: 00530	****	****	30	100
E. Coli (*1) STORET: 51040	****	****	Report	Report
E. Coli (*1) STORET: 51040	****	****	126 cfu/100 ml	410 cfu/100 ml
Total Residual Chlorine (*2) STORET: 50060	****	****	****	0.011
Total Aluminum (*3) STORET: 01105	****	****	Report	Report
Total Aluminum (*3) STORET: 01105	****	****	0.058	0.087
pH (Standard Units) (*4) STORET: 00400	Ranges from 6.0 to 9.0			
pH (Standard Units) (*4) STORET: 00400	Ranges from 6.6 to 8.8			
Temperature (*5) STORET: 00010	****	****	Report	Report
Temperature (*5) STORET: 00010	****	****	24°C	24°C

Total PCBs (*6) STORET: 39516	****	****	0.009 ug/l	0.014 ug/l
Total PCBs (*6) STORET: 39516	****	****	0.00064 ug/l(*7)	0.00064 ug/l(*7)

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	Continuous	Totalizer Record
TSS	1/Month	24-hr Composite
E. Coli	1/Week	Grab
Total Residual Chlorine	1/Week	Grab
Total Aluminum	1/Month	24-hr Composite
pH (Standard Units)	1/Week	Grab
Temperature	1/Week	Grab
Total PCBs	1/Year	24-hr Composite

WHOLE EFFLUENT TOXICITY TESTING

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS QUALITY (PERCENT % UNLESS STATED)	
	MONTHLY AVG MINIMUM	7-DAY MINIMUM
Whole Effluent Toxicity Testing (*8) (7-Day Static Renewal)		
Pimephales promelas	Report	Report
Ceriodaphnia dubia	Report	Report

Species Quality Reporting Units: Pass = 0, Fail = 1

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Whole Effluent Toxicity Testing (7-Day Static Renewal)		
Pimephales promelas	1/Year	24-Hr. Composite
Ceriodaphnia dubia	1/Year	24-Hr. Composite

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge from Outfall 001 (Latitude 35°52'26"N, Longitude 106°19'09"W).

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FOOTNOTES

*1 Logarithmic mean. Effluent limitations and monitoring requirements only apply when effluent from Outfall 13S is rerouted and discharged at Outfall 001.
The discharge shall meet the *E. coli* effluent limitations within six (6) months from the effective date of the permit.

*2 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 During the period beginning the effective date of the permit and lasting through three (3) years from the effective date, the concentrations of total aluminum shall be reported in the DMRs. During the period beginning the three years from the effective date through the expiration date of the permit, the discharge must meet the effluent limitations.

*4 During the period beginning the effective date of the permit and lasting through six (6) months from the effective date, the pH shall meet the range of 6.0 to 9.0. During the period beginning the six months from the effective date through the expiration date of the permit, the discharge shall meet the pH range of 6.6 to 8.8.

*5 During the period beginning the effective date of the permit and lasting through three (3) years from the effective date, the Temperature shall be reported in the DMRs. During the period beginning the three years from the effective date through the expiration date of the permit, the discharge must meet the effluent limitations.

*6 EPA published Method 1668 Revision A shall be used for total PCBs analysis.

*7 See Part I.B.2. Compliance Schedule for PCBs.

*8 The WET test should occur between November 1 and March 31 when most sensitive juvenile life forms are likely to be present in the receiving water and colder ambient temperatures might adversely affected treatment processes. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section H. Whole Effluent Toxicity (7-Day Chronic Testing).

OUTFALL 13S

Discharge Type: Continuous
Latitude 35°51'08"N, Longitude 106°16'33"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon in Segment Numbers 20.6.4.126 via outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A, or to Canada del Buey in Segment Numbers 20.6.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

CHEMICAL/PHYSICAL/BIOCHEMICAL

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
BOD5 (*1) STORET: 00310	75	112	30	45
BOD5 (*1) STORET: 00310	80	119	30	45
TSS (*1) STORET: 00530	75	112	30	45
TSS (*1) STORET: 00530	80	119	30	45
E. Coli (*2) STORET: 51040	****	****	Report	Report
E. Coli (*2) STORET: 51040	****	****	548 cfu/100 ml	2507 cfu/100 ml
Total Residual Chlorine (*3) STORET: 50060	****	****	****	0.011
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			
Total PCBs (*4) STORET: 39516	****	****	0.009 ug/l	0.014 ug/l
Total PCBs (*4) STORET: 39516	****	****	0.00064 ug/l(*5)	0.00064 ug/l(*5)

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	Continuous	Totalizer Record
BOD5	1/Month	24-Hr Composite
TSS	1/Month	24-Hr Composite
E. Coli Bacteria	1/Month	Grab
Total Residual Chlorine	1/Week	Grab
pH (Standard Units)	1/Week	Grab
Total PCBs	1/Year	24-Hr Composite

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/2 Years (*6)	3-hr Composite

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at the Parshall Flume following the chlorine contact chamber (Latitude 35°51'08"N, Longitude 106°16'33"W) and prior to discharge to either Canada del Buey at Latitude 35°51'07"N, Longitude 106°16'27"W, or into the effluent reuse line to Sandia Canyon at Latitude 35°52'29"N, Longitude 106°18'38"W, or other outfalls utilizing treated effluent in the Outfall 001 and Category 03A.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FOOTNOTES

*1 The monthly average and daily maximum loads of 75 and 112 lbs/day apply from the beginning the effective date of the permit and lasting until the average discharge rate has increased to 0.318 MGD through the addition of sanitary waste water from a residential subdivision located in Los Alamos County. LANL shall notify EPA Region 6 and NMED in writing two weeks prior to the addition of residential sanitary waste water to the TA-46 treatment plant. Mass loads of 80 and 119 lbs/day apply beginning the connection of sanitary waste water from a residential subdivision located in Los Alamos County lasting through the expiration date of the permit.

*2 Logarithmic mean. Effluent limitations and monitoring requirements only apply when discharge is made directly to Canada del Buey. The discharge shall meet the *E. coli* effluent limitations within six (6) months from the effective date of the permit. The discharge shall comply with the monitoring requirement and effluent limitations for E. coli if it discharges at other outfall.

*3 Effluent limitations and monitoring requirements only apply when discharge is made directly to Canada del Buey. The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*4 Effluent limitations and monitoring requirements only apply when discharge is made directly to Canada del Buey. EPA published Method 1668 Revision A shall be used. The permittee shall take efforts not to discharge PCBs contained effluent at Outfall 13S to Canada del Buey. PCBs contained effluent shall not be re-routed or reused, and/or discharged at other outfalls except Outfall 001. If the wastewater is discharge at other outfall, it shall comply with effluent limitations and monitoring requirements for PCBs.

*5 See Part I.B.2. Compliance Schedule for PCBs.

*6 When discharge is made directly to Canada del Buey. Take 1st sample in the 1st year of the permit and 2nd sample in the 3rd year of the permit. The WET test should occur between

November 1 and March 31. If discharges are not expected to occur during this sampling period, the test should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. Also see Part II, Section I. Whole Effluent Toxicity (48-hour Acute Testing).

OUTFALL 051 - Radioactive Liquid Waste Treatment Facility (TA-50)
Discharge Type: Intermittent
Latitude 35°51'54"N, Longitude 106°17'52"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated radioactive liquid waste to Mortandad Canyon in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report	Report	****	****
Chemical Oxygen Demand STORET: 00340	****	****	125	125
Total Suspended Solids STORET: 00530	****	****	30	45
Total Toxic Organics (*1) STORET: 78141	****	****	1.0	1.0
Ra 226+228 STORET: 11503	****	****	30 pCi/l	30 pCi/l
Total Chromium STORET: 01034	****	****	1.34	2.68
Total Lead STORET: 01051	****	****	0.423	0.524
Total Cadmium (*2) STORET: 01027	****	****	Report	Report
Total Mercury (*2) STORET: 71900	****	****	Report	Report
Total Nickel (*2) STORET: 01067	****	****	Report	Report

Total Copper (*3) STORET: 01042	****	****	Report	Report
Total Copper (*3) STORET: 01042	****	****	0.14 ug/l	0.2 ug/l
Total Zinc (*3) STORET: 01092	****	****	Report	Report
Total Zinc (*3) STORET: 01092	****	****	2.2 ug/l	3.3 ug/l
Total Residual Chlorine (*4) STORET: 50060	****	****	****	0.011
Total Selenium STORET: 01147	****	****	Report	Report
Perchlorate STORET: 61209	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			
Total PCBs STORET: 39516	****	****	Report	Report

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	Continuous	Record
Chemical Oxygen Demand	1/Month	Grab
Total Suspended Solids	1/Month	Grab
Total Toxic Organics	1/Month	Grab
Tritium	1/Year	Grab
Ra 226+228	1/Year	Grab
Total Chromium	1/Year	Grab
Total Lead	1/Year	Grab
Total Cadmium	1/Year	Grab
Total Mercury	1/Year	Grab
Total Nickel	1/Year	Grab
Total Copper	1/Month	Grab
Total Zinc	1/Month	Grab
Total Residual Chlorine	1/Week	Grab
Total Selenium	1/Year	Grab
Perchlorate	1/Year	Grab
Total PCBs	1/Year	Grab
pH (Standard Units)	1/Week	Grab

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/3 Months (*5)	3-hr Composite

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following the final treatment and prior to or at the point of discharge from TA-50-1 treatment plant (approximately at Latitude 35°51'54"N, Longitude 106°17'52"W)

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls

*2 Annual sample shall be taken for five (5) years until the expiration date.

*3 During the period beginning the effective date of the permit and lasting through three (3) years from the effective date, the concentration of total copper and total zinc shall the reported in the DMRs. During the period beginning the three years from the effective date through the expiration date of the permit, the discharge must meet the effluent limitations.

*4 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*5 Sampling frequency 1/3 Months for the 1st year of the permit. If the test passes, reduce the frequency to 1/6 Months for year 2 through year 5 of the permit. If any test fails, return frequency to 1/3 Months for remainder of the permit. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. Also, see Part II, Section I. Whole Effluent Toxicity (48-hour Acute Testing).

OUTFALL 05A055 - High Explosives Waste Water Treatment Plant (TA-16-1508)
Discharge Type: Intermittent
Latitude 35°50'49"N, Longitude 106°19'51"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge treated waste water from the high explosives waste water treatment facility to a tributary to Canon de Valle in segment number 20.6.4.128 of the Rio Grande Basin

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Chemical Oxygen Demand STORET: 00340	****	****	125	125
Total Suspended Solids STORET: 00530	****	****	30	45
Oil and Grease STORET: 00556	****	****	15	15
Total Toxic Organics (*1) STORET: 78141	****	****	1.0	1.0
Trinitrotoluene STORET: 81360	****	****	0.02	Report
Total RDX STORET: 81364	****	****	0.20	0.66
Perchlorate STORET: 61209	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Chemical Oxygen Demand	1/Quarter	Grab

Total Suspended Solids	1/Quarter	Grab
Oil and Grease	1/Quarter	Grab
Total Toxic Organics	1/Quarter	Grab
Trinitrotoluene	1/Quarter	Grab
Total RDX	2/Month (*2)	Grab
Perchlorate	1/Year	Grab
pH (Standard Units)	1/Week	Grab

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/5 Years (*3)	3-hr Composite

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge (Latitude 35°50'49"N, Longitude 106°19'51"W).

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS

"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 One sample should be taken before the 15th of the month and another taken after the 15th of the month.

*3 The WET test should occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, testing should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section I. Whole Effluent Toxicity (48-hour Acute Testing).

OUTFALLS 03A021, 03A022, and 03A181
Discharge Type: Intermittent
Outfall 03A021: Latitude 35°52'14"N, Longitude 106°19'11"W (TA3-29)
Outfall 03A022: Latitude 35°52'14"N, Longitude 106°19'01"W (TA3-2274)
Outfall 03A181: Latitude 35°51'50.8"N, Longitude 106°18'05"W (TA55-6)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Mortandad Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	****	0.011
Total Phosphorus STORET: 00665	****	****	20	40
Total Copper (*2) STORET: 01042	****	****	Report	Report
Total Copper (*3) STORET: 01042	****	****	0.019	0.028
Total Selenium STORET: 01147	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Total Suspended Solids	1/Quarter	Grab
Total Residual Chlorine	1/Week	Grab
Total Phosphorous	1/Quarter	Grab
Total Copper (*4)	1/Month	Grab

Total Selenium	1/Year	Grab
pH (Standard Units)	1/Week	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Apply to Outfall 03A022 only. Effective beginning the effective date and lasting until three (3) years after the effective date.

*3 Apply to Outfall 03A022 only. Effective beginning three (3) years after the effective date and lasting through the expiration date.

*4 Apply to Outfall 03A022 only.

OUTFALLS 03A027, 03A113, and 03A199
Discharge Type: Intermittent
03A027: Latitude 35°52'26"N, Longitude 106°19'08"W (TA3-285 & 2327)
Outfall 03A113: Latitude 35°52'03"N, Longitude 106°15'43"W
(TA-53-293, 294, 952, 1032, & 1038)
Outfall 03A199: Latitude 35°52'33"N, Longitude 106°19'19"W (TA3-1837)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.126 (from Outfall 03A027 and 199) and 20.6.4.128 (from Outfall 03A113) of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
E. Coli (*1) STORET: 51040	****	****	Report	Report
E. Coli (*1) STORET: 51040	****	****	548 cfu/100 ml	2507 cfu/100 ml
Total Residual Chlorine (*2) STORET: 50060	****	****	****	0.011
Total Phosphorus STORET: 00665	****	****	20	40
Total Copper (*3) STORET: 01042	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			
pH (Standard Units) (*4) STORET: 00400	Ranges from 6.6 to 8.8			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate

Total Suspended Solids	1/Quarter	Grab
E. Coli	1/Week	Grab
Total Residual Chlorine	1/Week	Grab
Total Phosphorous	1/Quarter	Grab
Total Copper (*3)	1/Year	Grab
pH (Standard Units)	1/Week	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 Logarithmic mean. Effluent limitations and monitoring requirements only apply at Outfall 03A027 when effluent from Outfall 13S is rerouted and discharged at Outfall 03A027. (Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs.)
The discharge shall meet the *E. coli* effluent limitations within six (6) months from the effective date of the permit.

*2 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 Apply to Outfall 03A027 during the term of this permit period only.

*4 Apply at Putfalls 03A027 and 199. During the period beginning the effective date of the permit and lasting through six (6) months from the effective date, the pH shall meet the range of 6.0 to 9.0. During the period beginning the six months from the effective date through the expiration date of the permit, the discharge shall meet the pH range of 6.6 to 8.8.

OUTFALLS 03A130 and 03A185
Discharge Type: Intermittent
Outfall 03A130: Latitude 35°50'19"N, Longitude 106°19'33"W (TA11-30)
Outfall 03A185: Latitude 35°50'00"N, Longitude 106°18'40"W (TA15-625 & 626)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Water Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	****	0.011
Total Phosphorus STORET: 00665	****	****	20	40
Total Copper (*2) STORET: 01042	****	****	Report	Report
Total Copper (*3) STORET: 01042	****	****	0.025	0.037
Total Cyanide (*4) STORET: 00720	****	****	Report	Report
Total Cyanide (*5) STORET: 00720	****	****	3.5 ug/l	5.2 ug/l
Total Selenium STORET: 01147	****	****	Report	Report
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Total Suspended Solids	1/Quarter	Grab
Total Residual Chlorine	1/Week	Grab
Total Phosphorous	1/Quarter	Grab
Total Copper	1/Month	Grab
Total Cyanide	1/Month	Grab
Total Selenium	1/Year	Grab
pH (Standard Units)	1/Week	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO-DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Effective beginning the effective date and lasting until three (3) years from the effective date these requirements apply at Outfall 03A130 only.

*3 Effective beginning three (3) years after the effective date and lasting through the expiration date these requirements apply at Outfall 03A130 only.

*4 Effective beginning the effective date and lasting until three (3) years from the effective date.

*5 Effective beginning three (3) years after the effective date and lasting through the expiration date.

OUTFALLS 03A048
Discharge Type: Intermittent
03A048: Latitude 35°52'11"N, Longitude 106°15'45"W (TA-53-964 & 979)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Los Alamos Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	****	0.011
Total Phosphorus STORET: 00665	****	****	20	40
Total Arsenic (*2) STORET: 01002	****	****	Report	Report
Total Arsenic (*3) STORET: 01002	****	****	0.01	0.014
Total Copper (*4) STORET: 01042	****	****	Report	Report
Total Copper (*5) STORET: 01042	****	****	0.021	0.031
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Total Suspended Solids	1/Quarter	Grab
Total Residual Chlorine	1/Week	Grab
Total Phosphorous	1/Quarter	Grab
Total Arsenic	1/Month	Grab
Total Copper	1/Month	Grab
Total Cyanide	1/Month	Grab
pH (Standard Units)	1/Week	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Effective beginning the effective date and lasting until three (3) years from the effective date.

*3 Effective beginning three (3) years after the effective date and lasting through the expiration date.

*4 Effective beginning the effective date and lasting until three (3) years from the effective date.

*5 Effective beginning three (3) years after the effective date and lasting through the expiration.

OUTFALLS 03A160
Discharge Type: Intermittent
Outfall 03A160: Latitude 35°51'47"N, Longitude 106°17'49"W (TA35-124)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to Ten Site Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow STORET: 50050	Report MGD	Report MGD	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	****	0.011
Total Phosphorus STORET: 00665	****	****	20	40
Total Copper (*2) STORET: 01042	****	****	Report	Report
Total Copper (*3) STORET: 01042	****	****	0.022	0.032
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Total Suspended Solids	1/Quarter	Grab
Total Residual Chlorine	1/Week	Grab
Total Phosphorous	1/Quarter	Grab
Total Copper	1/Month	Grab
pH (Standard Units)	1/Week	Grab

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS
"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Effective beginning the effective date and lasting until three (3) years from the effective date.

*3 Effective beginning three (3) years after the effective date and lasting through the expiration date.

OUTFALLS 03A021, 022, 048, 113, 130, 160, 181, and 185
Discharge Type: Intermittent

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to waters in segment number 20.6.4.128 of the Rio Grande Basin.

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal) (*1)		
Daphnia pulex	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/5 Years	3-hr Composite

(*1) The WET test should occur between November 1 and March 31 when most sensitive juvenile life forms are likely to be present in the receiving water and colder ambient temperatures might adversely affected treatment processes. If no discharge occurs or is expected during this period, the test shall occur as soon as possible.

Critical dilution of 100% (with a dilution series of 32%, 42%, 56%, 75%, and 100%) applies to Outfall(s) 03A021, 022, 048, 113, 130, 160, 181, and 185. Also see Part II. Section I. Whole Effluent Toxicity (48-Hr Acute Testing).

If the permittee certifies that discharges from the above outfalls have passed through similar operation and treatment and effluents are similar in nature, the testing result from one representative sample at Outfall 03A130 may be reported for all other outfalls. If Outfall 03A130 sample does not represent all 03A outfalls, the permittee may select additional representative outfalls for sampling.

OUTFALLS 03A027
Discharge Type: Intermittent

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to waters in segment number 20.6.4.126 of the Rio Grande Basin.

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal) (*1)		
Daphnia pulex	Report	Report
Pimephales promelas	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/5 Years	3-hr Composite
Pimephales promelas	1/5 Years	3-hr Composite

(*1) Critical dilution of 80% (with a dilution series of 25%, 34%, 45%, 60%, and 80%) applies to Outfall 03A027. Also see Part II. Section I. Whole Effluent Toxicity (48-Hr Acute Testing).

The WET test should occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, the test should occur as soon as possible.

OUTFALLS 03A199
Discharge Type: Intermittent

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge cooling tower blowdown and other wastewater to waters in segment number 20.6.4.126 of the Rio Grande Basin.

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (7-Day Static Renewal) (*1)		
Ceriodaphnia dubia	Report	Report
Pimephales promelas	Report	Report

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (7-Day Static Renewal)		
Ceriodaphnia dubia	1/5 Years	3-hr Composite
Pimephales promelas	1/5 Years	3-hr Composite

(*1) Critical dilution of 35% (with a dilution series of 15%, 20%, 26%, 35%, and 47%) applies to Outfall 03A199. See Part II. Section H. Whole Effluent Toxicity (7-Day Chronic Testing).

The WET test shall occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, the test should occur as soon as possible.

OUTFALL 02A129 (TA-21-357)
Discharge Type: Intermittent
Latitude 35°52'32"N, Longitude 106°16'31"W

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted),

the permittee is authorized to discharge boiler blowdown, water softener waste water, and once through cooling water to Los Alamos Canyon, in Segment Number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

PARAMETERS/STORET CODES	DISCHARGE LIMITATIONS/REPORTING REQUIREMENTS			
	QUANTITY/LOADING (LBS/DAY UNLESS STATED)		QUALITY/CONCENTRATION (mg/L UNLESS STATED)	
	MONTHLY AVG	DAILY MAX	MONTHLY AVG	DAILY MAX
Flow (MGD) STORET: 50050	Report	Report	****	****
Total Suspended Solids STORET: 00530	****	****	30	100
Total Residual Chlorine (*1) STORET: 50060	****	****	****	0.011
Total Iron STORET: 10145	****	****	10	40
Total Phosphorus STORET: 00665	****	****	20	40
Sulfite (as SO_3) STORET: 00740	****	****	35	70
Total Copper (*2) STORET: 01042	****	****	Report	Report
Total Copper (*2) STORET: 01042	****	****	1.6 ug/l	2.4 ug/l
pH (Standard Units) STORET: 00400	Ranges from 6.0 to 9.0			

PARAMETERS/STORET CODES	MONITORING REQUIREMENTS	
	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	1/Day	Estimate
Total Suspended Solids	1/Quarter	Grab
Total Residual Chlorine	1/Week	Grab
Total Iron	1/Quarter	Grab

Total Phosphorous	1/Quarter	Grab
Sulfite (as SO_3)	1/Quarter	Grab
Total Copper	1/Month	Grab
pH (Standard Units)	1/Week	Grab

EFFLUENT CHARACTERISTIC	DISCHARGE MONITORING	
	30-Day Avg Min.	48-Hr. Min.
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	REPORT	REPORT

EFFLUENT CHARACTERISTIC	MONITORING REQUIREMENTS	
	Frequency	Type
Whole Effluent Toxicity Testing (48 Hr. Static Renewal)		
Daphnia pulex	1/5 Years (*3)	3-hr Composite

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Following final treatment and prior to or at the discharge point (Latitude 35°52'32"N, Longitude 106°16'31"W).

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS

"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

FOOTNOTES

*1 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 During the period beginning the effective date of the permit and lasting through three (3) years from the effective date, the concentration of total copper shall be reported in the DMRs. During the period beginning the three years from the effective date through the expiration date of the permit, the discharge must meet the effluent limitations.

*3 The WET test shall occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, the test should occur as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section I. for 48-hour Acute WET Testing.

B. SCHEDULE OF COMPLIANCE

1. The permittee shall comply with the following schedule of activities for the attainment of state water quality standards-based final effluent limitations for

Total Arsenic	Outfall 03A048
Total Aluminum	Outfall 001
Total Copper	Outfalls 02A129, 03A022, 03A048, 03A130, 03A158, 03A160, and 051
Total Zinc	Outfalls 051
Total Cyanide	Outfalls 03A130 and 03A185
Temperature	Outfall 001

a. Determine exceedance cause(s) no later than twelve (12) months from the effective date of the permit;
b. Develop control options no later than eighteen (18) months from the effective date of the permit; and
c. Implement corrective action and attain final effluent limitations no later than three (3) years from the effective date of the permit.

2. The permittee shall use Method 1668A beginning the effective date of the permit and comply with the following schedule of activities for the attainment of state water quality standards-based final effluent limitations for PCBs:

a. Identify all possible PCBs causes/sources or end-of-pipe treatment technologies no later eighteen (18) months from the effective date of the permit;
b. Develop the site specific MQL for PCBs for Method 1668A no later than twelve (12) months from the effective date of the permit;
c. Submit a source/cause remediation plan or treatment plan to EPA R6 NPDES Programs Branch (6WQ-P) for approval and send a copy to NMED SWQB no later than twenty-four (24) months from the effective date of the permit;
d. Start implementing corrective actions no later than six (6) months after EPA approves, in part or in whole, the source/cause remediation plan and schedules; and
e. Complete corrective actions and comply with final effluent limitations per EPA approved schedule or one (1) day before the expiration date of the permit, whichever comes first.

3. The permittee shall submit quarterly progress reports in accordance with the following schedule. The requirement to submit quarterly progress reports shall expire when the discharge complies with final effluent limitations.

PROGRESS REPORT DATE
January 28, April 28, July 28, and October 28

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the state agency.

e. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

I. WHOLE EFFLUENT TOXICITY TESTING (48-HOUR ACUTE NOEC FRESHWATER)

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S): 13S, 051, 02A129, 05A055, 03A027, and 03A021, 022, 048, 113, 130, 160, 181 and 185.

REPORTED ON DMR AS FINAL OUTFALL: Same as above outfalls

CRITICAL DILUTION (%): Defined at PART I.

EFFLUENT DILUTION SERIES (%): Defined at PART I.

COMPOSITE SAMPLE TYPE: Defined at PART I

TEST SPECIES/METHODS: Defined at PART I / 40 CFR Part 136

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA/600/4-90/027F, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

Pimephales promelas (Fathead minnow) acute static renewal 48-hour definitive toxicity test using EPA/600/4-90/027F, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

ATTACHMENT 1

2/2/99

EXHIBIT
GG

received
2/4/99 TMS

State of New Mexico
ENVIRONMENT DEPARTMENT
Surface Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-0187

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

February 2, 1999

CERTIFIED MAIL - Return Receipt Requested

Steven Rae
ESH-18, Water Quality and Hydrology Group
Los Alamos National Laboratory, MS K497
Los Alamos, NM 87545

RE: LANL's NPDES Permit Reapplication (NM0028355): NMED - SWQB Review Comments

Dear Mr. Rae,

The New Mexico Environment Department Surface Water Quality Bureau (NMED-SWQB) has completed its **cursory review** of the Los Alamos National Laboratory's (LANL) NPDES permit reapplication (NM0028355). Enclosed is a list of our preliminary concerns. For your convenience, items of similar nature are grouped together. In order to further facilitate our review of the permit application, within 30 days of the receipt of this letter, LANL is requested to meet with NMED-SWQB to discuss the issues defined in this letter.

Please feel free to call Joseph Archuleta or Barbara Hoditschek at (505)-827-2933 to arrange for this meeting.
Your cooperation is appreciated.

Sincerely,

Glenn Saums
Program Manager
Point Source Regulation Section

cc: Scott Wilson, EPA, Region 6
Mike Saladen, ESH-18

16695

1. Septic Tanks/Holding Tanks and Sumps

- Appendix O contains a list of Septic/Holding Tanks. However, it is not clear whether this list is complete.(e.g. no sumps are included). Appendix O also does not identify the exact location or number of the septic/holding tanks and sumps, nor does it contain the pumping schedule associated with these structures. In addition, a discussion concerning the relevance (e.g. do the tanks, sumps, and TA-21 meet the WAC for volume pumped and constituents of concern such as hazard and radioactive waste)and rationale for continuing to use these septic/holding tanks, and sumps. Also, a description of how they relate to the SWCS plant would be helpful.

- TA-21, an old wastewater treatment plant, is being used as a holding tank, but is not listed in Appendix O. Does this omission indicate that the use of TA-21 will be terminated? If it was meant to be included as part of the application, please include a discussion of its intended use (e.g. list buildings discharging to TA-21). Also, list appropriate information about it on the Appendix O and Appendix L maps.

- The Appendix L map does not reflect the location of the 48 septic/holding tanks, 42 lift stations, and sumps. This information would be useful. Also, this map (Appendix L) still indicates TA-21 as an operational wastewater treatment plant. Please include the current status of TA-21 on the map.

- Identify all sumps associated with outfalls that receive storm water.

2. Flow and Impact to RCRA (PRS's)

- Please include on the revised map of the outfalls (Appendix F), all SWMU's located above and below the outfalls proposed for permit status. Also indicate on this map which outfalls receive storm water flow directly, or through collection systems (such as sumps) and at what volumes.

- Appendix T is a map that indicates all RCRA permitted sites. Please define which of these sites are currently classified as RCRA interim status sites? Also, indicate on this map any NPDES outfalls associated with these designated RCRA sites.

- The reapplication indicates some outfalls receive high amounts of flow (e.g., 001 and 051). High amounts of flow from outfalls may be causing erosion and/or impacting RCRA SWMUs located downstream. NMED-SWQB requests LANL address this issue by discussing with all facility managers utilizing outfalls, the importance of managing outfall flows through streamlining and/or modifying process management at the facility.

- DMR reports for NPDES outfall 051 indicate that problems may be occurring with the Total Toxic Organics (TTO) (e.g. results of 2 of 111 contributors to TTO were qualified as estimated under laboratory QA/QC methods). It is not clear as to what this means (e.g. which 2 of the 111 contributors are involved). In addition, identify the laboratory used and explain what is meant by "estimated under laboratory QA/QC. NMED also asks that LANL begin reporting which constituents are elevated when TTO is qualified as estimated under laboratory QA/QC methods.

- Barbara Hoditschek, on the tour of TA-50 conducted on October 29, 1998, was told that Investigative Derived Waste (IDW) was being received at TA-50. A notice of change of condition for outfall 051 reflects this change however, was not received or found in the reapplication. Please provide NMED-SWQB with a copy of this change of condition.

3. 13S Outfall Issues

- During NMED's site visit with Scott Wilson of EPA, a liquid of unknown source and quantity was observed in the outfall 13S(a) sump. NMED had been informed during regular NPDES inspections that this outfall was not in use. It was obvious, however, from observation of the residual deposits above the drain line that the liquid in the sump had discharged through the sump drain and out the 13S(a) outfall. Please, explain how future discharges will be prevented and/or eliminated. If 13S(a) is intended to be used please submit a change to the reapplication.

- According to Mike Saladen, the 13S(b) outfall had been removed from the permit, but has not yet been plugged. Please indicate if and when it will be plugged. Also, please list any other NPDES outfalls that have been removed from the permit, but not plugged. Attach any schedule that may relate to this issue.

- The 13S outfall category is not clearly represented in the application. For example, a discrepancy exists regarding 13S, 13S(a), and 13S(b). Appendix F and Appendix C do not consistently reflect which outfalls exist. Also, the 13S(a) and 13S(b) outfalls are not listed as part of the application. Please modify and provide new information to the application which address these issues.

4. **Representative Sampling**

- Please clarify in the application, how sampling at outfalls 13s and 001 would be representative sampling.

5. **LANL Internal Outfall Issues**

- NMED-SWQB has seen several instances in the permit application which indicate potential internal outfalls may exist (e.g. effluent from TA-50, Room 60, is being blended into TA-50 effluent to be discharged to outfall 051). NMED considers internal outfalls as a source of potential future problems. Therefore, NMED-SWQB is requesting LANL evaluate all proposed outfalls and clearly identify which may fall under "internal outfalls" as characterized according to 40 CFR (h) (1 and 2).

6. **HE Plant**

- Please provide NMED with a list and/or characterization of the HE/organic pollutants being introduced into the TA-16 plant. NMED-SWQB also would like to have a copy of the WAC for this facility.

- During a site visit of LANL with Scott Wilson of EPA, Barbara Hoditschek was told that the old TA-16 plant was to remain in service as a "standby plant". NMED-SWQB requests information describing what factors would trigger the use of the old TA-16 plant as a "standby" plant. Will the effluent from the old plant be comparable in quality to that of the new plant? How and when will the effluent be tested when the old plant is used?

- In the application, Appendix V, page 2, 2nd paragraph, the following is stated, "The EA compares the impacts of the proposed action with those of continuing to operate the existing temporary wastewater treatment facility without making any modifications to HE operations or reducing HE wastewater discharges (the "no action" alternative). Under this alternative, it is anticipated that HE wastewater discharges would periodically violate existing and future EPA discharge standards". Explain how LANL proposes to correct this situation at the old plant?

7. **Outfalls not in use**

- It was noted during a DMR review, that some outfalls have not been sampled for several years (e.g 05A-097, 03A-040, 03A-024,03A-160,04A-118 etc.). This seems to indicate they are also not being used. Please explain why no samples were taken, and why these outfalls should remain on the permit? Also identify any other outfalls which are not being used, but still remain on the application.

8. Old permit issues included in this reapplication

- In the reapplication, (Volume 1, page 1, paragraph 5), LANL indicates that the previous applications and other documents will be used as supporting documents. NMED requests that LANL provide citations and a copy of all documents that will be used as part of this application.

- Volume I, page 5, 2nd paragraph of the reapplication states, "Currently, designated State Water Quality Standards do not exist for the intermittent drainage's located with in the laboratory boundaries, only for the Rio Grande itself". NMED-SWQB disagrees with this statement. While there are no designated uses specified in subpart II of the current New Mexico Standards for Interstate and Intrastate Streams (20 NMAC 6.1), designated uses are specified in § 1105.A of the standards. Further, existing and attainable use will need to be considered in review of this permit application.

9. Transfer of wells to Los Alamos County

- According to Scott Wilson (EPA), the transferred wells indicated in the lease, and proposed for removal from LANL's permit, will be removed by EPA when they receive an application from Los Alamos County. Describe how DOE/LANL will assure that the county submits this application since the lease agreement itself does not set a timeline for submittal.

- Appendix C needs to be revised as per the letter of September 14, 1998, which reflects the water system transfer. Outfalls, 03A-040, 3A-045, and 06A-106 are pending outfalls that were not covered in Volume 1 of the reapplication. Please provide the necessary information. Also provide the following exhibits indicated as part of the lease, but which were provided in the reapplication: A, B, and D through H. In addition, please identify SWMUs found above and below all wells and indicate these on the system map (exhibit C of the lease).

10. NOI Potable Water issues

- The potable water Notice of Intent (NOI) in the application should be addressed as a state WQCC issue and not a federal NPDES issue. It is suggested that it be removed from the reapplication.

11. NEPA

- The reapplication states that NEPA documents were written for outfalls which were removed from the NPDES application. Does DOE plan to submit a NEPA for the remaining outfalls? If not, please explain.

12. Outfalls

- NMED-SWQB requests LANL provide a schedule for any proposed "future" outfall elimination.

- Has LANL addressed all outfalls associated with arsenic problems (e.g. all 03A outfalls proposed in the application)? Please provide information clarifying this issue. Identify any outfalls that still have arsenic problems, and indicate when the problem will be resolved.

- NMED-SWQB requests that outfalls associated with cooling towers be monitored for chromium 6(Cr6). Data from samples collected from Sandia wetlands have found to contain high levels of Chromium (4,000 ppm). This may imply that the high volume of cooling tower water being discharged from outfall 001 may have contained Cr6.

- Identify all outfalls (permitted and closed) which were associated with the 10 old wastewater treatment plants. What volumes of storm water have/do they receive?

13. WAC

- How will LANL ensure that the WAC is properly implemented? Describe the procedure/process used to assure compliance with the WAC. When will EPA or NMED-SWQB be notified if the WAC is violated?

- NMED has received some, but not all, WACs and the Waste Management Policy. Comments are not included in this letter, but will be addressed under separate cover.

- NMED would appreciate further information regarding the composition of the SWSC task force (e.g., what groups are represented). We believe inclusion of this information would be beneficial.

14. Miscellaneous

- No form 2C was included in the reapplication as indicated per Volume 1 page 12 of the reapplication.

- Please provide a copy or explanation of the NPDES sampling protocol.

- Appendix M (Sludge Handling Procedure) does not address current sludge disposal practices (e.g. language in the application states that LANL will dispose of sludge pursuant to TOSCA regulations). NMED also requests the following information regarding this disposal be provided during the life of the permit: volumes disposed, PCB analysis associated with those volumes, and location of disposal site.

- Please provide information concerning testing results and disposal volumes of grit and screenings. Also, provide language in the reapplication indicating LANL's commitment to provide this information in the future.

- As indicated on pages 5-7 of the reapplication, "The regional aquifer of the Los Alamos area occurs at the depth of 1200 ft along the western edge of the plateau, and 600 ft along the eastern edge". Please provide information clarifying if the distance provided to the regional aquifer is measured from a mesa top or canyon bottom. Also, since LANL has defined the depth of the regional aquifer it would be appropriate to address the depth to all alluvial, intermediate perched or regional ground water occurrences and this relates to NPDES outfall discharges.

- Please describe the QA/QC protocols that LANL uses at it's internal laboratory (the lab which provides the information for the Environmental Surveillance report). Also, provide information that all other laboratories that are/were used employ adequate QA/QC procedures.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

EXHIBIT
HH

OCT 13 1999

REPLY TO: 6WQ-P

Mr. David A. Gurule, P.E., Area Manager
Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Re: NPDES Permit No. NM0028355 - University of Calif. and Department of Energy

Dear Mr. Gurule:

In accordance with your request of September 16, 1999, you are hereby notified that we have eliminated the following outfalls from your National Pollutant Discharge Elimination System (NPDES) permit:

04A118	04A164	04A172
04A161	04A165	04A177
04A163	04A166	04A186

As indicated by the executed lease agreement with the Los Alamos Water Supply System, these water wells have been transferred to the Los Alamos Water Supply System which have now submitted an Application No. NM0030431 for coverage of the wells.

Should you again propose to discharge any pollutants to the waters of the United States from this outfall or make other modifications to your permit, it may be necessary to file a new application at least 180 days in advance of the proposed discharge. Any permit issued as a result of such reapplication will contain conditions and limitations consistent with the situation, and the law and the regulations in effect at the time of reissuance, irrespective of any previously issued permit.

If you have any questions, please contact Wilma Turner at the above address or telephone (214) 665-7516.

Sincerely yours,

Jack V. Ferguson, P.E.
Chief
NPDES Branch

cc: New Mexico Environment Department

Mr. Mike Saladen, Management Contractor for Operation
University of California
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

RECEIVED
OCT 18 1999
SURFACE WATER
QUALITY BUREAU

State of New Mexico
ENVIRONMENT DEPARTMENT
DOE Oversight Bureau
1183 Diamond Drive, Suite B MS M894
Los Alamos, New Mexico 87544
(505) 661-2670 FAX (505) 661-4958
www.nmenv.state.nm.us

EXHIBIT
II

SUSANA MARTINEZ
GOVERNOR

JOHN A. SANCHEZ
LIEUTENANT GOVERNOR

DAVID MARTIN
SECRETARY

RAJ SOLOMON, P.E.
DEPUTY SECRETARY

June 2, 2011

Jeffrey M. Casalina
Environmental Projects Office (EPO)
U.S Department of Energy
National Nuclear Security Administration Los Alamos Site Office
3747 West Jemez Road, MS A316
Los Alamos, NM 87544

SUBJECT: DOE Oversight Bureau (DOE OB) Inspection Observations and Suggestions for Deletion National Pollution Discharge Elimination System (NPDES) Outfall(s) from LANLs Current NPDES Permit Number NM0028355 issued by Region 6

Dear Mr. Casalina:

Previous to completion of these suggestions for outfall deletion from the current Environmental Protection Agency (EPA) NPDES permit, DOE Oversight Bureau staff and Marc Bailey from LANL/LANS Water Quality/RCRA staff visited NPDES discharge locations listed below in order to provide for the verification and suggestion for deletion of these outfalls(s) from the current NPDES permit under LANL's Reduction of Outfall Program.

- On November 17, 2010, TA-3, Building 357 (CMR Air Washers), Outfall 03A021
- On April 7, 2011, TA-15, Building 312 (DARHT Cooling Tower), Outfall 03A185
- On April 7, 2011, TA-21, Steam Plant Boiler Blowdown, Outfall 02A129, and
- On April 4, 2011, TA-11 (Cooling Tower), Outfall 03A130

All sites mentioned above were visited and verified for suggestion of closure.

Observations:

Outfall 03A021, TA-3, Building 357, Chemistry, and Metallurgy Building (CMR):

The air washers for this system have not supplied water to this outfall since 2007. In the spring of 2008 (air washers are used seasonally), the CMR Operations Group began operating the air washers in a "no blowdown" configuration. In addition, discharges from the CMR cooling system were re-routed from Outfall 03A021 to the TA-46 Sanitary Wastewater System (SWWS) plant for emergency use only and/or are operating in a "closed-loop" system with final re-pluming of the system completed on May 10, 2010.

Outfall 03A185, TA-15, Building 312 (Dual Axis Radiographic Hydrodynamic Test facility [DARHT] Cooling Tower):

The blowdown and overflow on this system was reconfigured to send all discharges from the cooling towers to the sanitary collection system at TA-46 Sanitary Wastewater System (SWWS) plant in July of 2010. In the reconfiguration, the overflow pipe (PVC) was re-routed to the uphill end of the corrugated metal pipe (CMP) on the north side of the building. Before this reconfiguration was completed, this discharge line went through the CMP where it day-lighted at the downhill end as Outfall 03A185.

During construction, the PVC line was cut at the uphill end of the CMP and the resulting isolated PVC was pulled several feet at the downhill end of the CMP, in order to allow capping of the blowdown pipe and allowing it to be abandoned in place. In addition, the overflow line was exposed and tied into the new line to the recently constructed nearby lift station. In the post-construction configuration, the blowdown exits the DARHT building on the north side as before, but then flows through the old overflow line and back to the south and to the new lift station. The overflow line now flows directly into the new lift station line and then to the line that is tied into the TA-46 SWWS plant.

Outfall 02A129, TA-21, Steam Plant Boiler Blowdown:

Decommissioning and demolition of the TA-21 Steam Plant began on August 24, 2007. The final discharge from the holding tank occurred on September 20, 2007. All piping leading into and out of this outfall has been either been cut or disconnected, followed by capping.

Outfall 03A130, TA-11, Building 30 (Cooling Tower):

During this inspection DOE Oversight Bureau staff was informed that several funding requests are in process to replace the old water-cooled equipment at TA-11, Building 30, with new equipment and closed loop chiller system, eliminating the need for the present cooling tower. Personnel from ENV-Water Quality-Risk Reduction Office walked down the facility in 2009, considered the proposed upgrades and annual discharge volumes, and recommended an interim, short-term solution to bring the outfall into compliance until upgrades are installed. The recommendation was to capture the blowdown and to either evaporate it or send it to an onsite facility (SWSS or High Explosive Wastewater Treatment Facility [HEWTF]) for treatment. The annual discharge volume for this outfall is around 2000 gallons, and the largest blowdown volume recorded from previous discharges was about 750 gallons. From this walk down, minor piping modifications were initiated to divert the cooling tower blowdown to a capture tank, install electrical modifications for tank heaters and high-level interlocks, and to plug the existing NPDES Outfall discharge pipe. In addition to the 1000-gallon capture tank, a 300-gallon "tote" tank has been put into place to completely capture this discharge before it enters Outfall 03A130 until final modifications are finished. Materials were ordered in February 2010 and received in March for the upgrade and modifications to this system. Both of the mechanical and electrical modifications to the system were begun during the week of April 12th, and were completed by April 27th, 2010.

The connection between the cooling tower blowdown piping and the PVC outfall pipe has been cut and capped and there are no intentions to ever discharge from this outfall again due to possible copper contamination exceedences and NPDES non-compliance.

Recommendations:

DOE Oversight staff recommends that all four outfalls be deleted from all current and future NPDES permit # NM0028355 as of the date of this letter.

If you have any questions regarding these recommendations, please contact Erik Galloway of our Santa Fe office at (505) 476-6024.

Sincerely,

Stephen Yanicak

Stephen Yanicak, Staff Manager/POC

SY:eg

xc: Gene Turner, DOE, NNSA, LASO MS A316
Anthony Grieggs, LANS, ENV-RCRA/WQ, MS K490
Mike Saladen, LANS, ENV-RCRA/WQ, MS K490
Erik Galloway, NMED, DOE OB MS M894
Courtney Perkins, NMED, DOE OB MS M894
Steve Yanicak, NMED, DOE OB MS M894
Glenn Saums, NMED, SWQB
Richard Powell, NMED, SWQB
LANL NPDES File 2011

DOE/EIS-0380
May 2008

Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico

Volume 1

Chapters 1 through 11

U.S. Department of Energy

NNSA
National Nuclear Security Administration

Los Alamos Site Office

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Table 4–10 Estimated Average Annual Concentrations of Radionuclides in Base Flows in Pueblo and Mortandad Canyons Compared with the Biota Concentration Guides

Radionuclide	BCGs (picocuries per liter)	Lower Pueblo Canyon (at NM 502)		Mortandad Canyon below TA-50 Radioactive Liquid Waste Treatment Facility Outfall	
		Estimated 2005 Time-Weighted Annual Average (picocuries per liter)	Ratio to BCG	Estimated 2005 Time-Weighted Annual Average (picocuries per liter)	Ratio to BCG
Americium-241	400	0.4	0.001	5.1	0.013
Cesium-137	20,000	Not detected	0.0	20	0.001
Tritium	300,000,000	Not detected	0.0	237	0.0000008
Plutonium-238	200	Not detected	0.0	2.1	0.0105
Plutonium-239 and Plutonium-240	200	11	0.055	2.9	0.0145
Strontium-90	300	0.4	0.0013	3.4	0.0011
Uranium-234	200	1.7	0.0085	2.0	0.01
Uranium-235 and Uranium-236	200	0.1	0.0005	1.1	0.0055
Uranium-238	200	1.6	0.008	1.9	0.0095
Sum of Ratios			0.07	–	0.07

BCG = Biota Concentration Guide, TA = technical area.
Source: LANL 2006h.

4.3.1.2 Industrial Effluents

Liquid effluents from LANL's industrial and sanitary outfalls are permitted under the NPDES Industrial Point Source Outfall Program (called NPDES-permitted outfalls). The NPDES permit requires routine monitoring of discharges and reporting of sampling results. The permit specifies the parameters to be measured and the sampling frequency (EPA 2007b).

Notable changes since the *1999 SWEIS* include a reduction in the number of permitted outfalls and the total effluent flow from outfalls, changes to LANL treatment facilities at the Radioactive Liquid Waste Treatment Facility at TA-50 and the High-Explosives Wastewater Treatment Facility at TA-16, and water conservation projects that recycle treated effluent to cooling towers from the TA-46 Sanitary Wastewater Systems Plant (formerly known as the Sanitary Wastewater Systems Consolidation Plant).

LANL has 21 outfalls currently permitted under the industrial permit program. **Table 4–11** shows the number of outfalls and the type of effluent that is discharged through the outfalls.

The 21 NPDES-permitted outfalls at LANL discharge into five local canyons in the LANL region, with the amount of discharge varying from year to year. Figure 4–13 shows the location of the NPDES-permitted industrial outfalls. In 2005, approximately 198 million gallons (749 million liters) of effluent were discharged from all permitted outfalls. This represents a reduction in the number of outfalls, the number of watersheds receiving flow, and the total amount of effluent discharged since publication of the *1999 SWEIS*. Thirty-five outfalls were removed from service as a result of efforts to reroute and consolidate flows and eliminate outfalls; one outfall was reinstated to serve the Laboratory Data Communication Center (TA-3-1498) cooling towers (DOE 1999a, LANL 2005f). The annual flow from permitted outfalls and discharges by watershed is shown in **Table 4–12**.

Table 4–11 National Pollutant Discharge Elimination System Industrial Point Source Outfalls

Number of Outfalls	*Type of Discharge*
1	Power Plant Discharge
1	Boiler Blowdown Discharge
15	Treated Cooling Water Discharge
2	High Explosive Wastewater Treatment
1	Radioactive Liquid Waste Treatment
1	Sanitary Wastewater Treatment
Total 21	

Source: EPA 2007b.

Table 4–12 National Pollutant Discharge Elimination Systems Permitted Outfalls and Discharges by Watershed

Canyon	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Cañada del Buey[a]							
Number of permitted outfalls	3	1	1	1	1	1	1
Discharge (million gallons per year)	2.6	0	0	0	0	0	0
Guaje[b]							
Number of permitted outfalls	6	0	0	0	0	0	0
Discharge (million gallons per year)	1.7	0	0	0	0	0	0
Los Alamos							
Number of permitted outfalls	7	5	5	5	5	5	5
Discharge (million gallons per year)	45.2	37.4	19.34	36.79	34.52	29.57	53.58
Mortandad							
Number of permitted outfalls	6	5	5	5	5	5	5
Discharge (million gallons per year)	39.3	31.6	4.21	31.4	33.12	15.9	16.84
Pajarito[c]							
Number of permitted outfalls	2	0	0	0	0	0	0
Discharge (million gallons per year)	0	0	0	0	0	0	0
Pueblo							
Number of permitted outfalls	1	0	0	0	0	0	0
Discharge (million gallons per year)	0.9	0	0	0	0	0	0
Sandia							
Number of permitted outfalls	6	4	4	5	5	5	5
Discharge (million gallons per year)	213.2	180.2	100.38	108.58	140.41	116.43	127.54
Water[d]							
Number of permitted outfalls	5	5	5	5	5	5	5
Discharge (million gallons per year) (Includes discharge to Cañon de Valle, a tributary)	14.3	16.2	0.102	1.41	1.77	0.62	0.50
Totals							
Number of permitted outfalls	36	20	20	21	21	21	21
Discharge (million gallons per year)	317.2	265.4	124.04	178.18	209.82	162.52	198.46

[a] Includes Outfall 13S from the Sanitary Wastewater Systems Plant, which is permitted to discharge to Cañada del Buey or Sandia Canyon. The discharge is currently piped to TA-3 and ultimately discharged to Sandia Canyon via Outfall 001.
[b] Includes 04A-176 discharge to Rendija Canyon, a tributary to Guaje Canyon.
[c] Includes 06A-106 discharge to Threemile Canyon, a tributary to Pajarito Canyon.
[d] Includes 05A-055 discharge to Cañon de Valle, a tributary to Water Canyon.
Note: To convert gallons to liters, multiply by 3.7853.
Sources: LANL 2003h, 2004f, 2005f, 2006g.

Five canyons (Pueblo, Cañada del Buey, Guaje, Chaquehui, and Ancho Canyons) that previously received LANL discharges are no longer receiving any industrial effluent. Pajarito Canyon has not received any effluent since 1998. Water Canyon and its tributary, Cañon de Valle, Sandia Canyon, Mortandad Canyon, and Los Alamos Canyon continue to receive LANL effluent discharges. Cañada del Buey is permitted to receive effluent from the TA-46 Sanitary Wastewater Systems Plant, but that effluent has been routed to Sandia Canyon since the plant opened (LANL 2005f). Total effluent discharges to the canyons from LANL decreased by about 37 percent over the past 6 years.

It should be noted that the method used to measure and report flow rates at NPDES-permitted outfalls has significantly changed since the *1999 SWEIS*. Historically, instantaneous flow was measured and extrapolated over a 24-hour day, 7-day week period. Flow meters, used since 2001 in many (but not all) outfalls and measuring stations, provide more accurate flow measurements. At those outfalls without meters, the flow is still calculated according to the previous method. Without comparable values, trend analysis of yearly flows is difficult.

The distribution of total industrial effluent contributed by the various facilities (Key and non-Key Facilities) has also changed since the *1999 SWEIS*. Annual effluents generated and discharged are listed by facility in **Table 4–13**. Total effluent discharges from all facilities in 2005 were 63 percent of the total discharges in 1999. In 2005, Key Facilities discharged about 63 million gallons (240 million liters) of effluent, representing 32 percent of the total annual flow; and non-Key Facilities discharged about 135 million gallons (511 million liters) of effluent, or 68 percent of the annual flow. Flows from Key and non-Key Facilities have fluctuated, but generally decreased since 1999. The apparent increase in effluent from the Tritium Facility is due to increased effluent discharges from the TA-21 Steam Plant (LANL 2006g).

Quality of Effluent from NPDES-Permitted Outfalls

LANL personnel collect weekly, monthly and quarterly samples to analyze effluents for compliance with NPDES permit levels. The *1999 SWEIS* reported that LANL had "chronic problems meeting NPDES industrial/sanitary permit conditions" (DOE 1999a). This condition has improved significantly. Since 2000, LANL has maintained an average compliance rate with permit conditions of 99.75 percent. The current compliance rate is summarized in **Table 4–14**. Permit exceedance trends are shown in **Figure 4–14**. The number of samples exceeding permit limits in Table 4–14 may differ from the number of exceedances shown in Figure 4–14 because one sample may exceed two limits. Each of these samples were counted as two exceedances until October 2004, when the method of reporting exceedances was changed so a single sample could only represent one exceedance of permit limits (LANL 2006a). In the event that a permit level is exceeded, DOE reports the condition to the EPA and takes corrective action to address the noncompliance. Details of all exceedance events are provided in the Environmental Surveillance Reports for the respective years (LANL 1999b, 2000e, 2001f, 2002d, 2004a, 2004d, 2005h, 2006h). Generally, exceedances of permit standards in the 5 years since 2000 were of excess total residual chlorine.

Table 4–13 National Pollutant Discharge Elimination Systems Permitted Outfalls and Discharges by Facility

Facility	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Plutonium Complex							
Number of permitted outfalls	1	1	1	1	1	1	1
Discharge (million gallons per year)	8.6	6.5	0.41	2.82	3.02	2.72	2.40
Tritium Facility [a]							
Number of permitted outfalls	2	2	2	2	2	2	2
Discharge (million gallons per year)	9.0	8.6	0.39	13.4	19.03	22.09	32.98
CMR Building							
Number of permitted outfalls	1	1	1	1	1	1	1
Discharge (million gallons per year)	4.5	2.3	0.02	0.76	2.16	1.19	0.92
Sigma Complex							
Number of permitted outfalls	2	2	2	2	2	2	2
Discharge (million gallons per year)	5.77	3.9	0.06	2.00	7.62	1.97	3.80
High Explosives Processing Facility							
Number of permitted outfalls	3	3	3	3	3	3	3
Discharge (million gallons per year)	0.2	0.1	0.04	0.03	0.02	0.037	0.029
High Explosives Testing Facility							
Number of permitted outfalls	3	2	2	2	2	2	2
Discharge (million gallons per year)	14.3	16.1	9.00 [b]	1.38	1.75	0.58	0.47
LANSCE							
Number of permitted outfalls	4	4	4	4	4	4	4
Discharge (million gallons per year)	37.2	30.5	20.45	24.04	16.46	8.12	21.00
Biosciences Facilities (previously called Health Research Laboratory)							
Number of permitted outfalls	1	0	0	0	0	0	0
Discharge (million gallons per year)	0	0	0	0	0	0	0
Radiochemistry Facility							
Number of permitted outfalls	1	0	0	0	0	0	0
Discharge (million gallons per year)	0	0	0	0	0	0	0
Radioactive Liquid Waste Treatment Facility							
Number of permitted outfalls	1	1	1	1	1	1	1
Discharge (million gallons per year)	5.3	4.9	3.6	2.92	2.97	2.14	1.83
Number of permitted outfalls	0	0	0	0	0	0	0
Discharge (million gallons per year)	0	0	0	0	0	0	0
Applies to each of the following facilities: - Pajarito Site - Machine Shops - MSL - Waste Management - TFF - Operations							
Sub-Total Key Facilities							
Number of permitted outfalls	19	16	16	16	16	16	16
Discharge (million gallons per year)	85.0	72.5	24.99	47.17	53.03	38.85	63.43
Non-Key Facilities							
Number of permitted outfalls	17	4	4	5	5	5	5
Discharge (million gallons per year)	232	192.5	99.01	130.83	156.79	123.67	135.03
Totals							
Number of permitted outfalls	36	20	20	21	21	21	21
Discharge (million gallons per year)	317	265	124	178	209.8	162.52	198.46

CMR = Chemistry and Metallurgy Research, LANSCE = Los Alamos Neutron Science Center, MSL = Materials Science Laboratory, TFF = Target Fabrication Facility.

[a] The TA-21 Steam Plant Outfall is included in the Tritium Facility outfall totals and is usually 90 percent or more of the total flow attributed to this Key Facility, although it serves other facilities within that technical area.

[b] Value was incorrectly reported in the LANL 2003h Table 3.2-4 as .006638. The correct value is 9.0, per LANL 2004c.

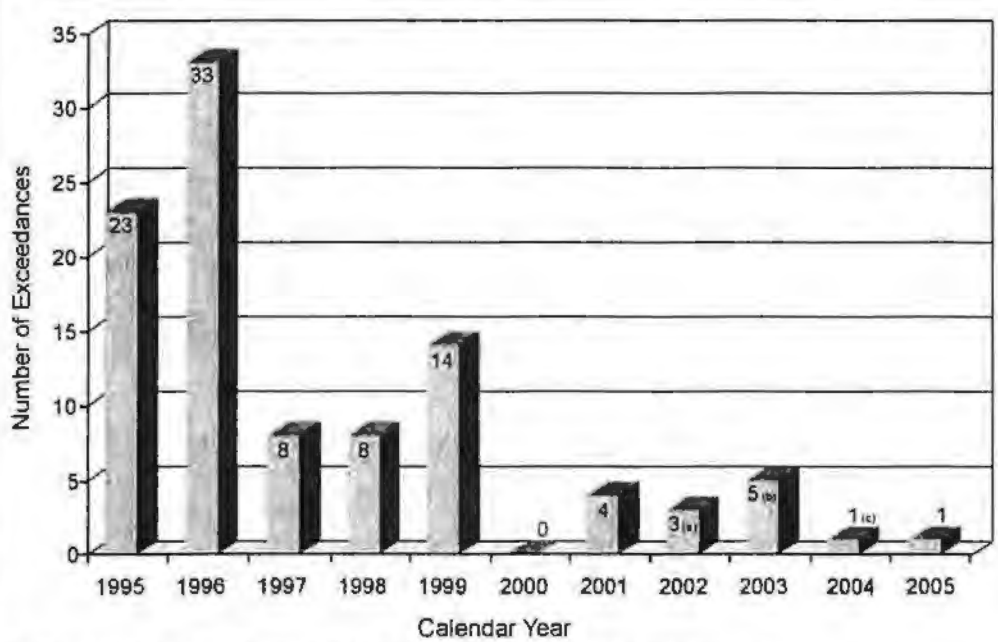
Note: To convert gallons to liters, multiply by 3.785.

Source: LANL 2003h, 2004c, 2004f, 2005f, 2006g.

Table 4–14 Effluent Quality Monitoring and Compliance with Permit Limits for National Pollutant Discharge Elimination Systems-Permitted Outfalls

	1999	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
Industrial Outfalls							
Number of permitted outfalls (as of end of calendar year)	19	20	20	20	20	21	21
Number of samples collected	1,248	1,121	1,085	1,084	958	1,283	949
Number of samples exceeding permit limits	14 [a]	0	4	2 [b]	3 [c]	1 [d]	1
Yearly compliance rate (percent)	98.88	100	99.63	99.82	99.69	99.92	99.89
Sanitary Outfalls							
Number of permitted outfalls (as of end of calendar year)	1	1	1	1	1	1	1
Number of samples collected	175	200	134	129	132	145	126
Number of samples exceeding permit limits	0	0	0	0	0	0	0
Compliance rate (percent)	100	100	100	100	100	100	100

[a] Number of samples differs from Environmental Surveillance Report for 1999 because two samples exceeding permit limits were taken from the Guaje Well, which had been transferred to Los Alamos County ownership in 1998 (LANL 2006a).
[b] One sample exceeded both monthly average and daily maximum permit limits, so it counted as two exceedances.
[c] Two samples exceeded both monthly average and daily maximum permit limits, so they each counted as two exceedances.
[d] One sample exceeded both monthly average and daily maximum permit limits, but is counted as one exceedance under the new reporting method.
Sources: LANL 1999b, 2000e, 2001f, 2002d, 2004a, 2004d, 2005h, 2006a, 2006h.



a) One sample exceeded both monthly average and daily maximum permit limits, so it counted as two exceedances.
b) Two samples exceeded both monthly average and daily maximum permit limits, so they each counted as two exceedances.
c) One sample exceeded both monthly average and daily maximum permit limits, but is counted as one exceedance under the new reporting method.
Sources: LANL 1996b, 1997c, 1999b, 2000e, 2001f, 2002e, 2004a, 2004d, 2005h, 2006a, 2006h.

Figure 4–14 National Pollutant Discharge Elimination Systems Permit Exceedance Trend

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Wastewater Treatment Facility Outfalls

LANL has three wastewater treatment facilities permitted to discharge treated effluent. The sanitary outfall shown in Table 4–14 refers to the TA-46 Sanitary Wastewater System Plant. The other two wastewater treatment facilities are the TA-50 Radioactive Liquid Waste Treatment Facility and the TA-16 High Explosives Wastewater Treatment Facility. Information on the operations of treatment facilities is presented in Section 4.9. Details on the improvements made to the treatment processes at the various wastewater treatment facilities may be found in the *SWEIS Yearbooks* (LANL 2002e, 2003h, 2004f, 2005f, 2006g).

The volume of treated effluent discharged from the TA-50 Radioactive Liquid Waste Treatment Facility has steadily decreased since the *1999 SWEIS*. In 2005, the Radioactive Liquid Waste Treatment Facility discharged 1.83 million gallons (6.9 million liters) compared to the 5.3 million gallons (20 million liters) discharged in 1999. Annual effluent discharges are shown in Table 4–13.

Effluent quality from the Radioactive Liquid Waste Treatment Facility has improved since the *1999 SWEIS*. At that time, the Radioactive Liquid Waste Treatment Facility effluent did not meet water quality discharge standards, resulting in a letter of noncompliance issued by NMED to LANL (LANL 2004c). New treatment processes have been installed since then to improve effluent quality. With these improvements, calendar year 2005 marked the sixth consecutive year that the Radioactive Liquid Waste Treatment Facility effluent had no violations of the NPDES permit limits or exceedances of the DOE Derived Concentration Guides for radioactive liquid wastes (Del Signore and Watkins 2005, LANL 2006a).

During this same 6-year period, the Radioactive Liquid Waste Treatment Facility has also met voluntary NMED groundwater standards for nitrates, fluoride, and total dissolved solids. Similarly, perchlorate concentrations in Radioactive Liquid Waste Treatment Facility effluent has been below the detection limit since March 2002, when perchlorate treatment equipment was installed. In addition, Radioactive Liquid Waste Treatment Facility tritium discharges have been less than one percent of the DOE Derived Concentration Guide since March 2001. Tritium-contaminated effluent that exceeds this voluntary standard of 20,000 picocuries per liter, which is the EPA drinking water standard, is now treated via evaporation at the TA-53 Radioactive Liquid Waste Treatment Plant (LANL 2004d). **Table 4–15** summarizes the water quality in the Radioactive Liquid Waste Treatment Facility effluent for 2005 for certain contaminants.

Since 1999, construction of TA-16 High Explosives Wastewater Treatment Facility has been completed and full operation has begun to comply with Federal Facility Compliance Act Agreement AO Docket No. VI-94-1210. With the operation of this new facility, 19 NPDES-permitted outfalls that previously received contamination from high explosives discharges have been eliminated. Three high explosives processing outfalls remain in use and the effluent discharged through these outfalls was reduced to 0.029 million gallons (0.11 million liters) per year in 2005. Yearly effluent discharged is shown in Table 4–13, High Explosives Processing Facility. The High Explosives Wastewater Treatment Facility is discussed further in Section 4.9 (LANL 2004d, 2005f, 2006g).

Table 4–15 Selected Water Quality Data for Radioactive Liquid Waste Treatment Facility Effluent in 2005

Contaminant	*Average Effluent Concentration in 2005*	*Standard Concentration Limit*	*Water Quality Standard*
Sum of 39 radionuclide ratios, including tritium	Less than 0.18	1.0 Sum of Ratios	DOE Derived Concentration Guideline
Nitrogen as nitrate	3.7 milligrams per liter	10 milligrams per liter	NMED Groundwater Standard for Human Health
Fluoride	0.24 milligrams per liter	1.6 milligrams per liter	NMED Groundwater Standard for Human Health
Total dissolved solids	182 milligrams per liter	1,000 milligrams per liter	NMED Groundwater Standard for Domestic Water Supply
Perchlorate	Not detected	(a)	No current standard
Tritium	3,200 picocuries per liter	2,000,000 picocuries per liter	DOE Derived Concentration Guideline
		20,000 picocuries per liter	EPA Primary Drinking Water Standard

NMED = New Mexico Environment Department, EPA = U.S. Environmental Protection Agency.

[a] The EPA has proposed a drinking water standard for perchlorate of 4 micrograms per liter, but it has not been issued yet.

Sources: LANL 2005h, 2006a, 2006h; Del Signore and Watkins 2005.

Treated liquid effluent from the TA-46 Sanitary Wastewater Systems Plant is currently pumped to storage tanks at TA-3 for reuse or is discharged to Sandia Canyon through an NPDES-permitted outfall.

The *1999 SWEIS* reported that the Los Alamos County Bayo Wastewater Treatment Facility discharges into Pueblo Canyon where that effluent could mobilize sediment contaminants from former LANL operations in Acid Canyon downstream. This facility is not owned or operated by LANL, but it may have an impact on contaminant transport in surface water and groundwater contamination (LANL 2005h).

4.3.1.3 Stormwater Runoff

During New Mexico's summer rainy season, there can be a large volume of stormwater runoff flowing over LANL facilities and construction sites picking up pollutants. The most common pollutants transported in stormwater flows are radionuclides, polychlorinated biphenyls, and metals (LANL 2005h). At the time of publication of the *1999 SWEIS*, conventional programs were in place at LANL to manage and control stormwater runoff from its industrial activities and construction projects. Since then, LANL has improved its monitoring of stormwater runoff. The program improvements are the result of changes in the EPA NPDES stormwater permitting program, increased regulatory attention on stormwater flows from solid waste management units, and ongoing programmatic changes that improve monitoring activities and implement best management practices for stormwater pollution prevention.

Stormwater runoff at LANL was managed under a Multi-Sector General Permit for industrial activities and a General Permit for construction projects in 1999. The Multi-Sector General Permit covered stormwater runoff from 25 onsite industrial activities, which included all solid waste management units as one of those industrial activities. Until March 2003, the Construction General Permit requirements addressed the management of stormwater runoff from various explosives wastewater treated and effluent discharged to NPDES-permitted outfalls. In 2005, the High Explosives Wastewater Treatment Facility discharged about 30,000 gallons (114,000 liters) to an outfall, compared to the *1999 SWEIS* projection of 170,000 gallons (644,000 liters) (LANL 2006g).

4.9.1.4 Industrial Effluent

Industrial effluent is discharged to a number of NPDES-permitted outfalls across LANL. Currently, LANL discharges wastewater to a total of 21 outfalls, down from the 55 outfalls identified in the *1999 SWEIS*. An effort to reduce the number of outfalls was initiated in 1997, with significant reductions realized in 1997 and 1998. Most of these reductions resulted from changes at the High-Explosives Processing Key Facility and High Explosives Testing Key Facility, with the redirection of some flows to the sewage plant at TA-46, and the routing of high explosives-contaminated flows through the High Explosives Wastewater Treatment Facility (LANL 2003h).

Discharges to outfalls are regulated under an NPDES permit, effective February 1, 2001. At most outfalls, actual flows are recorded by flow meters; at the remaining outfalls, flow is estimated based on instantaneous flows measured during field visits. With the exception of discharges during 1999, total discharges for the period of 1998 through 2005 from LANL outfalls have fallen within *1999 SWEIS* projections (LANL 2003h, 2004f, 2005f, 2006g).

4.9.2 Solid Waste

Sanitary solid waste is excess material that is not radioactive or hazardous and can be disposed of in a solid waste landfill. Solid waste generated at LANL is disposed of at the Los Alamos County Landfill, located within LANL boundaries, but operated by Los Alamos County. Solid waste includes paper, cardboard, plastic, glass, office supplies and furniture, food waste, brush, and construction and demolition debris. Through an aggressive waste minimization and recycling program, the amount of solid waste at LANL requiring disposal has been greatly reduced. In 2004, 6,380 tons (5,789 metric tons) of solid waste were generated at LANL, of which 4,240 tons (3,847 metric tons) was recycled (LANL 2004l). The per capita generation of routine solid waste (food, paper, plastic) at LANL has decreased by about 58 percent over the 10-year period from 1993 through 2003 (LANL 2004f). Nonroutine solid waste is generated by construction and demolition projects, and also includes waste generated by Cerro Grande Rehabilitation Project cleanup activities. Recycling of sanitary waste currently stands at 60 percent compared to 1993, when LANL recycled only about 10 percent of the sanitary waste. In 2005, the total amount of recycled sanitary waste reached 4,417 tons (4,007 metric tons), an increase from 2004 (LANL 2006g).

The *1999 SWEIS* projected that the Los Alamos County Landfill would not reach capacity until 2014, however, in accordance with direction from NMED, the County plans on closing the landfill (LAC 2006c). The landfill is expected to operate until fall 2008, when a new transfer station, operated by the County, will be used to sort and ship LANL sanitary wastes to a solid waste landfill outside the county (DOE 2005a).

water contamination more than the No Action Alternative because additional potential contamination sources at MDAs and PRSs would be avoided or eliminated.

Technical Area Impacts

DD&D of buildings at TA-21 would eliminate both the Tritium Science and Fabrication Facility and the Steam Plant, which both discharge industrial effluent into Los Alamos Canyon. As these are the only TA-21 outfalls, discharges from this TA would be eliminated in the Expanded Operations Alternative. The impact on surface water quantity in Los Alamos Canyon would be minor, as these effluents are less than 40 percent of the discharges into that canyon. Removal of these sources would have little to no impact on surface water quality, because the majority of the effluent comes from boiler blowdown and cooling water, which does not contain many contaminants.

Key Facilities Impacts

Under the Expanded Operations Alternative, impacts to surface water quality would be the same as described under the No Action Alternative, except as described below. Construction of a new Radioactive Liquid Waste Treatment Facility, two bridges, other building construction, and demolition of the existing annexes would have little or no adverse impact on surface water quality due to installation of stormwater management and erosion and sediment controls based on compliance with site-specific Stormwater Pollution Prevention Plans and LANL's construction specifications.

Radioactive Liquid Waste Treatment Facility

Proposed increased discharges from the Radioactive Liquid Waste Treatment Facility outfall resulting from increased activity at facilities that generate radioactive liquid waste (see Table 5–5) would result in about a 25 percent higher effluent discharge rate into Mortandad Canyon from that facility, compared to the No Action Alternative. This increase would have a negligible effect on Mortandad Canyon, as the Radioactive Liquid Waste Treatment Facility effluent currently accounts for about 9 percent of LANL's discharges into that canyon. This percentage of overall flow contribution would only increase to 11 percent at the higher discharge rate. Contaminant transport through sediment mobilization could be enhanced due to the increased outfall discharge rate. Cooling water discharges are the only other LANL effluents introduced into Mortandad Canyon.

Operation of a new Radioactive Liquid Waste Treatment Facility would have a beneficial impact on surface water quality because the improved low-level radioactive waste and transuranic waste processes would reduce the contaminant concentrations in the effluent discharged into Mortandad Canyon to levels that could meet potentially more stringent future water quality standards. An auxiliary action, which could be applied to any of the options for the new Radioactive Liquid Waste Treatment Facility, is to construct evaporation tanks and eliminate discharges into Mortandad Canyon. If the facility thus becomes a zero discharge facility, surface water quality would be positively affected. Elimination of effluent flows into the canyon at the Radioactive Liquid Waste Treatment Facility outfall would minimize the potential for contaminated sediments to become mobilized in streams, resulting in a beneficial impact to downstream surface water quality. There would be a minor reduction in surface water quantity in Mortandad Canyon if the Radioactive Liquid Waste Treatment Facility outfall were eliminated. Floodplain size would not be affected by this project.

Pajarito Site

Under the Expanded Operations Alternative, unneeded structures at TA-18 would be removed, thereby removing potential contamination sources from an area where they could be flooded. Parts of TA-18 lie within the 100-year floodplain for Pajarito Canyon. For example, the building that houses the Solution High-Energy Burst Assembly (SHEBA) is partially within the floodplain boundary. Although the possibility of floodwater mobilizing contaminants from the buildings is remote, complete removal of potential contaminant sources would protect surface water quality.

5.3.2 Groundwater Resources

Alternatives evaluated in the SWEIS have the potential to impact the quality of groundwater and the quantity of water available in aquifers. Groundwater quality can be affected by radionuclides and chemicals in liquid and solid waste that infiltrate into the ground. The quantity of groundwater available can be affected by changes in recharge rates and water supply well withdrawal rates. This section addresses potential impacts to groundwater from liquid effluent releases to the canyons and from solid radioactive waste disposal on the mesa tops. In addition, the effects of changes in recharge rates and water supply well withdrawal rates on water levels in the aquifer are discussed.

Impacts to the regional aquifer in the LANL area are generally measured over many years, primarily due to the long time necessary for contaminants to flow through the rock into the regional groundwater and the relatively small volume of water transported through the vadose zone in this arid climate. For the *1999 SWEIS*, significant adverse impacts to the regional aquifer were defined as changes to groundwater that alter the contaminant levels in concentrations above the drinking water standards in a way that can affect human health and safety. This could occur if any of the activities under consideration in the three SWEIS alternatives increase the flow rate of contaminants entering the deep groundwater.

Impacts to the alluvial groundwater are likely to occur more rapidly and could be affected either beneficially or adversely by changes to outfall flows from LANL. Some of the surface water carrying contaminants enters the alluvial groundwater system through canyon bottoms. Although surface-to-subsurface infiltration is fairly rapid in the canyons, any contaminants carried by the surface water are diluted by the large volume of water already stored in the ground; conversely, uncontaminated surface water infiltrating into already contaminated groundwater would cause its dilution over time.

Impacts to the alluvial aquifer may be considered significant if the concentrations of contaminants are altered in relation to the New Mexico and U.S. Environmental Protection Agency (EPA) groundwater standards for irrigation and other non-drinking-water uses. An adverse impact to the alluvial aquifer would be significant if, as a result of any of the activities proposed in the alternatives, contaminant levels increase so that the perched groundwater no

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the hot cell plutonium-238 spill with no confinement is estimated to have the highest risks. For this accident, the annual risks are estimated to be 0.0021 LCFs (1 chance in 480) for the offsite population, 1.3×10^{-5} increased risk (1 chance in 77,000) of LCFs for the MEI, and 8.6×10^{-5} increased risk (1 chance in 12,000) of an LCF for a noninvolved worker located at a distance of 330 feet (100 meters) from the accident.

Table G–23 Radiological Accident Offsite Population and Worker Risks – Radiological Sciences Institute

	Onsite Worker (LCFs)	*Offsite Population (LCFs)*	
Accident	*Noninvolved Worker at 330 Feet (100 meters)* [a]	*MEI* [a]	*Population to 50 Miles (80 kilometers)* [b, c]
Hot cell fire involving plutonium-238 in general purpose heat source modules	3.9×10^{-6}	3.8×10^{-7}	0.00017
Seismic-induced building collapse and fire involving plutonium-238 in general purpose heat source modules [d]	4.4×10^{-6}	8.5×10^{-7}	0.00019
Seismic-induced building collapse with no fire involving plutonium-238 in general purpose heat source modules [d]	4.9×10^{-5}	2.8×10^{-6}	0.00067
Spill of plutonium-238 residue from 0.5-gallon (2-liter) bottles outside of hot cell	2.7×10^{-6}	4.0×10^{-7}	6.5×10^{-5}
Hot cell plutonium-238 spill with no confinement	8.6×10^{-5}	1.3×10^{-5}	0.0021
Main vault fire	$< 7.9 \times 10^{-8}$	$< 7.7 \times 10^{-9}$	$< 3.4 \times 10^{-6}$

LCF = latent cancer fatality, MEI = maximally exposed individual.

[a] Increased risk of an LCF to an individual per year.

[b] Increased number of LCFs for the offsite population per year.

[c] Offsite population size is approximately 300,000 persons located within a 50-mile (80-kilometer) radius.

[c] An updated probabilistic seismic hazard analysis has been completed for LANL (LANL 2007), which results in higher peak horizontal ground acceleration values for the same annual probability of exceedance. In the seismic accident analyses for the Radiological Sciences Institute, the radioactive source term was conservatively based on the assumption that all structures, systems, and components failed, therefore, the updated probabilistic seismic hazard analysis is not expected to change the accident consequences or risks.

Seismic accidents considered for the proposed Radiological Sciences Institute are estimated to have a probability of release of 0.1 (the same as at the Chemistry and Metallurgy Research Building); the Radiological Sciences Institute would be designed to withstand the evaluation-basis earthquake. In comparing a seismic accident scenario that includes a fire with one that does not include a fire, both located within the Radiological Sciences Institute, the former has higher potential for causing offsite population and MEI impacts, while the latter has higher individual worker impacts. This is because the buoyant effects of a fire loft the radioactive plume over the onsite workers, while the greater releases associated with this scenario would impact the general population farther downwind. In contrast, the absence of a fire and its buoyant effects has a greater impact on close-in individuals like the noninvolved worker at 330 feet (100 meters) and the nearby worker population.

G.4 Radioactive Liquid Waste Treatment Facility Upgrade Impact Assessment

This section provides an assessment of environmental impacts for the proposed Radioactive Liquid Waste Treatment Facility Upgrade. Section G.4.1 provides background information on the proposed project. Section G.4.2 provides a description of the proposed options for the Radioactive Liquid Waste Treatment Facility Upgrade. Section G.4.3 presents environmental consequences of the No Action Option and project options for the Radioactive Liquid Waste Treatment Facility Upgrade. The main volume of this SWEIS contains information about the general environmental setting of LANL and environmental impacts associated with continued operations of the site.

G.4.1 Introduction

The Radioactive Liquid Waste Treatment Facility treats radioactive liquid wastes generated at other LANL facilities and houses analytical laboratories supporting waste treatment operations. The principal capabilities and activities conducted at the Radioactive Liquid Waste Treatment Facility include: (1) waste characterization and packaging, including identification and quantification of constituents of concern in waste streams and packaging and labeling waste according to U.S. Department of Transportation regulations; (2) waste transportation including inspection and cross-checking for acceptance; (3) liquid and solid chemical materials and radioactive waste storage; (4) waste pretreatment; (5) radiological liquid waste treatment using a number of treatment processes, including ultrafiltration and reverse osmosis; and (6) secondary waste treatment.

The original Radioactive Liquid Waste Treatment Facility (Building 50-1) as shown in **Figure G–4** was constructed in 1963. Between 1963 and 1986, three annexes were attached to the north, south, and east sides of the original building. With the addition of these annexes, the current facility has a total floor area of approximately 42,300 square feet (3,900 square meters). The North Annex has a footprint of about 5,000 square feet (450 square meters); the East Annex has a footprint of about 7,000 square feet (630 square meters); and the South Annex has a footprint of about 7,500 (700 square meters).

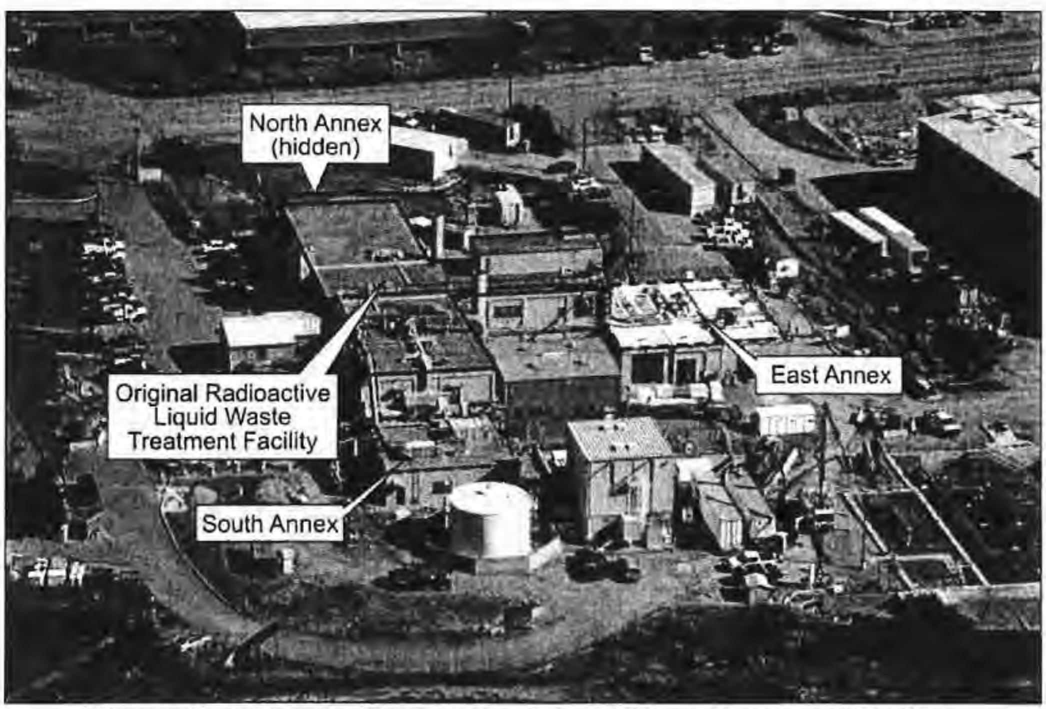

Figure G–4 Existing Radioactive Liquid Waste Treatment Facility

The Radioactive Liquid Waste Treatment Facility is the only facility available at LANL to treat a broad range of transuranic liquid wastes and low-level radioactive liquid waste. However, the ability of this facility to operate reliably is becoming increasingly uncertain. The original building is over 40 years old and has exceeded its design life. Similarly, the clarifiers, rotary vacuum filter, and heating, ventilation, and air conditioning systems, installed in 1963, are also over 40 years old. The infrastructure and treatment equipment require increasing maintenance attention to keep them operational, and replacement parts are increasingly difficult to acquire; replacement components for some older systems are no longer commercially produced. Corrosion of pipes and tanks has resulted in leaks. Radioactive Liquid Waste Treatment Facility materials and components are failing with increased frequency, and key systems could potentially fail within the next 5 to 10 years.

The current Radioactive Liquid Waste Treatment Facility treats all liquid radioactive waste generated at LANL except for that generated at TA-53 and occasionally that from TA-21. A system of pipes collects radioactive wastewater from various facilities, such as the Plutonium Facility at TA-55 and the Chemistry and Metallurgy Research Facility at TA-3, and transfers the wastewater to influent tanks at the Radioactive Liquid Waste Treatment Facility. In a few cases, trucks bring radioactive wastewater from other facilities to the Radioactive Liquid Waste Treatment Facility.

The influent waste stream contains two types of radioactive components: (1) tritiated water, and (2) radioactive solids that are either dissolved or suspended in the liquid. The existing and the proposed Radioactive Liquid Waste Treatment Facility treatment processes are designed to treat the dissolved or suspended solids, but are not able to extract tritiated water. Tritiated wastewater is discharged via a permitted outfall if it meets discharge criteria or is trucked to TA-53's evaporation ponds if it exceeds discharge criteria. Tritiated wastewater has not been trucked to the TA-53 evaporation ponds since 2003.

Although the treatment processes cannot remove tritiated water, they do extract suspended and dissolved radioactive solids from the liquid waste and concentrate the solids by removing additional liquid. The treated liquid is either returned to the low-level radioactive waste influent tank or released to a permitted outfall in Mortandad Canyon. Solid radioactive waste is placed in 55-gallon (208-liter) drums. Drums of solids that meet the waste acceptance criterion regarding liquid content are trucked to TA-54 for storage or disposal. Concentrated liquids resulting from the evaporator portion of the treatment process are sent by truck to a permitted commercial treatment facility in Tennessee for drying, a trip of about 1,400 miles (2,700 kilometers). Typically, about six shipments are made each year. The treatment facility returns the dried solids to TA-54. Drums of solidified transuranic waste from liquid treatment are stored at TA-54 pending preparation for shipment to WIPP near Carlsbad, New Mexico; low-level radioactive waste is disposed of in TA-54.

Future preparation of transuranic waste for shipment is expected to occur in a new TRU (Transuranic) Waste Facility in TA-54 (Appendix H, Section H.3.2.2.2). Some of the functions needed for preparation of transuranic waste from the Radioactive Liquid Waste Treatment Facility may be optionally duplicated in a separate structure co-located with the Radioactive Liquid Waste Treatment Facility. The environmental analysis conducted for the TRU Waste Facility bounds this possibility.

Because many treatment processes work best with water that contains certain ranges of minerals and chemicals and with certain quantities of water, design of the new facility would consider historical usage and future mission requirements. The lower-bound waste volumes assume the generators of radioactive wastewater implement various waste minimization and pollution prevention projects. Calculations of the upper-bound waste volumes assume these waste minimization and pollution prevention projects do not occur and changes in LANL's mission (in particular an increase in pit production up to 80 pits per year) would result in generation of more radioactive wastewater. **Table G–24** shows the quantities of wastewater that the new facilities would be designed to process annually. Upper-bound quantities would be about twice as large.

Table G–24 Design Basis Influent Volumes – Radioactive Liquid Waste Treatment Facility Upgrade

Influent	*Lower Bound (gallons per year)*
Low-level radioactive waste	2,507,000
Acidic transuranic waste	3,700
Caustic transuranic waste	2,600

Note: To convert gallons to liters, multiply by 3.7854.

G.4.2 Options Considered

For the Radioactive Liquid Waste Treatment Facility Upgrade, one No Action Option (see Section G.4.2.1) and three action options (see Sections G.4.2.2, G.4.2.3, and G.4.2.4) are proposed to address facility needs. Additionally, two auxiliary actions to reduce or eliminate the discharge are also proposed (see Section G.4.2.5). The auxiliary actions (evaporation tanks or mechanical evaporation) may be incorporated as part of the No Action Option or any of the three action options. Section G.4.2.6 presents options considered, but dismissed.

G.4.2.1 No Action Option

Under the No Action Option, the Radioactive Liquid Waste Treatment Facility would continue to process transuranic and low-level radioactive wastewater in the existing building. No new construction would occur. The annexes to the original Radioactive Liquid Waste Treatment Facility, which do not meet seismic and wind-loading standards, would not be removed. No existing contaminated materials would be removed. Existing processes would continue to treat liquid transuranic waste and liquid low-level radioactive wastes separately. Treatment processes would result in generation of transuranic sludge, low-level radioactive waste sludge, solid low-level radioactive waste, secondary liquid low-level radioactive wastes (evaporator bottoms), and treated effluent. The transuranic sludge would be solidified (cemented), then transported to TA-54 for storage, characterization, and shipment to WIPP for disposal. The low-level radioactive waste sludge would be dewatered, packaged, and shipped to TA-54 for disposal. Solid low-level radioactive wastes would be packaged and shipped to TA-54 for disposal. Secondary liquid low-level radioactive wastes would be transported by truck to an offsite treatment plant where it would be dried, and the resultant solids would he returned to LANL for disposal at TA-54 as solid low-level radioactive wastes, if it meets waste acceptance criteria. Optionally, effluent from the existing facility could be evaporated as discussed

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in Section G.4.2.5. The existing treatment processes for transuranic waste are shown in **Figure G–5**.

Under the No Action Option, LANL staff would continue to perform routine repairs, safety improvements, and replacement-in-kind of equipment on an as-needed basis. LANL would continue to meet current discharge standards, but may not be able to meet future discharge standards if they become more stringent and the auxiliary actions are not implemented. The existing Radioactive Liquid Waste Treatment Facility would continue to process radioactive liquid wastes until key systems irreparably fail or until the facility can no longer meet discharge standards. System failure or failure to meet discharge standards is estimated to occur sometime within the next 10 years. Therefore, this No Action Option does not meet NNSA's purpose and need to maintain treatment capability at LANL for 50 years.

G.4.2.2 Option 1: Single Liquid Waste Treatment Building Option – Proposed Project

Under the proposed project, NNSA would construct new low-level radioactive waste and transuranic liquid waste treatment facilities to achieve greater reliability, redundancy, and flexibility. A new waste treatment building would have a footprint of about 10,800 square feet (1,000 square meters). The building would consist of a partially below-grade basement, a main floor, and a mezzanine for a total area of 20,700 square feet (1,923 square meters), and would be accompanied by a new central utilities building. NNSA would also modify low-level radioactive and transuranic waste processes to become more effective and better able to incorporate future technology. Portions of the existing Radioactive Liquid Waste Treatment Facility, as described below, would be demolished. The existing facility would not be renovated but would continue to be used for offices and chemical analyses. New equipment would be purchased; some existing equipment may be used to supplement the new equipment and to provide redundancy. Additionally, either one of the auxiliary actions (evaporation tanks or mechanical evaporation) described in Section G.4.2.5 may be added to this option.

The proposed location of the single new low-level radioactive waste and transuranic facility is west of the existing Radioactive Liquid Waste Treatment Facility in an existing parking area (see **Figure G–6**). The building would be sited near the point where transuranic waste lines enter TA-50 to minimize the distance this wastewater must flow to reach the treatment facility. NNSA would conduct DD&D of the East Annex. The existing transuranic storage tank vault (TA-50-66) and the transformer on the north side of the existing Radioactive Liquid Waste Treatment Facility would also be demolished. Some wastewater collection pipes and utilities in the immediate vicinity of the Radioactive Liquid Waste Treatment Facility may be rerouted. Some remediation of contaminated soils would be required.

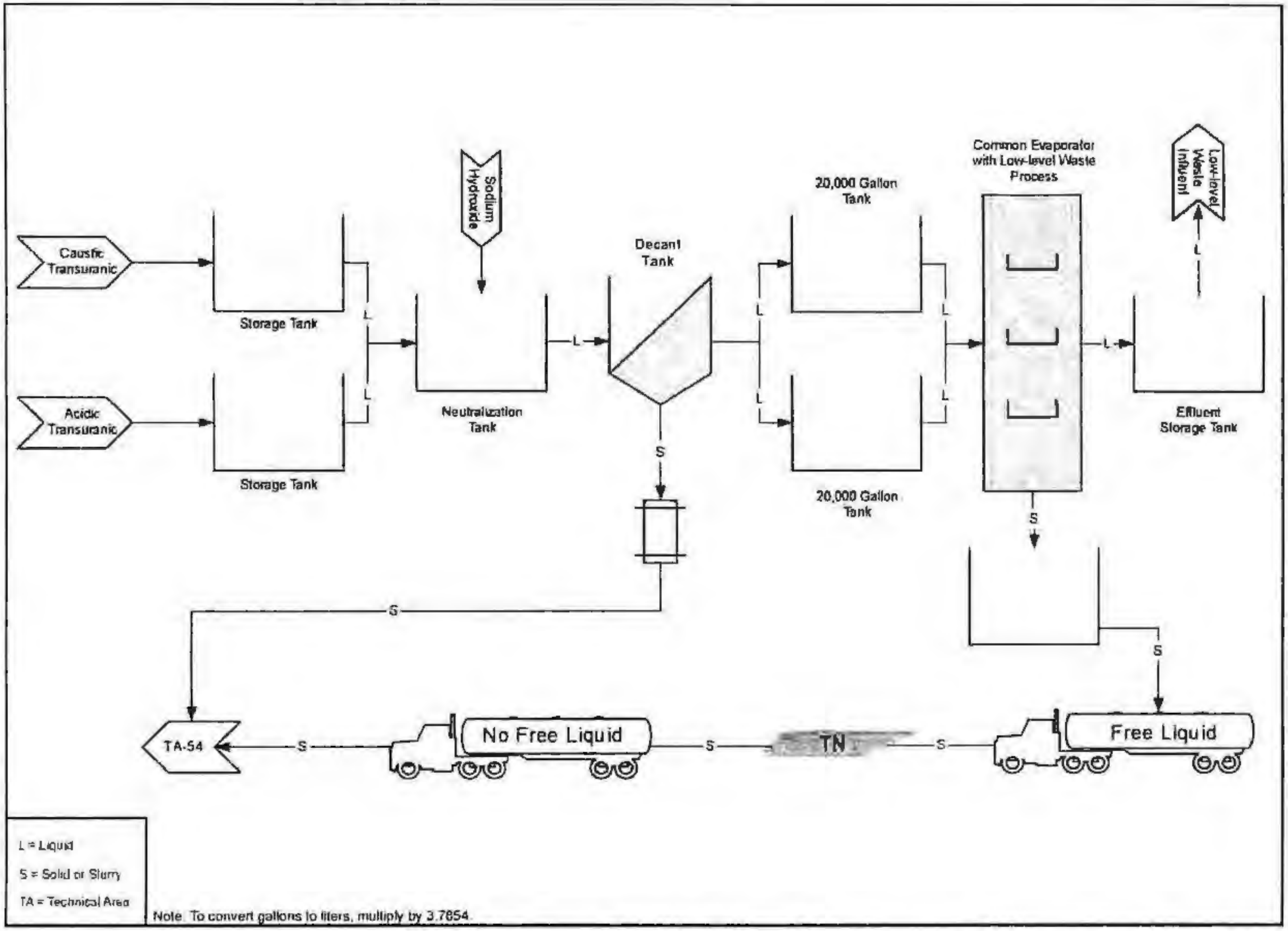

Figure G–5 Existing Treatment Processes for Transuranic Waste

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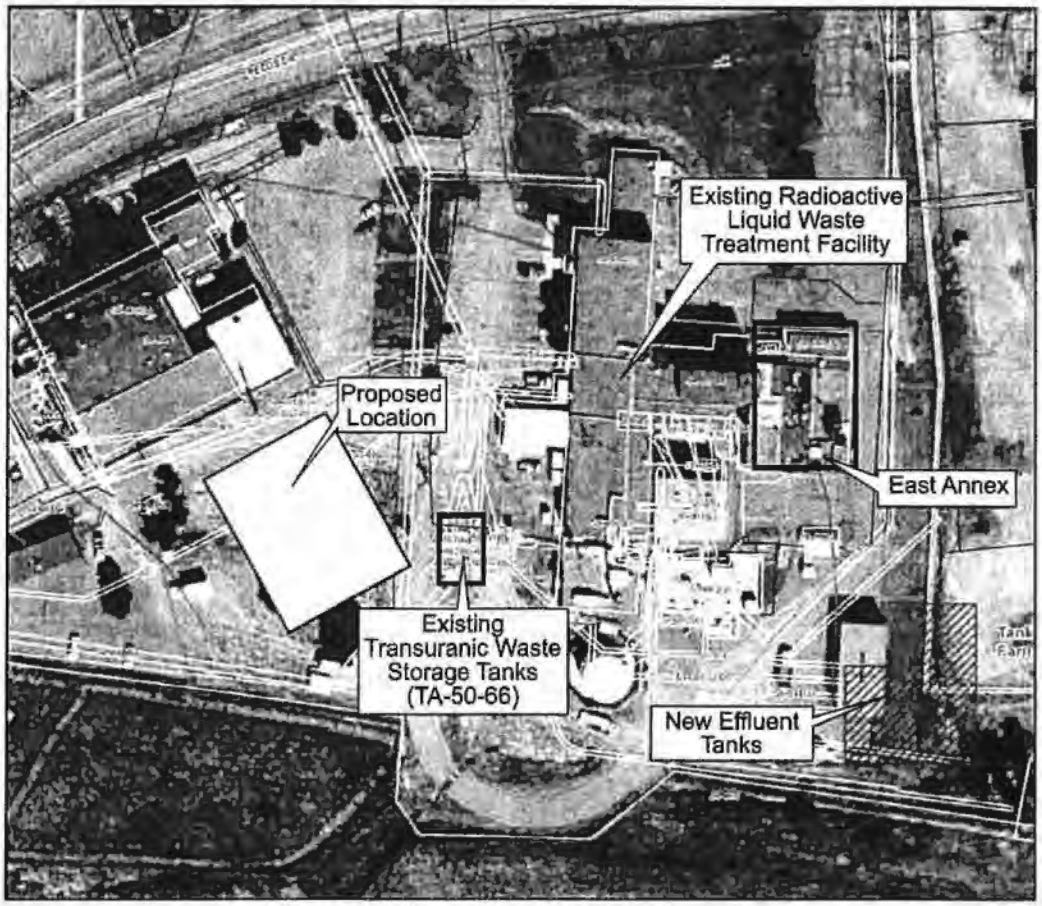
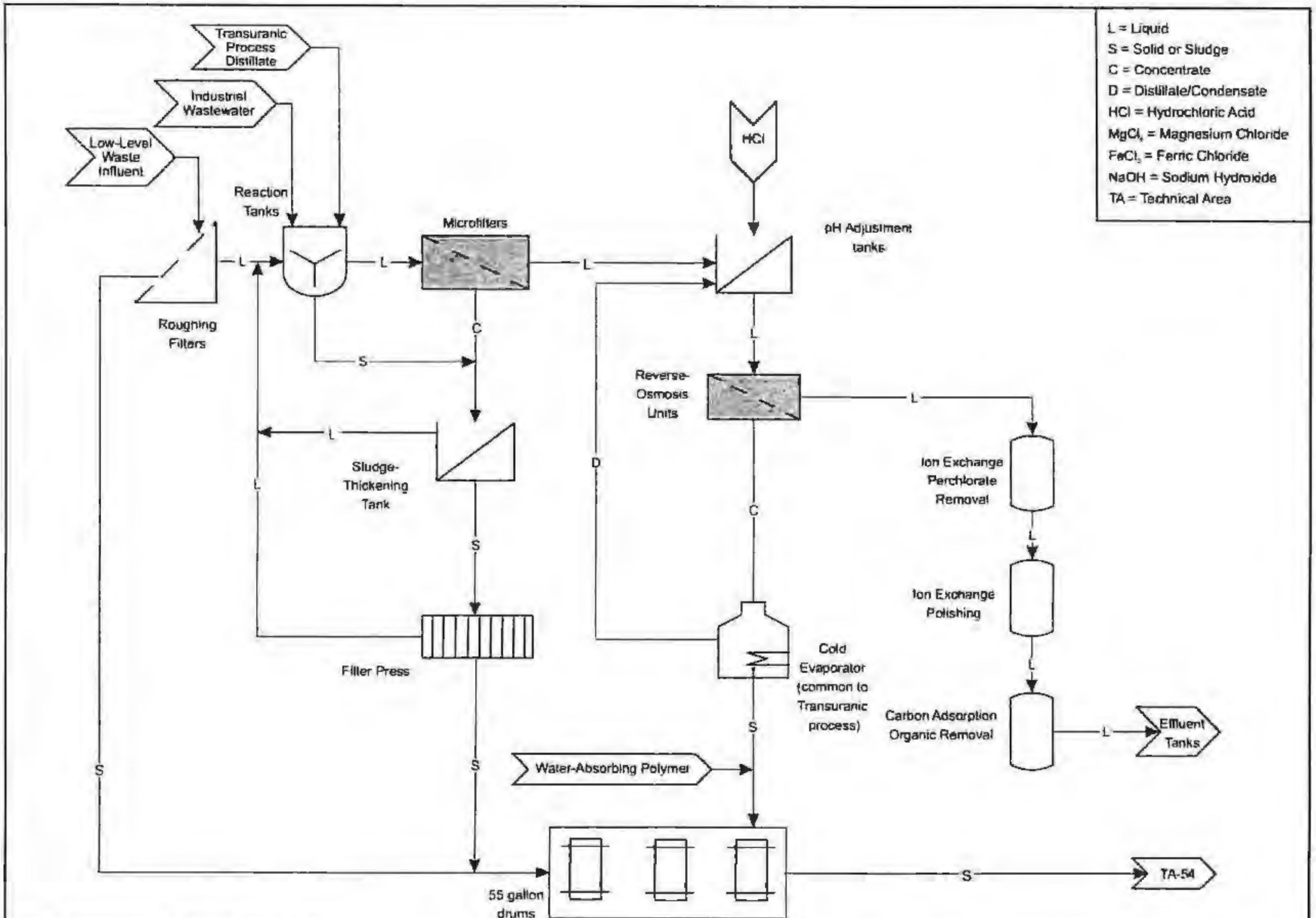


Figure G–6 Proposed Project Location

The proposed low-level radioactive waste treatment process consists of removing suspended and dissolved solids from the liquid waste stream, concentrating the solid waste stream by removing additional liquid, packaging the resulting solid radioactive waste, and ultimately releasing the remaining liquids to a permitted outfall or to evaporative processes. **Figure G–7** shows the proposed low-level radioactive waste treatment process. This process would receive waste via pipeline from the low-level radioactive waste influent tanks and distillate from the transuranic waste treatment process. Some industrial wastewater that cannot be treated by other LANL wastewater treatment systems may also be treated (LANL 2005e). In a typical year, the system could receive approximately 2.5 million gallons (9.5 million liters) of liquid low-level radioactive waste, although the upper bound influent volume may be up to 5 million gallons (20 million liters). The proposed transuranic waste treatment process is shown in **Figure G–8**. The transuranic influent tanks can store approximately 25,000 gallons (96,000 liters) per year of transuranic acid wastewater and 9,000 gallons (34,000 liters) per year of transuranic caustic wastewater. Redundant tanks would handle overflows and drainage.



Note: To convert gallons to liters, multiply by 3.7854.

Figure G–7 Proposed Low-Level Radioactive Waste Treatment Process

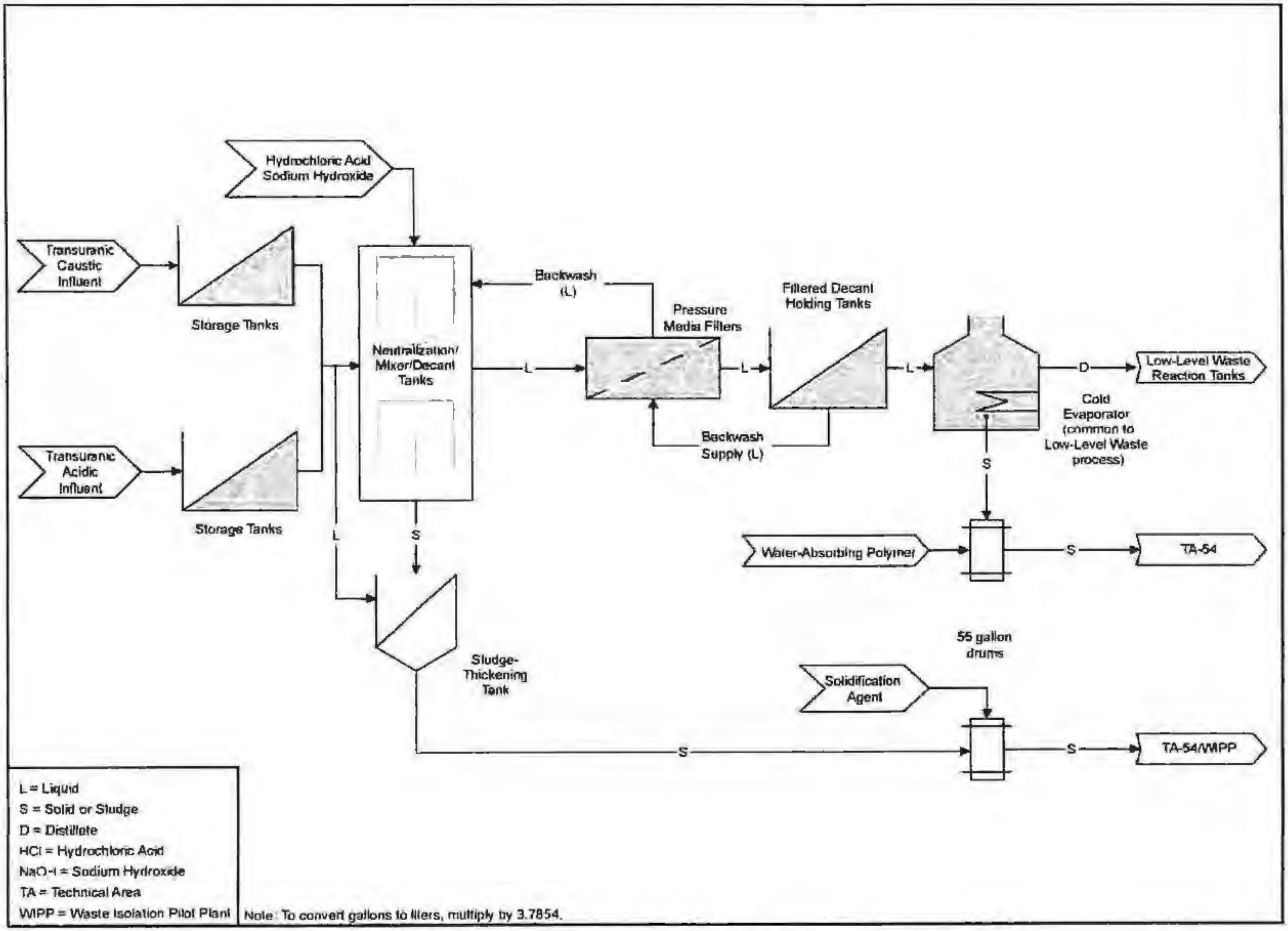


Figure G–8 Proposed Transuranic Waste Treatment Process

G.4.2.3 Option 2: Two Liquid Waste Treatment Buildings Option

This option would involve construction and operation of two new treatment facilities: one for low-level radioactive waste and one for transuranic waste (see **Figure G–9**). A central utilities building would also be constructed. The new low-level radioactive waste facility would have a footprint between 25,000 and 35,000 square feet (2,323 to 3,150 square meters) and would be located on the north side of the Radioactive Liquid Waste Treatment Facility. The transuranic waste facility would be located close to the point where transuranic waste lines enter TA-50, southwest of the existing Radioactive Liquid Waste Treatment Facility, to minimize the distance this wastewater must flow to reach the treatment facility. The transuranic waste facility would require approximately 15,000 square feet (1,350 square meters) of floor space. Like the low-level radioactive waste facility, it would contain processing areas, mechanical rooms, a control room, and access control areas. Additionally, either one of the auxiliary actions (evaporation tanks or mechanical evaporation) described in Section G.4.2.5 may be added to this option.

Locating the new low-level radioactive waste facility north of the existing Radioactive Liquid Waste Treatment Facility would necessitate demolition of the North Annex, in addition to the East Annex, as well as a transformer located on the north side of the existing facility. The existing transuranic waste storage tank vault (TA-50-66) would be demolished. Some remediation of contaminated soils would be required. The new facilities would use the same treatment process as that described for the proposed project. All other aspects of this option are the same as those of the proposed project (Option 1).

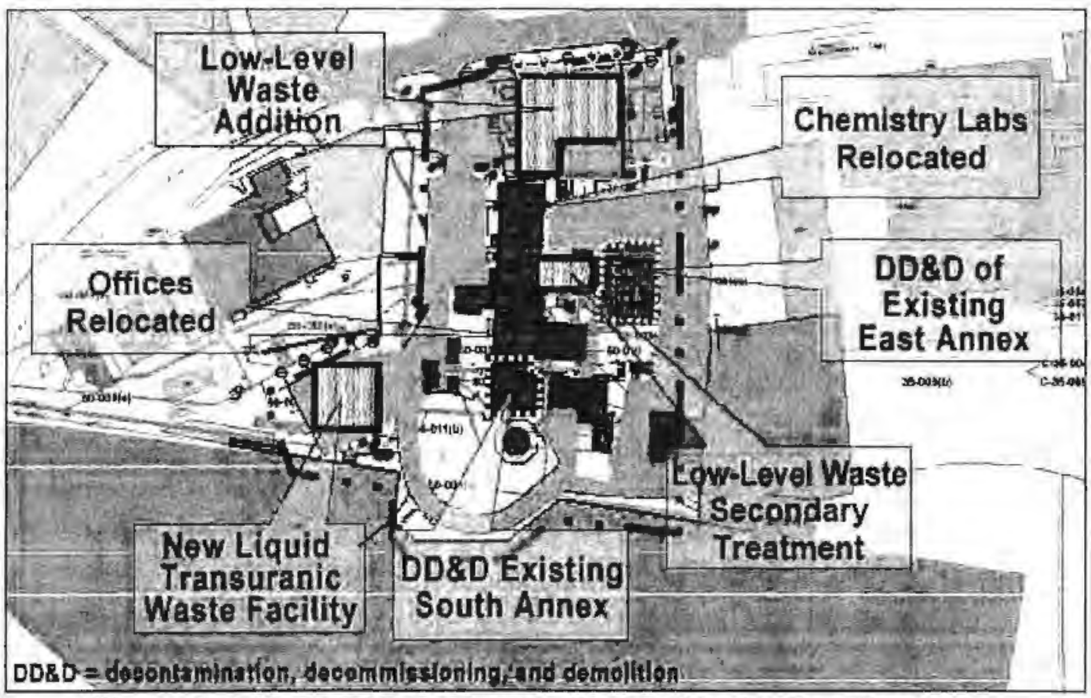


Figure G–9 Proposed Layout under the Two Liquid Waste Treatment Buildings Option

As a variation on this option, treatment functions to be housed in two facilities may be housed in multiple facilities in addition to the central utilities building. For example, separate structures may be constructed for portions of the transuranic waste treatment train rather than being consolidated into one structure.

G.4.2.4 Option 3: Two Liquid Waste Treatment Buildings and Renovation Option

Under Option 3, new buildings would be constructed to house the low-level radioactive waste and transuranic waste treatment processes, as in Option 2. As for Option 2, two new treatment buildings are envisioned, in addition to a central utilities building, although separate functions of the liquid waste treatment trains may be optionally housed in separate structures. In addition, the existing Radioactive Liquid Waste Treatment Facility would be renovated and reused for offices, chemistry laboratories, and drying of various solid residues (secondary waste) from the low-level radioactive waste treatment system.

Upon completion of the new facilities, the low-level radioactive waste and transuranic waste processes would be established in the new facilities and renovation of the existing facility would begin. When renovation is completed, equipment needed to dry the solid residues would be installed and operated in the renovated facility. In the interim, solid wastes would continue to be shipped off site for dewatering. The wastewater streams would be treated in the same way as under the proposed project (Option 1), and the treated effluent would similarly be discharged into Mortandad Canyon, reused, or evaporated. One of the auxiliary actions (evaporation tanks or mechanical evaporation) described in Section G.4.2.5 may be added to this option.

This Two Liquid Waste Treatment Buildings and Renovation Option (Option 3) would entail major structural and infrastructure changes to the existing Radioactive Liquid Waste Treatment Facility. Existing external walls would be removed and replaced with seismically appropriate materials and construction as required to meet LANL engineering standards for Hazard Category 2 facilities. Electrical and plumbing systems that do not meet current building codes would be replaced. Piping that does not conform to spill control requirements would also be replaced. The North, South, and East Annexes would be demolished, as they do not meet seismic requirements; failure of these structures could have a detrimental effect on existing and new construction. Under this option, the process of characterizing, demolishing, and removing contaminated materials would be the same as that under the proposed project (Option 1).

G.4.2.5 Auxiliary Actions

For the Radioactive Liquid Waste Treatment Facility Upgrade, two auxiliary actions are proposed to reduce or eliminate this discharge. The auxiliary actions could be applied to the No Action Option or any of the action options.

The first auxiliary action consists of constructing evaporation tanks and allowing the wastewater to evaporate using passive solar energy. The tanks would consist of up to three individual tanks constructed of lined, self-supporting concrete structures having walls approximately 4 feet high. Each tank would be open on top and have a surface area for evaporation of about an acre, with a total surface tank area of about 3 acres (1.2 hectares). The tanks would be surrounded by a security fence slatted with inserts to provide a wind screen. Except for periodic cleaning to eliminate the buildup of dissolved solids in the water, the tanks would be managed to always retain a minimum level of water. During cleaning, salt (and blown-in dirt) on the floor and sidewalls of the tanks would be flushed to a sump for solids removal, and the filtrate from solids removal returned to the evaporation tanks. The evaporation tanks could be constructed at a site in TA-52, located about a mile east of the Radioactive Liquid Waste Treatment Facility. A pipeline would be constructed to transport effluent from the Radioactive Liquid Waste Treatment Facility to the evaporation tanks.

The second auxiliary action option consists of the use of mechanical evaporation. Evaporative equipment would be purchased and installed at or near the proposed low-level radioactive waste treatment building.

G.4.2.6 Options Considered but Dismissed

Two additional action options were considered but dismissed from further evaluation. The first of these would be to construct the new radioactive liquid waste treatment facilities in another location. This site option was dismissed because the collection system, which is already in place to deliver wastewater to the current Radioactive Liquid Waste Treatment Facility, would need to be rebuilt in new locations. Constructing a new collection system has the potential for negative impacts on a number of resources without a benefit over the options being considered. The existing facility is in reasonable proximity to the source of most of the transuranic wastewater. Any other location would entail additional collection infrastructure and a longer distance over which wastewater would be transferred. In addition, the current facility has an existing NPDES permit to discharge at its current location.

The second option considered but dismissed from further evaluation would be to renovate the existing Radioactive Liquid Waste Treatment Facility to house the new transuranic waste and low-level radioactive waste treatment processes. This option is not feasible, as the capability to treat radioactive liquid wastewater must be maintained so that LANL missions are not impacted. Engineering and process reviews have determined that it is not feasible to install additional treatment equipment in the existing facility while the current treatment process is operating due to lack of space. The existing treatment processes must be maintained with no more than 10 days of downtime to ensure that mission-critical activities in facilities that generate liquid radioactive waste can be maintained. The time required to renovate the existing facility would far exceed 10 days.

G.4.3 Affected Environment and Environmental Consequences

This section presents an analysis of environmental consequences for each of the four options presented in Section G.4.2. Affected environment descriptions are also included where information is available that is specific to the project site and has not been included in Chapter 4 of this SWEIS. Detailed information about the LANL environment is presented in the main volume of this SWEIS. The auxiliary actions (see Section G.4.2.5) are not evaluated separately, but are largely evaluated as part of each of the action options (Options 1, 2, and 3). These auxiliary action evaluations would be also applicable to the No Action Option.

Proposed sites for the new transuranic and low-level radioactive waste buildings are within the developed area of TA-50, adjacent to the existing Radioactive Liquid Waste Treatment Facility. The area has been designated as an industrial area focused on Nuclear Materials Research and Development in *LANL's Comprehensive Site Plan*. Mortandad Canyon, which lies north of the proposed project, is largely undeveloped.

An initial assessment of the potential impacts of the proposed project identified resource areas for which there would be no or only negligible environmental impacts. Consequently, for the following resource areas, a determination was made that no further analysis was necessary.

- *Noise* – Would be managed with standard worker protective measures; no impact on the public due to location.
- *Socioeconomics and Infrastructure* – No new employment is expected. Construction and DD&D workers would be drawn from the pool of construction workers employed on various projects at LANL. Only infrastructure impacts are included in the impacts discussion.
- *Environmental Justice* – The proposed project is mainly confined to already-developed areas of TA-50, with no disproportionate human health impacts to low-income or minority populations expected.
- *Facility Accidents* – Potential facility accidents associated with this proposed project are addressed as part of the No Action Alternative of this SWEIS.

Resource areas examined in this analysis include: land resources, geology and soils, water resources, air quality, ecological resources, human health, cultural resources, site infrastructure, waste management, and transportation.

G.4.3.1 No Action Option

No changes in air emissions or biological resources are expected under the No Action Option. Although the Radioactive Liquid Waste Treatment Facility is currently able to meet existing discharge standards, the facility may not meet more stringent discharge standards in the future. Implementation of the auxiliary action options would greatly reduce or eliminate liquid effluent discharges and therefore beneficially effect water quality. Construction impacts from particulate or radioactive emissions would not occur. There would be no effects on land resources, cultural resources, human health, transportation, traffic, or infrastructure under the No Action Option.

Between 1998 and 2004, the Radioactive Liquid Waste Treatment Facility received a range of about 2.2 million to 5.9 million gallons (8.4 million to 22.3 million liters) of low-level radioactive waste influent per year (LANL 2005e). During that same period, solid low-level radioactive waste volumes ranged from 173 to 510 cubic yards (132 to 390 cubic meters) per year (LANL 2003b, 2004d, 2006a).

During 2005, the facility treated and discharged about 1.8 million gallons (6.8 million liters) of effluent to a permitted outfall. Also during 2005, 339 cubic yards (259 cubic meters) of solid low-level radioactive waste, very small quantities of mixed low-level radioactive waste, and

15.9 pounds (7.2 kilograms) of chemical waste were generated. About 75 cubic yards (57.5 cubic meters) of the low-level radioactive waste was construction soil and debris from installing influent storage tanks for the Cerro Grande Rehabilitation Project (LANL 2006f).

Under the No Action Option, low-level radioactive waste volumes are expected to be similar to the past few years of Radioactive Liquid Waste Treatment Facility operation, when more-efficient treatment equipment was brought online and radioactive solids were more effectively removed than in previous years. Because the treatment process would not be improved under the No Action Option, the amount of solid low-level radioactive waste to be generated would be largely a product of the influent volume and contamination concentrations. The average influent volume for 2003–2004 was 2.7 million gallons (10.3 million liters), while average low-level radioactive waste generation was 488 cubic yards (373 cubic meters) (LANL 2003b, 2004d, 2006a). Influent and waste generation levels were smaller than those averages in 2005 (LANL 2006f). If all pollution prevention measures and mission changes are implemented as scheduled, low-level radioactive waste influent volumes are expected to decrease slightly from current levels by about the year 2014 (LANL 2005e). Solid low-level radioactive waste volumes are expected to decrease slightly as well.

Similarly, because the treatment process would not be improved under the No Action Option, transuranic waste quantities would be a function of the influent volume and influent contamination concentrations. For the years 1998-2002, the Radioactive Liquid Waste Treatment Facility received on average 1,412 gallons (5,346 liters) of caustic transuranic and 8,792 gallons (33,276 liters) of acid transuranic influent per year. In that same period, the Radioactive Liquid Waste Treatment Facility produced approximately about 6.5 to 7.8 cubic yards (5 to 6 cubic meters) of solid transuranic and mixed transuranic waste annually. Under the No Action Option, the transuranic waste influent would approximately double if mission changes and pollution prevention measures are implemented. The amount of transuranic solid waste generated by treatment of the influent is likely to increase in a similar way.

Construction and operation of the evaporation tanks would have the same impacts as those detailed for Options 1, 2, and 3 in Section G.4.3.2.

G.4.3.2 Option 1: Single Liquid Waste Treatment Building Option – Proposed Project

Land Resources—Land Use

Land in TA-50 where the new building would be constructed is in the immediate vicinity of the Radioactive Liquid Waste Treatment Facility, a highly developed area with a land use designation of Waste Management (see Section 4.1 for a land use map and description). If evaporation tanks were constructed, the pipeline to them would be routed east through TA-63 and TA-52 in areas with current land use designations of Physical and Technical Support, Experimental Science, and Reserve. The proposed location of the evaporation tanks near the border of TA-52 and TA-5 is designated Reserve (LANL 2003b).

Construction Impacts—Construction of the new liquid waste management building would occur in a developed area and result in no changes to current or future land use designations. If the option to construct evaporation tanks is implemented, the land use designation for the tank areas and along a portion of the pipeline would likely change from Reserve to Waste Management. The tanks themselves could occupy approximately 3 acres (1.2 hectares), but a somewhat larger area (up to 4 acres [1.6 hectares]) would undergo a change in land use designation. Removing this land from the Reserve designation was not previously accounted for in land use plans (LANL 2004d).

Land Resources—Visual Resources

As noted previously in the land use discussion, the area in which the treatment buildings would be constructed is a highly developed area. This area currently has an industrial look, with a mix of buildings of different design. The area proposed for construction of the tanks is currently undeveloped and wooded.

Construction Impacts—There would be temporary local visual impacts associated with construction of the new treatment building, and during excavation from the use of construction equipment. The current natural setting in the area of the evaporation tanks, and a portion of the pipeline, would be disrupted by removal of vegetation, establishment of a construction staging area, and construction activities. Construction would entail excavation of soils to construct the tanks and pipeline, and possibly the temporary establishment of a soil pile. Excess soils would be removed and used or stockpiled elsewhere.

Operations Impacts—The new treatment building would not result in a change to the overall visual character of the area within TA-50. The facility would be a maximum of two stories and constructed in accordance with site guidelines, which establish acceptable color schemes for building exteriors. Establishment of evaporation tanks would result in a permanent change to the visual environment in the area near the border of TA-52 and TA-5. Although this change would result in a noticeable break in the forest cover when seen from higher elevations to the west of LANL, due to their low profile and the presence of nearby forest vegetation, the tanks would not likely be visible from the east. Additionally, the tanks would be surrounded by a fence that would be colored to blend with the surrounding environment. Following regrowth of vegetation, the area disturbed for pipeline construction would not be noticeable.

DD&D Impacts—Removal of the East Annex and TA-50-66 would result in temporary local visual impacts in the form of construction equipment and the presence of partially demolished buildings. Long-term effects would be a slightly improved local visual environment, once the annex and TA-50-66 are removed.

Geology and Soils

The existing Radioactive Liquid Waste Treatment Facility is categorized as a potential release site; other potential release sites representing possible historic spills, polychlorinated biphenyls, or leakage of radioactive wastewater are present in the vicinity of the proposed construction at TA-50. A large radioactive waste material disposal area (MDA), designated MDA C, is immediately south of the existing Radioactive Liquid Waste Treatment Facility. NNSA is implementing environmental investigation and remediation measures for MDA C and other potential release sites at TA-50 in accordance with DOE requirements and the Consent Order.

TA-50 is approximately 0.8 miles (1.25 kilometers) east of the nearest mapped fault, a subsidiary of the Rendija Canyon Fault (see Section 4.2 of this SWEIS). However, previous study indicates that the level of seismic risk is low and is manageable through facility design. Any new facilities would be designed in accordance with current DOE seismic standards and applicable building codes.

Because building construction would occur within areas already disturbed by previous facility construction, there would be no impact on native soils. Construction of the new facilities would require removal of facility soils as well as new excavation of shallow bedrock in some areas. As a result, construction activities would generate excess soil and excavated bedrock that may be suitable for use as backfill. Uncontaminated backfill would be stockpiled at an approved material management area at LANL for future use. Best management practices would be implemented to prevent erosion and migration of disturbed materials from the site caused by stormwater, other water discharges, or wind.

Construction Impacts—Approximately 36,000 cubic yards (28,000 cubic meters) of soil and rock would be disturbed during building excavation. If construction of the evaporation tanks and associated pipeline also occurs, an additional 69,000 cubic yards (53,000 cubic meters) of excavation work would be required. Nevertheless, the proposed project would initiate removal of contaminated areas adjacent to the Radioactive Liquid Waste Treatment Facility and would have a positive effect. The East Annex and TA-50-66 would also be demolished, and remediation of associated potential release sites would be initiated.

Operations Impacts—There would be minimal operations impacts on geology and soils. Evaporation of liquid effluent would eliminate addition of contaminants to soil and sediment below the existing permitted outfall. As noted above, construction activities may remove contaminated media, resulting in a reduced potential for contamination spread from past releases.

DD&D Impacts—Contaminated material would be removed from the areas affected by demolition and construction, and would he managed according to waste type and LANL procedures.

Water Resources

The Radioactive Liquid Waste Treatment Facility currently releases treated effluent to Mortandad Canyon at a permitted outfall. Other industrial outfalls and stormwater also discharge into Mortandad Canyon, both upstream and downstream from the Radioactive Liquid Waste Treatment Facility. Mortandad Canyon crosses lands belonging to the Pueblo of San Ildefonso before discharging into the Rio Grande. Existing contaminants are known to be present in Mortandad Canyon. A permeable reactive membrane barrier designed to trap contaminants and to prevent their movement downstream toward the Pueblo of San Ildefonso is located downstream from TA-50.

Construction Impacts—Construction could result in movement of contaminated and uncontaminated materials. The effects of construction would be mitigated by implementation of a stormwater pollution prevention plan to contain sediments and prevent erosion.

Operations Impacts—The overall effect of implementing the proposed project is expected to be positive. This option would ensure that both current and projected future discharge requirements could be met. During operations, effluent water quality is expected to improve due to improved processing and potentially more-stringent discharge requirements. If discharges are eliminated or greatly decreased through recycling or evaporation, movement of contaminants in groundwater and surface water in Mortandad Canyon is expected to decrease. If liquid discharge is not reduced or completely eliminated by recycling or evaporation, the permeable reactive membrane barrier is expected to mitigate the downstream movement of contaminants. The potential for spills of contaminated water would be greatly reduced by replacing single-walled piping with double-walled pipes and by use of secondary containment structures.

DD&D Impacts—Demolition could result in mobilization of particulates that could be entrained in offsite sediments. However, erosion control measures specified in a stormwater pollution prevention plan would be implemented. Movement of contaminated or uncontaminated materials is, therefore, expected to be negligible.

Air Quality

The Radioactive Liquid Waste Treatment Facility contributes less than 1 microcurie of radioactive emissions to LANL's total radioactive emissions. Likewise, Radioactive Liquid Waste Treatment Facility emissions of criteria air pollutants (nitrogen oxides, sulfur oxides, particulate matter, carbon monoxide, and volatile organic compounds) and other hazardous air pollutants are small relative to LANL's overall emissions.

Construction Impacts—Construction and demolition would result in temporary increases in particulate emissions.

Operations Impacts—Sufficient information to assess emissions and doses from a new treatment building is not yet available. The effect of the proposed project on air quality is expected to be minimal. During operations, radioactive air emissions are expected to be within an order of magnitude of current air emissions. Because current radioactive air emissions are very low, radioactive emissions from the processes to be implemented under any of the new construction options would likely not be major contributors to the total LANL radioactive emissions. Stack monitoring requirements would be adjusted as necessary based on the final design. New combustion equipment installed as part of any of the new construction options would be low-nitrogen-oxide emitters compared to existing equipment. Radiological and nonradiological emissions associated with solar evaporation of effluent are expected to be small, and dominated by evaporation of water containing tritium.

DD&D Impacts—Demolition of the East Annex and the transuranic waste influent storage tanks (TA-50-66) would likely produce radioactive or hazardous emissions. These emissions would be temporary, but released particulates could be dispersed to other areas. Because of the presence of contaminated soils and structural materials, there is potential to release radioactive or other hazardous constituents. Standard measures for controlling fugitive emissions would be employed.

Ecological Resources

The Radioactive Liquid Waste Treatment Facility is located within a highly developed industrial area of TA-50 and contains no important biological resources. However, the evaporation ponds would be located in an open field containing scattered trees. Mortandad Canyon contains breeding and foraging habitat for the Mexican spotted owl. The industrial area where the Radioactive Liquid Waste Treatment Facility is located is within developed Mexican spotted owl core habitat and its developed buffer zone. The area where the evaporation tanks would be located is also within the buffer and cores zones of the Sandia and Mortandad Canyon Area of Environmental Interest (LANL 2000).

Construction Impacts – Construction of the new Radioactive Liquid Waste Treatment Facility would not disturb any natural habitat. The biological assessment prepared by DOE, however, determined that constructing the evaporation tanks and pipeline would remove about 5.4 acres (2.2 hectares) of undeveloped core and buffer habitat of the Mexican spotted owl (LANL 2006b). It was also determined that construction of the Radioactive Liquid Waste Treatment Facility would likely result in noise levels greater than 6 dB(A) above background levels in the core zone; however, these levels should attenuate to below this level within 0.25 miles (0.4 kilometers) of the construction site. The biological assessment concluded that with the application of reasonable and prudent alternatives the project may affect, but is not likely to adversely affect, the Mexican spotted owl. Reasonable and prudent alternatives would include not permitting work to start between March 1 and the completion of surveys aimed at determining if owls were present in order to avoid a sudden increase in noise levels during the breeding season (LANL 2006b). Additional reasonable and prudent alternatives would be similar to those addressed in Section G.3.3.2. The USFWS has concurred with this assessment (see Chapter 6, Section 6.5.2).

The bald eagle Area of Environmental Interest is not located near the proposed project site. However, because the entire LANL site is considered potential bald eagle foraging area, there may be some habitat degradation associated with the project. Provided reasonable and prudent alternatives are implemented to protect adjacent foraging habitat from detrimental cumulative effects (see Section G.2.3.2), the DOE biological assessment concluded that construction of the Radioactive Liquid Waste Treatment Facility may affect, but is not likely to adversely affect, the bald eagle. Because the proposed project is not within or upstream of the southwestern willow flycatcher Area of Environmental Interest, the biological assessment determined that the project would not affect this species (LANL 2006b). The USFWS has concurred with the DOE biological assessment as it relates to the bald eagle and southeastern willow flycatcher (see Chapter 6, Section 6.5.2).

Operations and DD&D Impacts – No direct effects on sensitive species are expected from Radioactive Liquid Waste Treatment Facility Operations. However, a biological assessment prepared by DOE predicted that if water is evaporated and not discharged to Mortandad Canyon the reduction in flow would decrease the extent of perennial and intermittent stream reaches and associated wetland and riparian habitat. This could in turn reduce the abundance and diversity of prey species for the Mexican spotted owl. Thus, the biological assessment concluded that zero discharge may adversely affect the Mexican spotted owl (LANL 2006b). But after reviewing the assessment, the USFWS determined that the affects to the Mexican spotted owl would be insignificant and discountable, and would not result in adverse affects (see Chapter 6, Section 6.5.2).

DD&D effects are expected to be temporary and to have no direct impact on sensitive species.

Human Health

The Radioactive Liquid Waste Treatment Facility has very low radioactive emissions. These emissions do not have a distinguishable effect on the projected dose to the public. Current Radioactive Liquid Waste Treatment Facility operations are conducted with a commitment to maintaining radiological doses to workers at ALARA levels.

Construction Impacts—Construction would have potential for affecting only worker health. Based on an estimated 141,000 projected person-hours and accident rates for construction at DOE sites and for the general construction industry, 2 to 6 recordable injuries and no fatalities could be expected from construction of the new treatment buildings and associated structures. If the evaporation tanks and pipeline were built, an additional 420,000 person-hours would be required, with a possibility of 5 (DOE 2004) to 18 (BLS 2003) recordable injuries.

Operations Impacts—Emissions from operating the new treatment processes would remain very low, so there would be no distinguishable contribution to the dose to the public from all LANL activities. Emissions from effluent evaporation would be small and dominated by tritium, assuming operation of the evaporation tanks as described in Section G.4.2.5. The potential quantity of evaporated tritium would be minimal compared to the quantity of tritium emitted from other Key Facilities (for example, the Tritium Facility and the Plutonium Facility). The associated radiation dose would be small and enveloped by the impacts to the public discussed in Chapter 5, Section 5.6.1.

Worker health and safety at the facility would improve during operations under this option for two reasons: (1) the new buildings, equipment, and infrastructure would be more reliable and require less maintenance; and (2) because the buildings and process are being designed together (rather than retrofitting new equipment into an old building), when maintenance is needed, prolonged periods of time in zones with potential for radiation doses would be less than those in the current Radioactive Liquid Waste Treatment Facility. Maintenance of the evaporation tanks including periodic cleaning may cause occupational exposures to workers. However, radiation doses would be maintained to levels as low as reasonably achievable below DOE occupational dose limits in 10 CFR Part 835, and exposures to non-radioactive materials would be maintained well below established occupational exposure limits.

DD&D Impacts—Under this option, workers could be exposed to radiologically or chemically contaminated materials during demolition activities. Worker risks would be mitigated by use of personal protective equipment and pre-established safety procedures. Based on an estimated 56,000 person-hours and construction accident rates, 1 to 2 recordable injuries could be expected to occur from DD&D (DOE 2004, BLS 2003).

Cultural Resources

There are no archaeological remains within the developed area of TA-50. Archaeological sites in the vicinity of the proposed evaporation tanks and pipeline would be avoided. The existing Radioactive Liquid Waste Treatment Facility qualifies as a historic building. Any removal of process equipment or demolition of portions of the structure requires historic building documentation to mitigate any adverse effects.

Construction Impacts—Under Option 1, construction would not affect cultural resources. Changes in the Radioactive Liquid Waste Treatment Facility process area would require historic documentation before any equipment is removed from the building. Any mitigation plans would have to be implemented before or during project implementation.

The pipeline and tanks would be sited to avoid impacts on nearby archaeological sites to the extent practical. However, if the pipeline alignment or the tanks encroached on cultural sites, the sites would be fenced for avoidance or excavated.

Operations Impacts—Operations conducted under the proposed project would not affect historic buildings.

DD&D Impacts—Effects on historic buildings under this option are expected to be minimal. Removal of the East Annex is not likely to affect the original historic fabric of the Radioactive Liquid Waste Treatment Facility. Removal of both the East Annex and the transuranic waste influent storage vault (TA-50-66) would require historic documentation before the demolition process began.

Socioeconomics and Infrastructure

Major infrastructure (potable water, sewage, natural gas, and electricity) is available at TA-50. As necessary, utility infrastructure and capacity will be evaluated under a separate action to determine upgrade requirements due to demand from proposed new projects, including the Radioactive Liquid Waste Treatment Facility. Recently installed natural gas infrastructure would adequately accommodate the Radioactive Liquid Waste Treatment Facility. The radioactive liquid waste collection system, which pipes radioactive liquid waste to the Radioactive Liquid Waste Treatment Facility, requires improvements such as replacing manholes and installing monitoring equipment. Within the Radioactive Liquid Waste Treatment Facility, the piping is largely single-walled and has inadequate leak and spill protection. The electrical system within the existing facility does not meet current codes.

Construction—Utility infrastructure resources would be needed for Radioactive Liquid Waste Treatment Facility construction. Standard construction practice dictates that electric power needed to operate portable construction and supporting equipment be supplied by portable diesel-fired generators. Therefore, no electrical energy consumption would be directly associated with construction. A variety of heavy equipment, motor vehicles, and trucks would be used, requiring diesel fuel, gasoline, and propane for operation. Liquid fuels would be brought to the site as needed from offsite sources and, therefore, would not be limited resources. Water would be needed primarily to provide dust control, aid in soil compaction at the construction site, and possibly for equipment washdown. Water would not be required for concrete mixing, as ready-mix concrete is typically procured from offsite resources. Portable sanitary facilities would be provided to meet the workday sanitary needs of project personnel on the site. Water needed for construction would typically be trucked to the point of use, rather than provided by a temporary service connection. Construction is estimated to require 190,000 gallons (720,000 liters) of liquid fuels and 1.0 million gallons (3.8 million liters) of water.

If evaporation tanks and pipeline were constructed, an additional 850,000 gallons (3.2 million liters) of liquid fuels and 6.5 million gallons (25 million liters) of water would be required.

The existing LANL infrastructure would be capable of supporting requirements for new facility construction without exceeding site capacities, resulting in a negligible impact on site utility infrastructure.

Operations Impacts—Utility demands in TA-50 are expected to increase. Operations at both the new Chemistry and Metallurgy Research Building Replacement and the Radioactive Liquid Waste Treatment Facility would potentially require more natural gas and electric power over time. As stated previously, utility infrastructure needs are being separately evaluated. Nevertheless, the proposed project would be subject to an energy efficiency study as it reaches detailed design phases. The preliminary facility design limits energy use to some extent by the use of cold evaporators instead of more energy-consumptive driers or other evaporative equipment.

DD&D Impacts—Activities associated with DD&D of facilities to be replaced by the new facility would be staggered over an extended period of time. As a result, impacts of these activities on LANL's utility infrastructure are expected to be very minor on an annualized basis. Standard practice dictates that utility systems serving individual facilities are shut down as they are no longer needed. As DD&D activities progress, interior spaces, including associated equipment, piping, and wiring, would be removed prior to final demolition. Thus, existing utility infrastructure would be used to the extent possible and would then be supplemented or replaced by portable equipment and facilities as DD&D activities proceed, as previously discussed for construction activities. DD&D is estimated to require 1,700 gallons (6,500 liters) of liquid fuel and 52,000 gallons (197,000 liters) of water.

Waste Management

The existing Radioactive Liquid Waste Treatment Facility does not contain RCRA regulated treatment, storage, and disposal facilities. All RCRA-regulated waste is managed in less-than-90-day storage areas before being packaged and trucked to TA-54 for offsite treatment and disposal. In 2005, the Radioactive Liquid Waste Treatment Facility produced approximately 16 pounds (7.2 kilograms) (LANL 2006f) of chemical waste compared to about 4,850 pounds (2,200 kilograms) of chemical waste projected by the *1999 SWEIS* (DOE 1999a).

The Radioactive Liquid Waste Treatment Facility typically generated about 170 to 262 cubic yards (130 to 200 cubic meters) of solid low-level radioactive waste annually between 1998 and 2002 (LANL 2003b). In 2003, 510 cubic yards (390 cubic meters) of low-level radioactive waste were generated, in 2004, 464 cubic yards (355 cubic meters) were generated (LANL 2004d, 2005c), and in 2005, 339 cubic yards (259 cubic meters) were generated (LANL 2006f). Less than 4 percent of the low-level radioactive waste volume was mixed low-level radioactive waste (LANL 2003b, 2004d). Between 1998 and 2002, the Radioactive Liquid Waste Treatment Facility generated about 39 cubic yards (30 cubic meters) of transuranic or mixed transuranic solid waste, of which about one-third was mixed transuranic waste (LANL 2003b). Due to operational interruptions in 2003 and 2004, the Radioactive Liquid Waste Treatment Facility generated no transuranic waste and only 4 cubic yards (2.7 cubic meters) of mixed transuranic waste during those 2 years (LANL 2004d, 2005c). No transuranic or mixed transuranic waste was generated during 2005 (LANL 2006f).

Construction and DD&D Impacts – **Table G–25** lists the types and volumes of waste expected to be generated during construction and demolition of buildings under Option 1. Nearly 4,900 cubic yards (3,700 cubic meters) of low-level radioactive waste is projected to be soil and debris containing so little radioactive or hazardous material that it can be disposed in bulk using lift liners or similar disposal containers that are transported in reusable transport packages such as Intermodals. Packaged low-level radioactive waste would include small quantities of low-level radioactive waste from one-time transitioning from the existing Radioactive Liquid Waste Treatment Facility, and additional one-time waste from facility stand-down. This waste would include low-level radioactive waste sludges that would be drummed, solidified, and disposed of at TA-54 or any other authorized facility, as well as small quantities of used filters, membranes, and expendable supplies. A small amount of mixed low-level radioactive waste is expected to be generated from DD&D activities.

Table G–25 Construction and Decontamination, Decommissioning, and Demolition Waste Volumes – Single Waste Liquid Treatment Building Option

Waste Type	*Cubic Yards*
Low-level radioactive waste (bulk)	4,860
Low-level radioactive waste (packaged)	1,620
Mixed low-level radioactive waste	44
Transuranic waste (contact-handled)	94
Demolition debris [a]	820
Construction waste [b]	980
Hazardous waste with asbestos	200
Solid hazardous waste with organics	< 1
Solid hazardous waste with metals	< 1

[a] Includes solid sanitary wastes.
[b] Includes 427 tons (387 metric tons) of solid waste from constructing evaporation tanks with associated pipeline. Construction waste density is 2 cubic yards per ton.
Note: To convert cubic yards to cubic meters, multiply by 0.76456.

Contact-handled transuranic waste would include small quantities of transuranic sludge that would be drummed, solidified, and transferred to TA-54 for eventual disposal at WIPP. DD&D may also generate waste from roofing materials that may contain asbestos and would require disposal at a permitted offsite facility, as well as possibly small quantities (less than 1 cubic yard [0.8 cubic meter]) of other wastes containing organics or metals. Otherwise, all potentially recyclable materials from construction or DD&D would be characterized; if contaminated with radioactive materials or chemicals, they would be disposed of at an appropriate permitted facility (LANL 2005f).

Facility construction, transitioning, and DD&D are expected to also generate small quantities of liquids that would be processed and disposed of in accordance with LANL requirements. Construction liquids are expected to include wash water from concrete trucks (less than 100 gallons [380 liters]). Transitioning liquids are expected to include 2,640 gallons (10,000 liters) of clean water used for testing the new process that would be processed through the existing Radioactive Liquid Waste Treatment Facility treatment system. Rinsing and flushing of the piping at the existing Radioactive Liquid Waste Treatment Facility would be treated at the new or the existing facility. Any remaining treated effluent would be evaporated assuming the auxiliary action options discussed in Section G.4.2.5 are implemented; otherwise the effluent would be released to the outfall in Mortandad Canyon.

Operations Impacts—Operations would generate liquid effluent, transuranic waste, and low-level radioactive waste. The volumes of waste generated would be a function of the level of operations occurring at LANL; these volumes are presented in Chapter 5, Section 5.9 of this SWEIS.

Transportation

Pecos Drive, a secondary road that intersects Pajarito Road, provides access to TA-55, TA-50, and TA-35. Traffic is restricted to the LANL workforce and official visitors. Sufficient parking is available to accommodate the existing workforce on the site.

Construction Impacts—Construction would result in some local adverse transportation effects. Construction traffic would increase temporarily. Parking would be eliminated by construction of the new facility.

Operations Impacts—Implementation of this option would eliminate the need to ship radioactive waste to Tennessee, thus reducing the risks of waste transportation off site.

DD&D Impacts—As with construction, traffic on Pecos Road and employee parking would be disrupted during demolition. Demolition traffic would increase temporarily.

The generated construction and DD&D wastes would be transported to disposal sites, either at LANL TA-54 or an offsite location. Transportation has potential risks to workers and the public from incident-free transport, such as radiation exposure as the waste packages are transported long the routes and highways. Traffic accidents could result both in injuries or deaths from collisions and in an additional radiological dose to the public from radioactivity that may be released during the accident.

The effects of incident-free transportation of construction and DD&D wastes on the worker population and general public is presented in **Table G–26**. Effects are presented in terms of the collective dose in person-rem resulting in excess LCFs. Excess LCFs are the number of cancer fatalities that may be attributable to the proposed project, estimated to occur in the exposed population over the lifetimes of the individuals. If the number of LCFs is smaller than one, the subject population is not expected to incur any LCFs resulting from the actions being analyzed.

The risk for development of excess LCFs is highest for the workers under the offsite disposition option. This is because the dose is proportional to the duration of transport, which in turn is proportional to travel distance. As shown in Table G–26, disposal of low-level radioactive waste at the Nevada Test Site, which is located farthest from LANL, would lead to the highest dose and risk, although the dose and risk are low for all disposal options.

Table G–26 Incident-Free Transportation – for Single Liquid Waste Treatment Building Option Impacts

Disposal Option	Low-Level Radioactive Waste Disposal Location [a]	Crew		Public	
		Collective Dose (person-rem)	Risk (LCF)	Collective Dose (person-rem)	Risk (LCF)
Onsite disposal	LANL TA-54	0.26	0.000155	0.082	0.000049
Offsite disposition	Nevada Test Site	2.02	0.0012	0.59	0.00036
	Commercial facility	1.96	0.0012	0.58	0.00035

LCF = latent cancer fatality, TA = technical area.
[a] Transuranic wastes would be disposed of at WIPP.

Table G–27 presents the impacts of traffic and radiological accidents. This table provides population risks in terms of fatalities due to traffic accidents from both the collisions themselves and from excess LCFs from exposure to releases of radioactivity. The analyses assumed that all transuranic and nonradioactive wastes would be transported to offsite disposal facilities.

Table G–27 Transportation Accident Impacts – for Single Liquid Waste Treatment Building Option

Low-Level Radioactive Waste Disposal Location [a, b]	Number of Shipments [c]	Distance Traveled (million kilometers)	Accident Risks	
			Radiological (excess LCFs)	Traffic (fatalities)
LANL TA-54	462	0.057	3.6×10^{-10}	0.00089
Nevada Test Site	462	1.04	5.2×10^{-8}	0.0106
Commercial facility	462	0.94	3.9×10^{-9}	0.0095

LCF = latent cancer fatality, TA = technical area.
[a] All nonradiological wastes would be transported off site.
[b] Transuranic wastes would be disposed of at WIPP.
[c] Approximately 87.7 percent of shipments are radioactive wastes. Others include 10 percent industrial and sanitary wastes and about 2.4 percent asbestos and hazardous wastes.
Note: To convert kilometers to miles, multiply by 0.6214.

Because all estimated LCFs and traffic fatalities, as shown in Tables G–26 and G–27, are much less than 1.0, the analysis indicates that no excess fatal cancers would result from this activity, either from dose received from packaged waste on trucks or potentially received from traffic collisions and accidental release.

G.4.3.3 Option 2: Two Liquid Waste Treatment Buildings Option

The overall effect of implementing this option would be positive. Effects on land use, cultural resources, ecological resources, human health, and infrastructure are expected to be similar to those under the proposed project (Option 1). Resource area impacts that would differ from the proposed project are discussed in detail below.

Land Resources—Visual Resources

As noted previously in the land use discussion, the area in which the treatment buildings would be constructed is highly developed. This area currently has an industrial look, with a mix of buildings of different design. The area proposed for construction of the tanks is currently undeveloped and wooded.

Construction Impacts—There would be temporary local visual impacts associated with construction of the new treatment buildings and during excavation from the use of construction equipment. The current natural setting, in the area of the evaporation tanks and a portion of the pipeline, would be disrupted by removal of vegetation, establishment of a construction staging area, and construction activities. Construction would entail excavation of soils to construct the tanks and pipeline, and possibly the temporary establishment of a soil pile. Excess soils would be removed and used or stockpiled elsewhere.

Operations Impacts—The new treatment buildings would not result in a change to the overall visual character of the area within TA-50. Buildings would be a maximum of two stories and constructed in accordance with site guidelines, which establish acceptable color schemes for building exteriors. Establishment of evaporation tanks would result in a permanent change to the visual environment in the area near the border of TA-52 and TA-5. Impacts would be similar to those described for Option 1 (see Section G.4.3.2). Following regrowth of vegetation, the area disturbed for pipeline construction would not be noticeable.

DD&D Impacts—Removal of the North and East Annexes and TA-50-66 would result in temporary local visual impacts in the form of construction equipment and the presence of partially demolished buildings. Long-term effects would be a slightly improved local visual environment, once the annexes and TA-50-66 are gone.

Geology and Soils

Construction Impacts—About 80,000 cubic yards (61,000 cubic meters) of soil and rock would be disturbed during building construction; installation of the evaporation tanks and pipeline would disturb the same quantities of soil and rock as those given for Option 1.

This option would initiate removal of some potential release sites and would have a positive effect. This option would be likely to affect more potential release sites than would the proposed project because of its larger footprint.

DD&D Impacts—The major indirect impact on geologic and soil resources at DD&D locations would be associated with the need to excavate any contaminated soil and tuff from beneath and around facility foundations. Under this option, the North and East Annexes and TA-50-66 would be demolished and remediation of associated potential release sites would be required. Borrow material such as crushed tuff and soil would be required to fill the excavations to grade, but such resources would be available from onsite borrow areas (see Chapter 5, Section 5.2 of this SWEIS). Potentially affected contaminated areas would be surveyed to determine the extent and nature of any contamination. All excavated contaminated media would be characterized and managed according to waste type and all LANL procedures and regulatory requirements.

Water Resources

DD&D Impacts—Effects on water quality could be larger under this option because more demolition is proposed under this option. However, erosion control measures specified in a stormwater pollution prevention plan would be implemented to mitigate impacts of sediment movement by stormwater. Water quality effects would be similar to those under Option 1.

Air Quality

DD&D Impacts—Nonradioactive emissions would be slightly larger under this option because the amount of demolition is greater. Other air quality impacts would be similar to those under Option 1.

Ecological Resources

Possible impacts would be the same as those for Option 1.

Human Health

Construction Impacts—Option 2 would result in somewhat larger worker hours and risks than would Option 1. Based on 317,000 worker hours, 4 to 13 recordable injuries could occur during construction (DOE 2004, BLS 2003). If the evaporation tanks and pipeline were built, an additional 420,000 person-hours would be required, with a possibility of 5 (DOE 2004) to 18 (BLS 2003) recordable injuries.

DD&D Impacts—Under this option, workers could potentially be exposed to radiologically or chemically contaminated materials during demolition activities. Worker risks would be mitigated by use of personal protective equipment and pre-established safety procedures. Based on an estimated 59,800 worker hours and construction accident rates, one to three recordable injuries could occur from DD&D (DOE 2004, BLS 2003).

Operations Impacts—Impacts would be the same as those for Option 1.

Cultural Resources

Construction Impacts—Under this option, effects of construction on cultural resources would be the same as those for Option 1.

Operations Impacts—This option would result in minimal effects on historic buildings. The original portion of the Radioactive Liquid Waste Treatment Facility would remain, but would undergo internal changes such as process equipment removal. As required by mitigation plans, documentation would occur before any equipment is removed from the building. Mitigation plans would have to be implemented before or during project implementation.

DD&D Impacts—Removal of the North and East Annexes to the Radioactive Liquid Waste Treatment Facility and TA-50-66 under this option should not affect the original historic fabric of the building, hut would require historic documentation before the demolition process began.

Socioeconomics and Infrastructure

Construction Impacts—Construction of the new buildings would require more infrastructure resources than Option 1. Construction is estimated to require 420,000 gallons (1.6 million liters) of liquid fuels and 2.3 million gallons (8.7 million liters) of water. If the evaporation tanks and pipeline were constructed, then similar impacts to those described in Option 1 would occur. The existing LANL infrastructure would be capable of supporting Option 2 without exceeding site capacities.

Operations Impacts—Electricity and natural gas requirements would be slightly more than Option 1 since additional new buildings would be operating. This would increase the use of utilities for lighting and heating as compared to Option 1.

DD&D Impacts—Activities associated with facilities to be replaced by the new facilities in Option 2 would be similar to those described in Option 1. However, the infrastructure needs for Option 2 would be somewhat higher than for Option 1 because one additional annex would be removed. DD&D is estimated to require quantities of liquid fuel and water similar to those in Option 1.

Waste Management

Waste types are expected to be similar to those under the proposed project. **Table G–28** provides the types and volumes of wastes generated during construction, transition, and demolition of buildings. Uncontaminated construction waste volumes would be larger than those under the proposed project because two or more new treatment facilities would be built. Transition and standdown wastes would be identical to those under the proposed project (Option 1). Volumes of demolition wastes would be greater than those under the proposed project because of the additional demolition of the North Annex. Operational waste is expected to be similar to that under the proposed project. Chemical and radioactive wastes generated through decontamination processes would be managed within the LANL waste management system. The low-level radioactive waste may be disposed of onsite or sent to an offsite facility, depending upon onsite capacities and waste acceptance priorities at TA-54 Area G. Solid wastes would be transferred to a permitted municipal landfill.

Operations Impacts—Operations would generate liquid effluent, transuranic waste, and low-level radioactive waste. The volumes of waste generated would be a function of the level of operations occurring at LANL; these volumes are presented in Chapter 5, Section 5.9, of this SWEIS.

Transportation

Pecos Drive, a secondary road that intersects Pajarito Road, provides access to TA-55, TA-50, and TA-35. Traffic is currently restricted to the LANL workforce and official visitors along Pecos Drive. Sufficient parking is available to accommodate the existing workforce in the area.

Construction Impacts—Traffic on Pecos Road and employee parking would be disrupted during construction. Pecos Road would be realigned slightly near the new low-level radioactive waste treatment buildings, but would not alter traffic flow over the long term. Traffic associated with construction would cause a temporary increase in local traffic.

Table G–28 Construction and Decontamination, Decommissioning, and Demolition Waste Volumes – Two Liquid Waste Treatment Buildings Option

DD&D Waste Type	*Cubic Yards*
Low-level radioactive waste (bulk)	5,250
Low-level radioactive waste (packaged)	1,750
Mixed low-level radioactive waste	44
Transuranic waste (contact-handled)	94
Demolition debris [a]	1,650
Construction waste [b]	1,110
Hazardous waste with asbestos	210
Solid hazardous waste with organics	< 1
Solid hazardous waste with metals	< 1

DD&D = decontamination, decommissioning, and demolition.
[a] Includes solid sanitary wastes.
[b] Includes 427 tons (387 metric tons) of solid waste from constructing evaporation tanks. Construction waste density is 2 cubic yards per ton (1.4 cubic meters per metric ton).
Note: To convert cubic yards to cubic meters, multiply by 0.76456.

Operations Impacts—Under this option, there would be no change in local traffic. Implementation of the proposed treatment technologies would eliminate the need to ship radioactive waste to and receive residues back from Tennessee, thus reducing the risks of offsite waste transportation.

The waste generated by construction and DD&D activities would have to be moved to a different location for disposal, mostly using over-the-road truck transportation. Effects of incident-free and accident conditions of transporting construction and DD&D wastes to disposal locations on or off site are presented in **Tables G–29** and **G–30**. All nonradiological and transuranic wastes would be transported to offsite facilities. The results in these two tables indicate that no traffic fatalities or excess LCFs are expected from transportation of generated wastes.

Table G–29 Incident-Free Transportation Impacts – Two Liquid Waste Treatment Buildings Option

		Crew		*Public*	
Disposal Option	*Low-Level Radioactive Waste Disposal Location* [a]	*Collective Dose (person-rem)*	*Risk (LCF)*	*Collective Dose (person-rem)*	*Risk (LCF)*
Onsite disposal	LANL TA-54	0.26	0.000156	0.082	0.000049
Offsite disposal	Nevada Test Site	2.16	0.0013	0.63	0.00038
	Commercial facility	2.10	0.00126	0.62	0.00037

LCF = latent cancer fatality, TA = technical area.
[a] Transuranic waste would be disposed of at WIPP.

Table G–30 Transportation Incident Impacts – Two Liquid Waste Treatment Building Option

Low-Level Radioactive Waste Disposal Location [a, b]	*Number of Shipments* [c]	*Distance Traveled (10^6 kilometers)*	*Accident Risks*	
			Radiological (excess LCFs)	*Traffic (fatalities)*
LANL [b]	540	0.076	3.6×10^{-10}	0.0011
Nevada Test Site	540	1.14	5.6×10^{-8}	0.0117
Commercial facility	540	1.03	4.2×10^{-9}	0.0105

LCF = latent cancer fatality.
[a] All nonradiological wastes would be transported offsite.
[b] Transuranic waste would be disposed of at WIPP.
[c] Approximately 81 percent of these are radioactive. Others include 17 percent industrial and sanitary waste and about 2 percent asbestos and hazardous waste.
Note: To convert kilometers to miles, multiply by 0.6214.

G.4.3.4 Option 3: Two Liquid Waste Treatment Buildings and Renovation Option

Under this option, the effects on ecological resources would be similar to those under the proposed project (Option 1). Resource area impacts that would differ from the proposed project are discussed in detail below.

Land Resources – Visual Resources

Activities in this option would be the same as those conducted in Option 2, with the additional renovation of a portion of the existing facilities. The renovated structure would have new external walls that would have color schemes that would match the new structures built as part of Option 2. Local visual impacts would therefore be similar to those described for Option 2.

Geology and Soils

About 95,000 cubic yards (73,000 cubic meters) of soil would be disturbed during building construction. Installation of the evaporation tanks and pipeline would disturb the same quantities of soil and rock as those given for Option 1.

This option would have a long-term positive effect by removing contaminated materials. More demolition would occur under this option than under Options 1 or 2, and a larger area of the associated potential release sites could be disturbed. More contaminated materials would be removed under this option. Contaminated material from demolition and construction would be managed according to waste type and LANL procedures. The long-term potential for spread of air- and waterborne contamination would he reduced.

Water Resources

Effects on water quality could be larger than those under Option 1 because more demolition is proposed under this option. However, implementing sediment and erosion control measures is expected to control possible consequences. Other water quality effects would be similar to those under Option 1.

EXHIBIT

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Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Water Quality & RCRA (ENV-RCRA)
P.O. Box 1663, Mail Stop K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX (505) 667-5224

Date: May 14, 2007
Refer To: ENV-RCRA: 07-097
LA-UR: 07-3266

Ms. Sonia Hall
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: NOTICE OF CHANGED CONDITION AT NPDES OUTFALL 051, NPDES PERMIT NO. NM0028355

Dear Ms. Hall:

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the permittee to notify the U. S. Environmental Protection Agency (EPA) regarding any planned physical alterations or additions to a NPDES permitted facility that could significantly change the nature or increase the quantity of pollutants discharged. The Laboratory's Radioactive Waste Treatment Facility (RLWTF) is planning to construct three new concrete evaporation tanks at Technical Area 52 to receive fully treated radioactive liquid effluent from RLWTF. These tanks are being constructed to reduce the volume of treated effluent being discharged through NPDES Outfall 051. Each tank will cover approximately one surface acre. The transfer line from the RLWTF to the tanks will be approximately 0.75 mile long. A copy of the proposed site location is enclosed for your review (Enclosure 1). Final drawings and specifications will be provided when completed.

Since the new evaporation tanks will be part of an existing wastewater treatment facility (i.e., RLWTF) which discharges under an NPDES permit, they will be exempt from RCRA permitting requirements pursuant to 40 CFR 264.1(g)(6) ("The requirements of this part do not apply to . . (6) The owner or operator of . . . a wastewater treatment unit . . .").

We intend to submit a detailed letter to the New Mexico Environment Department in the near future regarding these issues. We will provide your office with a copy of this correspondence.

Please contact Marc Bailey of the Laboratory's Water Quality and RCRA Group (ENV-RCRA) at (505) 665-8135, if you have any questions.

Sincerely,

A. R. Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA (ENV-RCRA) Group

ARG:MB/lm

Enclosures: a/s

Cy: Isaac Chen, USEPA Region VI, Dallas, TX, w/enc.
Marcy Leavitt, NMED/SWQB, Santa Fe, NM, w/enc.
Robert George, NMED/GWQB, Santa Fe, NM, w/enc.
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Gene Turner, NNSA/LASO, w/o enc., MS A316
Richard V. Bynum, PADOPS, w/o enc., MS A102
Richard S. Watkins, ADESHQ, w/o enc., MS K491
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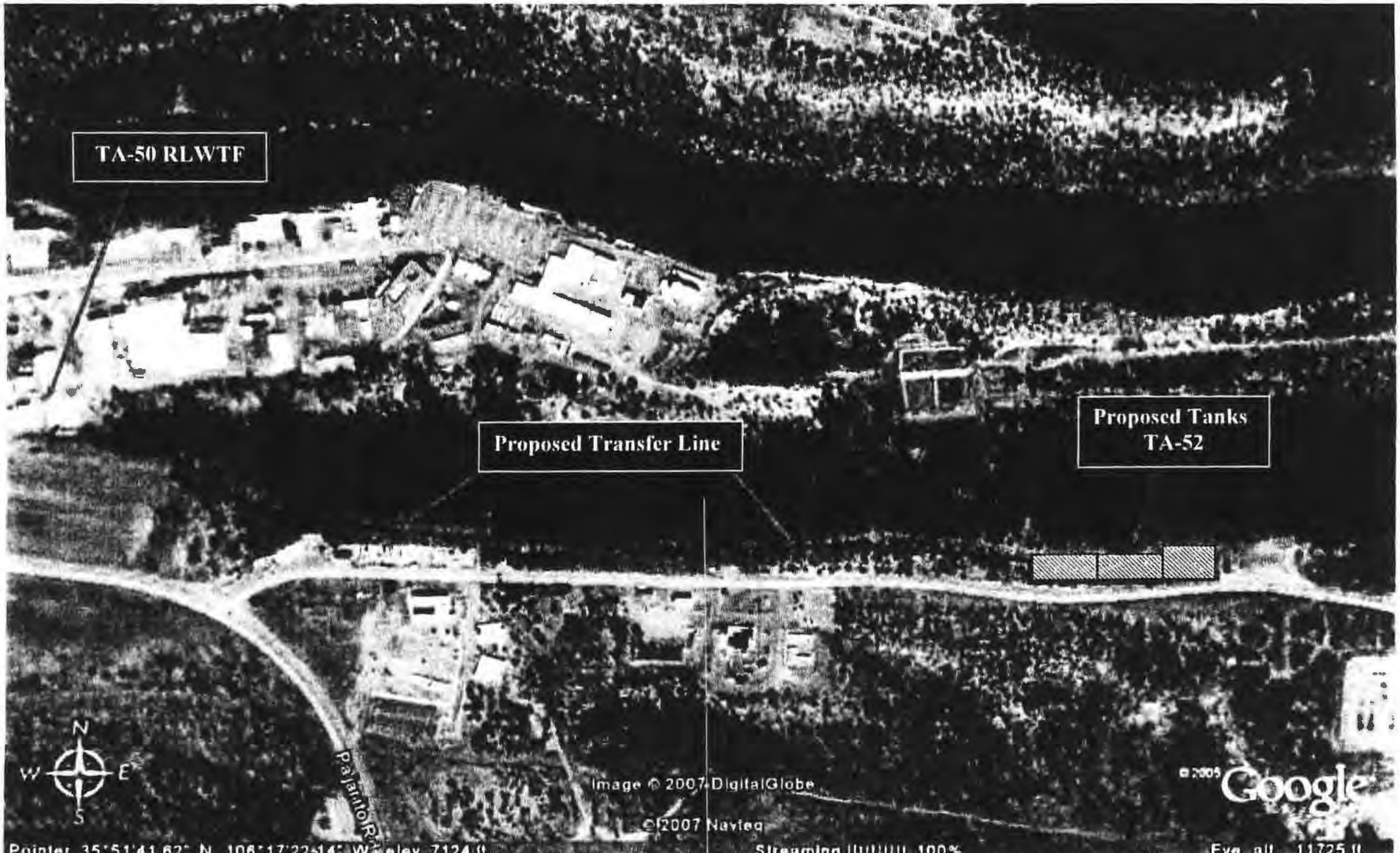
Mike Saladen, ENV-RCRA, w/o enc., MS K490
Bob Beers, ENV-RCRA, w/enc., MS K490
Marc Bailey, ENV-RCRA, w/enc., MS K490
Pete Worland, EWMO-RLW, w/enc., MS E518
Dave Moss, RLW, w/enc., MS E518
Phil Wardwell, LC-LESH, w/o enc., MS A187
ENV-RCRA, File, w/enc., MS K490
IRM-RMMSO, w/enc., MS A150

ENCLOSURE 1

NPDES PERMIT NO. NM0028355
Proposed RLWTF Concrete Evaporation Tanks



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Notices

Reporter

73 FR 55833

Federal Register 2008 September Friday, September 26, 2008 Notices DEPARTMENT OF ENERGY (DOE) -- National Nuclear Security Administration

Title: Record of Decision: Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, NM

Action: Record of decision.

Agency

DEPARTMENT OF ENERGY (DOE) > National Nuclear Security Administration

Synopsis

SUMMARY: The National Nuclear Security Administration (NNSA) of the U.S. Department of Energy (DOE) is issuing this Record of Decision (ROD) for the continued operation of the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico. This ROD is based on information and analyses contained in the *Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico,* DOE/EIS-0380 (Final SWEIS or 2008 SWEIS) issued on May 16, 2008; comments on the SWEIS; and other factors, including costs, security considerations and the missions of NNSA.

In the 2008 SWEIS, NNSA assessed three alternatives for the continued operation of LANL:

(1) No Action, (2) Reduced Operations, and (3) Expanded Operations. The No Action Alternative analyzed in this SWEIS consists of NNSA and LANL continuing to implement earlier decisions based on previous National Environmental Policy Act (NEPA) reviews, including the 1999 LANL SWEIS (DOE/EIS-0238) and its ROD (64 FR 50797, Sept. 20, 1999). The 2008 SWEIS identified the Expanded Operations Alternative as NNSA's Preferred Alternative. The SWEIS includes a classified appendix that assesses the potential environmental **[55834]** impacts of a representative set of credible terrorist scenarios.

Because NNSA is continuing to evaluate significant technical and national security issues that could affect the operation and missions of LANL, NNSA is making only a few decisions at this time regarding the continued operation of the laboratory. NNSA will not make any decisions regarding nuclear weapons production and other actions analyzed in the Complex Transformation Supplemental Programmatic Environmental Impact Statement (DOE/EIS-0236-S4) (Complex Transformation SPEIS or SPEIS) prior to the completion of the SPEIS. However, NNSA must make some decisions now regarding LANL to support the safe and successful execution of the laboratory's current missions. It is likely that NNSA will issue other RODs regarding the continued operation of LANL based on the 2008 SWEIS, the SPEIS and other NEPA analyses.

NNSA has decided to continue to implement the No Action Alternative with the addition of some elements of the Expanded Operations Alternative. These elements include increases in operation of some existing facilities and new facility projects needed for ongoing programs and protection of workers and the environment. For the most part, NNSA will continue the missions conducted at LANL at current levels at this time. NNSA will also continue to implement actions necessary to comply with the March 2005 Compliance Order on Consent (Consent Order), which requires investigation and remediation of environmental contamination at LANL. NNSA will not change pit production at LANL at this time; the 1999 ROD set pit production at LANL at 20 per year.

Text

SUPPLEMENTARY INFORMATION:

Background

NNSA prepared this ROD pursuant to the regulations of the Council on Environmental Quality (CEQ) for implementing NEPA (40 CFR Parts 1500-1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021). DOE last issued a SWEIS and ROD for the continued operation of LANL in 1999. DOE's NEPA regulations require that the Department evaluate site-wide NEPA analyses every five years to determine their continued applicability; NNSA initiated such an evaluation of the 1999 SWEIS in 2004. It subsequently decided to prepare a new SWEIS. NNSA issued a Draft SWEIS in July 2006 for public review and comment during a 75-day period. It considered the comments received on the Draft SWEIS in preparing the Final SWEIS, which it issued on May 16, 2008.

LANL is a multidisciplinary, multipurpose research institution in north-central New Mexico, about 60 miles (97 kilometers) north-northeast of Albuquerque, and about 25 miles (40 kilometers) northwest of Santa Fe. LANL occupies approximately 25,600 acres (10,360 hectares), or 40 square miles (104 square kilometers). About 2,000 structures, with a total of approximately 8.6 million square feet under roof, house LANL operations and activities, with about one half of the area used as laboratory or production space, and the remainder used for administrative, storage, services, and other purposes.

LANL is one of NNSA's three national security laboratories. Facilities and expertise at LANL are used to perform science and engineering research; the laboratory also manufactures some nuclear weapons components such as plutonium pits. In addition to weapons component manufacturing, LANL performs weapons testing, stockpile assurance, component replacement, surveillance, and maintenance. LANL's research and development activities include high explosives processing, chemical research, nuclear physics research, materials science research, systems analysis and engineering, human genome mapping, biotechnology applications, and remote sensing technologies. The main role of LANL in the fulfillment of NNSA and DOE missions is scientific and technological work that supports nuclear materials handling, processing, and fabrication; stockpile management; materials and manufacturing technologies; nonproliferation programs; and waste management activities. Work at LANL is also conducted for other Federal agencies such as the Departments of Defense and Homeland Security, as well as universities, institutions, and private entities.

Alternatives Considered

The alternatives NNSA evaluated in the SWEIS span a range of operations from minimum levels that would maintain essential mission capabilities (Reduced Operations Alternative) through the highest reasonably foreseeable levels that could be supported by current or new facilities (Expanded Operations Alternative). The No Action Alternative evaluated in the SWEIS consists of the continued implementation of decisions announced in the 1999 SWEIS ROD and decisions based on other completed NEPA reviews. The Reduced Operations Alternative assumes a reduction in the levels of certain operations and activities from the levels evaluated in the No Action Alternative. The Expanded Operations Alternative includes activities evaluated in the No Action Alternative, increases in overall operational levels, and new projects that fall into three categories: (1) Projects to maintain existing operations and capabilities (such as projects to replace aging structures with modern ones, and projects to consolidate operations and eliminate unneeded structures); (2) projects that support environmental remediation at LANL and compliance with the Consent Order, including demolition of excess buildings; and (3) projects that add new infrastructure and expand existing capabilities.

Compliance With the Consent Order

NNSA and LANL will continue to implement actions necessary to comply with the Consent Order, which requires the investigation and remediation of environmental contamination at LANL, regardless of the alternative it selects for the continued operation of the laboratory. The 2008 SWEIS analyzes the environmental impacts of actions **[55835]** required under the Consent Order, n1 and actions proposed by NNSA to facilitate its compliance with the Order (such as replacement of waste management structures, and establishment of waste examination and staging areas) under the Expanded Operations Alternative so that the impacts of these actions can be distinguished from the impacts of other proposed actions.

n1 The Consent Order was issued by the New Mexico Environment Department (NMED). As NMED makes the decisions regarding the requirements of the Order, these decisions are not subject to NEPA because they are not "federal actions."

Preferred Alternative

The preferred alternative is the alternative that NNSA believes would best fulfill its statutory mission responsibilities while giving consideration to economic, budget, environmental, schedule, policy, technical and other information. In both the Draft and the Final SWEIS, NNSA identified the Expanded Operations Alternative as its preferred alternative.

Environmentally Preferable Alternative

NEPA's Section 101 (42 U.S.C. 4331) establishes a policy of federal agencies having a continuing responsibility to improve and coordinate their plans, functions, programs and resources so that, among other goals, the nation may fulfill its responsibilities as a trustee of the environment for succeeding generations. The Council on Environmental Quality (CEQ), in its "Forty Most Asked Questions Concerning CEQ's NEPA Regulations" (46 FR 18026, Feb. 23, 1981), defines the "environmentally preferable alternative" as the alternative "that will promote the national environmental policy expressed in NEPA's Section 101."

The analyses in the SWEIS of the environmental impacts associated with operating LANL identified only minor differences among the three alternatives across natural and cultural resource areas. Within each of the alternatives there are actions that could result in negative impacts, as well as those that would produce positive environmental effects. Considering the many environmental facets of the alternatives analyzed in the SWEIS, and looking out over the long term, NNSA believes that implementation of the Expanded Operations Alternative would allow it to best achieve its environmental trustee responsibilities under Section 101 of NEPA. Facilitating the cleanup of the site with new or expanded waste management facilities, and replacing older laboratory and production facilities with new buildings that incorporate modern safety, security and efficiency standards, would improve LANL's ability to protect human health and the environment while allowing LANL to continue to fulfill its national security missions. Increasing operational levels and performing various demolition activities would use additional resources and generate additional waste, but NNSA would also undertake actions to modernize and replace older facilities with more energy efficient and environmentally-protective facilities and to implement waste control and environmental practices to minimize impacts. Many of these types of actions are not feasible with the outdated infrastructure currently at LANL. Under this alternative, NNSA would be better positioned to minimize the use of electricity and water, streamline operations through consolidation, reduce the "footprint" of LANL as a whole, and allow some areas to return to a natural state.

NNSA's Responsibilities to Tribal Governments

NNSA recognizes that the operation of LANL over the last 65 years has affected the people of neighboring communities in northern New Mexico, including Tribal communities. These effects, which vary in nature across communities, include alterations of lifestyles, community, and individual practices. With respect to Tribal communities, NNSA adheres to federal statutes such as the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, and the National Historic Preservation Act. NNSA follows Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Executive Order 13007, *Indian Sacred Sites*; Executive Order 13021, *Tribal Colleges and Universities*; and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. NNSA also follows the 2004 Presidential Memorandum regarding Government-to-Government Relationships with Native American Tribal Governments, DOE's American Indian and Alaska Native Tribal Government Policy, DOE Order 1230.2 and DOE Notice 144.1, which establish principles and policies for the Department's relations with Tribes. NNSA has established cooperative agreements with Tribal nations that are located near NNSA sites to enhance their involvement in environmental restoration while protecting Tribal rights and resources.

Four Pueblo governments in the vicinity of LANL have signed individual Accord Agreements with NNSA (Santa Clara, San Ildefonso, Cochiti, and Jemez). The Accord Agreements, together with the recently established Environmental Management/NNSA tribal framework, provide a basis for conducting government-to-government relations and serve as a foundation for addressing issues of mutual concern between the Department and the Pueblos. In furtherance of these Accord Agreements, and specifically to address concerns and issues raised by the Santa Clara Pueblo, the implementation of the decisions in this ROD will be undertaken in conjunction with a Mitigation Action Plan (MAP), which will be updated as needed to address specific concerns and issues raised by the Santa Clara and other Tribal communities.

Environmental Impacts of Alternatives

NNSA analyzed the potential impacts of each alternative on land use; visual resources; site infrastructure; air quality; noise; geology and soils; surface and groundwater quality; ecological resources; cultural and paleontological resources; socioeconomics; human health impacts; environmental justice; and waste management and pollution prevention. NNSA also evaluated the impacts of each alternative as to irreversible or irretrievable commitments of resources, and the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. In addition, it evaluated impacts of potential accidents at LANL on workers and surrounding populations. In a classified appendix, NNSA also evaluated the potential impacts of intentional destructive acts that might occur at LANL.

The 2008 SWEIS's impact analyses for normal operations (i.e., operations without accidents or intentional destructive acts) identified the most notable differences in potential environmental impacts among the alternatives in the following resource areas: *geology and soils; radiological air quality; human health; site infrastructure (electric power use, natural gas demand, potable water demand, and waste management demands); and transportation*. It also identified minor differences in potential environmental impacts among the alternatives under normal operations for: *land use; visual environment; surface water resources; groundwater resources; non-radiological air quality; noise levels; ecological resources; cultural resources; and socioeconomics.* **[55836]** These findings are described in the Summary and Chapters 4 and 5 of the SWEIS.

Environmental justice was an impact area of particular concern among those who commented on the SWEIS. NNSA recognizes that the operation of LANL over the last 65 years has affected the people of neighboring communities, including minority and low-income households. These effects, which vary in nature across communities, include alterations of lifestyles, community, and individual practices. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires every Federal agency to analyze whether its proposed actions and alternatives would have disproportionately high and adverse impacts on minority or low-income populations. Based on the impacts analysis, NNSA expects no disproportionately high and adverse impacts on minority or low-income populations from the continued operation of LANL under any of the alternatives. From the analysis conducted of the alternatives, the radiological dose from emissions from normal operations are slightly lower for members of Hispanic, Native American, total minority, and low-income populations than for members of the population that are not in these groups, mainly because of the locations of these populations relative to the operations at LANL that produce these emissions. The maximum annual dose for the average member of any of the minority or low-income populations is estimated to be 0.092 millirem compared to a dose of 0.10 millirem for a member of the general population, and a dose of 0.11 millirem for a member of the population that does not belong to a minority or low-income group.

NNSA also analyzed human health impacts from exposure through special pathways, including subsistence consumption of native vegetation (pinon nuts and Indian Tea [Cota]), locally grown produce and farm products, groundwater, surface waters, fish (game and nongame), game animals, other foodstuffs and incidental consumption of soils and sediments (on produce, in surface water, and from ingestion of inhaled dust). These special pathways can be important to the environmental justice analyses because some of them may be more important or prevalent as to the traditional and cultural practices of members of minority populations in the area. The analyses conducted for the 2008 SWEIS, however, show that the health impacts associated with these special pathways do not result in disproportionately high and adverse impacts to minority or low-income populations.

The SWEIS analyzed potential accidents at LANL. Bounding accidents for both nuclear materials handling and waste management operations and for chemical handling and waste management operations, were identified as those with the highest potential consequences to the offsite population under median site meteorological conditions. Chemicals of concern were selected from a database based on quantities, chemical properties, and human health effects. In making the decisions announced in this ROD, NNSA considered the potential accidents analyzed in the SWEIS for each of the three alternative levels of LANL operations. For the most part, there are few differences among the alternatives for the maximum potential wildfire, seismic, or facility operational accident at LANL because actions under each alternative do not, for the most part, affect the location, frequency, or material at risk of the analyzed accident scenarios. Potential accidents that could occur under the No Action Alternative could also occur under both the Reduced Operations and the Expanded Operations Alternatives. In general, TA-54 waste management operations dominate the potential radiological accident risks and consequences at LANL under all three alternatives.

Under both the No Action and the Reduced Operations Alternatives, the accident with the highest estimated consequences to offsite populations involving radioactive material or wastes is a lightning-initiated fire at the Radioassay and Nondestructive Testing Facility in TA-54. Such an accident could result in up to 6 additional latent cancer fatalities (LCFs) in the offsite population. A fire at the Plutonium Facility's material staging area located within TA-55 could result in up to 5 additional LCFs in the offsite population. The potential accident expected to result in the highest estimated consequences to the hypothetical maximally exposed individual (MEI) and a non-involved nearby worker would be a fire in a waste storage dome at TA-54. If that accident were to occur, a single LCF to a noninvolved worker located 110 yards (100 meters) away from the site of the accident would be likely, and there could also be a 1 in 2 likelihood (0.50) of a LCF to the MEI, who is assumed to be located at the nearest site boundary for the duration of the accident. The lightning-initiated fire accident at the Radioassay and Nondestructive Testing Facility could also result in a single LCF to a noninvolved worker located 110 yards (100 meters) away from the site of the accident, and could also result in about the same 1 in 2 likelihood (0.49) of a LCF to the MEI assumed to be located at the nearest boundary for the duration of the accident.

Under the Expanded Operations Alternative, there is a potential for a radiological accident unique to this alternative. The radiological accident most likely to result in the highest estimated consequences to the offsite population is a building fire involving radioactive sealed sources stored at the Chemistry and Metallurgy Research Building. Such an accident could result in up to 7 additional LCFs in the offsite population. The potential accident expected to result in the highest estimated consequences to the hypothetical MEI and a non-involved nearby worker would be the same as for the No Action Alternative, namely, a fire in a waste storage dome at TA-54.

DOE evaluates the exposure risks associated with chemicals of concern and the requirements for crisis response personnel to use personal protection to avoid potentially dangerous exposures through its system of Emergency Response Planning Guidelines (ERPG). Chemicals of concern in the analyzed accidents at LANL under both the No Action and Reduced Operations Alternatives include selenium hexafluoride and sulfur dioxide, both from waste cylinder storage at TA-54, and chlorine and helium gases located at TA-55. Annual risks of worker and public exposure in the event of chemical releases are greatest from chlorine and helium gases. The annual risk is estimated to be about one chance in 15 years for workers within 1,181 yards (1,080 meters) of the facility receiving exposures in excess of the ERPG limits for chlorine gas, with the nearest public access located at 1,111 yards (1,016 meters). The annual risk is estimated to be about one chance in 15 years for workers within 203 yards (186 meters) of the facility receiving exposures in excess of ERPG limits for helium gas, with the nearest public access at 1,146 yards (1,048 meters).

Cleanup activities of Material Disposal Areas (MDAs) are analyzed under the Expanded Operations Alternative. These activities pose a risk of accidental releases of toxic chemicals, as there is a degree of uncertainty about how much and what chemicals were disposed of in the MDAs. MDA B is the closest disposal area to the boundary of LANL that will require remediation; remediation by waste removal was assumed for the analysis of a bounding accidental chemical release. Sulfur **[55837]** dioxide gas and beryllium powder were chosen as the bounding chemicals of concern for this area based on their ERPG values. If present at MDA B in the quantities assumed, both of these chemicals would likely dissipate to safe levels very close to the point of their release. However, there is a potential risk to the public due to the short distance between MDA B and the nearest point where a member of the public might be.

Comments on the Final Site-Wide Environmental Impact Statement

NNSA distributed more than 1,030 copies of the Final SWEIS to Congressional members and committees, the State of New Mexico, Tribal governments and organizations, local governments, other Federal agencies, non-governmental organizations, and individuals. NNSA received comments on the Final SWEIS from the Santa Clara Indian Pueblo; the Members and Residents of Santa Clara Pueblo; Concerned Citizens for Nuclear Safety, together with Robert H. Gilkeson and the Embudo Valley Environmental Monitoring Group; Citizen Action New Mexico; Nuclear Watch New Mexico; Citizens for Alternatives to Radioactive Dumping, and from nearby farmers.

Comments on the Final SWEIS included issues already raised during the comment period for the Draft SWEIS. Volume 3 of the Final SWEIS contains all comments received on the Draft SWEIS and NNSA's responses to them; this chapter also describes how these comments resulted in changes to the SWEIS.

The Santa Clara Indian Pueblo identified three main areas of concern: (1) Government-to-government consultation should have taken place before the issuance of the Final SWEIS; (2) environmental justice issues (including cumulative impacts) were not analyzed properly in the Final SWEIS; and (3) going forward with an increase in plutonium pit production at this time would be premature and violate NEPA. In a letter signed by 226 individuals, the Members and Residents of the Santa Clara Pueblo stated their support for comments on the SWEIS submitted by the tribal leaders. They also stated their opposition to increased plutonium pit production and specifically asked "that (1) proper analysis of environmental justice and accumulative impacts be completed and circulated to the public for comments; (2) that NNSA/DOE honor government-to-government consultation and the process as a trust to Indian Tribes (Santa Clara Pueblo); and (3) that no decision about increasing plutonium pit production be made until review of this issue mandated in a new law (the National Defense Authorization Act for Fiscal Year 2008) is completed."

To the extent that Santa Clara Pueblo perceived NNSA's action in delaying government-to-government consultation until after the issuance of the Final SWEIS and before the issuance of this ROD to be inconsistent with appropriate protocol for such consultations, this was not intended. NNSA believes that it followed the requirements of DOE Order 1230.2, *U.S. Department of Energy American Indian and Alaska Native Tribal Government Policy*, in consulting through the formal government-to-government process with Santa Clara Pueblo prior to making the decisions announced in this ROD. However, given the two-year time period between the issuance of the Draft SWEIS in 2006 and the issuance of the Final SWEIS in 2008, NNSA acknowledges that it could have been more prompt in engaging in government-to-government consultation with the Santa Clara Pueblo. NNSA will work to improve its consultation process.

With regard to the impact analysis of environmental justice issues (including cumulative impacts) in the Final SWEIS, NNSA believes that it appropriately analyzed the potential for disproportionately high and adverse impacts to minority and low-income populations located within a 50-mile radius of LANL under all alternatives, and that it also appropriately analyzed cumulative impacts to the extent that future actions are known or foreseeable. However, NNSA recognizes that many of the concerns the Santa Clara expressed are rooted in protected cultural and religious practices of its people. With this in mind, NNSA will undertake implementation of the decisions announced in this ROD in conjunction with a MAP. The MAP will be updated as the need arises to identify actions that would address specific concerns and issues raised by the Santa Clara as well as those of other tribal entities in the area of LANL.

NNSA agrees that decisions at this time on proposed actions analyzed in the Complex Transformation SPEIS, including decisions regarding the number of plutonium pits LANL will produce, would be premature. NNSA will not make any decisions on pit production until after it completes the SPEIS.

Concerned Citizens for Nuclear Safety, together with Robert H. Gilkeson and the Embudo Valley Environmental Monitoring Group, raised several concerns with the Final SWEIS: issuance of the Final SWEIS is premature because there could be a future Congressional change in the purpose and need to operate LANL; there is an uncertain seismic hazard at LANL; the Final SWEIS does not comply with NEPA because it omitted an analysis of prime farmland; LANL does not have a reliable network of monitoring wells; radionuclides have been found in the drinking water wells of Los Alamos County, San Ildefonso Pueblo, and Santa Fe; and storm flow and sediment transport are primary mechanisms for potential contaminant transport beyond LANL's boundaries.

NNSA does not agree that issuance of the Final SWEIS and a ROD is premature. Should Congress or the President direct changes regarding the purpose and need to operate LANL, NNSA may need to conduct additional NEPA reviews or amend this ROD. Federal agencies always face the possibility that in the future the Congress or the President may direct changes in their missions and responsibilities. At this time, NNSA is making only a limited set of decisions regarding actions that need to be implemented now. These decisions do not limit or prejudice the decisions NNSA may make regarding the programmatic alternatives it is evaluating in the Complex Transformation SPEIS.

New information about seismic risks at LANL (set forth in the report *Update of the Probabilistic Seismic Hazard Analysis and Development of Seismic Design Ground Motions at the Los Alamos National Laboratory, 2007, LA-UR-07-3965*) may change how hazardous materials are stored, operations are conducted, and facilities are constructed or renovated. NNSA is conducting a systematic review of LANL structures and operations in light of this information. This review, expected to be completed in about one year, will identify any necessary changes to address the new seismic information. NNSA will then implement the necessary changes to

LANL facilities and operations based on the review's recommendations.

NNSA contacted the U.S. Department of Agriculture regarding prime farmland designations in northern New Mexico and included that information in Chapter 4 of the Final SWEIS. No farmland designated by that agency as "prime farmland" is located within Los Alamos or Santa Fe Counties, and only a limited amount of prime farmland is located within a 50-mile radius of LANL in Sandoval and Rio Arriba Counties. The Farmland Protection Policy Act requires that projects receiving Federal funds that would result in the **[55838]** permanent conversion of prime farmland to non-farmland (or remove its prime rating) must develop and consider alternatives that would not result in the conversion. None of the proposed actions at LANL under any of the alternatives would result in changes to any designated prime farmland or cause it to be re-designated as non-prime farmland.

Information about the network of monitoring wells, including existing and planned wells, is provided in Chapter 4 of the Final SWEIS. NNSA acknowledges that past well installation practices have not produced the desired network, and will continue to install and refurbish wells until adequate information is obtained regarding groundwater conditions and contaminant transport within the aquifers in the LANL area. Contaminants identified in various drinking water wells are being monitored, and drinking water production from these wells may be adjusted or discontinued in compliance with health protection standards. Additional study of aquifer conditions and contaminant transport is needed before long-term corrective actions can be identified and implemented. Contaminant transport via surface water flow and sediment transport is recognized as the primary mechanisms for off-site transport, especially after storms. As the watershed recovers from the effects of the Cerro Grande Fire in 2000, the volumes of storm water runoff are expected to decrease.

Citizen Action New Mexico stated its opposition to the Expanded Operations Alternative, especially expanded nuclear weapons research and production, and asserted that the Final SWEIS did not consider the increased impact of plutonium production on children in compliance with Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks.*

NNSA believes it has complied with this Executive Order in the Final SWEIS. NNSA now uses a more conservative dose-to-risk conversion factor in assessing risks of radiation exposures as a result of this Order. Use of the new dose-to-risk conversion factor is one of the changes noted in NNSA's NEPA process since the issuance of the 1999 SWEIS (Chapter 6 and Appendix C of the SWEIS). As noted previously, NNSA is not making any decisions at this time that would result in expansion of nuclear weapons production.

In comments on the Final SWEIS, Nuclear Watch New Mexico (NWNM) stated that: Expanded plutonium pit production is not necessary; potential impacts of the proposed Radiological Science Institute are not adequately analyzed in the Final SWEIS and that a project-specific EIS is necessary for the institute; waste volumes identified in the Final SWEIS do not reconcile with those in NNSA's Draft Complex Transformation Supplemental Programmatic EIS; there is confusion about whether the proposed Advanced Fuel Cycle Facility, which is the subject of another DOE programmatic EIS, *The Global Nuclear Energy Partnership Programmatic EIS* (the GNEP PEIS), would be used for research and development or for full-scale reprocessing (and the number of associated facilities that could be located at LANL); and the Los Alamos Science Complex should be funded through the traditional Congressional budgetary authorization and appropriation process.

NNSA believes that it appropriately analyzed the potential impacts of the Radiological Science Institute in the Final SWEIS to the extent possible at this stage of the project planning process, and acknowledged in the Final SWEIS that additional NEPA analyses may be necessary if NNSA decides to continue with this proposal. NNSA will reconcile and update waste volumes in the Final Complex Transformation SPEIS. DOE has decided to eliminate the Advanced Fuel Cycle Facility from consideration in the GNEP PEIS (for more information, please visit: *http://www.gnep.energy.gov*). NNSA is considering the use of alternative financing for the Los Alamos Science Complex; this is an appropriate financing approach in certain situations although it has been rarely used at LANL.

NWNM also asked for additional clarification of some of NNSA's responses to its comments on the Draft SWEIS and provided additional information regarding some of their previous comments. Specifically, NWNM asked if all current tests using plutonium at the Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) are conducted inside vessels.

At present, NNSA is not conducting any tests at DARHT that use plutonium, and future tests using plutonium at this facility would be conducted inside vessels.

NWNM asked if the Rendija Canyon Fault is the closest fault to the proposed location of the Radiological Science Institute.

As discussed in the Final SWEIS, it is the closest known fault to that location.

NWNM also requested an unclassified appendix that discusses intentional destructive acts at LANL; asserted there should be a citation to information compiled by the U.S. Department of Commerce's Bureau of Economic Analysis; and asked that the Area G Performance Assessment and Composite Analysis and the geotechnical report recently prepared by LANL be posted on the Internet.

NNSA considered the preparation of an unclassified discussion of the potential environmental impacts of intentional destructive acts at LANL, but concluded that such a discussion posed unacceptable security risks. Information used to prepare the economic impacts analysis was not contained within a discrete study, so a citation is not appropriate in this instance. Unclassified documents prepared by LANL are generally placed on its Internet site when completed and approved for distribution. NWNM may access the LANL Internet site for these specific references.

NWNM correctly pointed out that the Environmental Protection Agency (EPA) had designated the Espanola Basin as a Sole Source Aquifer in early 2008.

Once EPA designates a sole source aquifer under its Sole Source Aquifer Protection Program, the agency can review proposed projects that are to receive Federal funds and that have a potential to contaminate the aquifer. Under this review, EPA can request changes to a Federally-funded project if it poses a threat to public health by contaminating an aquifer to the point where a safe drinking water standard could be violated. Projects conducted entirely by Federal agencies, or their contractors, at sole source aquifer locations are not subject to EPA's review process. NNSA is not proposing any new projects that would cause the Espanola Basin aquifer to exceed a safe drinking water standard.

Citizens for Alternatives to Radioactive Dumping also commented on the Final SWEIS. It asserted that expanded pit production is not necessary; that contamination has been found in produce samples; that there is prime farm land in the Embudo Valley; that there are radionuclides in the Rio Grande, which is a threat to its use as drinking water by the city of Santa Fe; and that radioactive cesium has been found in soils at the Trampas Lakes, which drain into the Rio Grande.

As NNSA noted in its response to other comments on the Draft SWEIS, a single "false positive" result was returned from a laboratory analyzing fruit specimens grown near LANL. No uptake of radioactive contamination **[55839]** attributed to LANL operations has been found in produce samples obtained from the Embudo Valley. Drinking water supplies for Santa Fe must meet Safe Drinking Water Act and other state and municipal requirements. Elevated radionuclide concentrations in the soils of alpine lake basins within the Rocky Mountain range have been attributed to global fallout concentrated through snowfall and specific geomorphic conditions.

Decisions

With limited additions, NNSA has decided to continue operation of Los Alamos National Laboratory pursuant to the No Action Alternative analyzed in the 2008 SWEIS. The parameters of this alternative are set by the 1999 ROD and other decisions that NNSA has made previously regarding the continued operation of LANL. The additions to the No Action Alternative NNSA has decided to implement at this time consist of elements of the Expanded Operations Alternative. These elements are of two types: (1) Changes in the level of operations for on-going activities within existing facilities, and (2) new facility projects. The changes in operational levels NNSA has decided to implement at this time are:

- Supporting the Global Threat Reduction Initiative and Off-Site Sources Recovery Project by broadening the types and quantities of radioactive sealed sources (Co-60, Ir-192, Cf-252, Ra-226) that LANL can manage and store prior to their disposal;
- Expanding the capabilities and operational level of the Nicholas C. Metropolis Center for Modeling and Simulation to support the Roadrunner Super Computer platform;
- Performing research to improve beryllium detection and to develop mitigation methods for beryllium dispersion to support industrial health and safety initiatives for beryllium workers; and
- Retrieval and disposition of legacy transuranic waste (approximately 3,100 cubic yards of contact-handled and 130 cubic yards of remote-handled) from belowground storage.

New facility projects involve the design, construction, or renovation of facilities and were analyzed as part of the Expanded Operations Alternative. The facility projects that NNSA has decided to pursue at this time are:

- Planning, design, construction and operation of the Waste Management Facilities Transition projects to facilitate actions required by the Consent Order;
- Repair and replacement of mission critical cooling system components for buildings in TA-55 to enable the continued operation of these buildings and to comply with current environmental standards; and
- Final design of a new Radioactive Liquid Waste Treatment Facility, and design and construction of the Zero Liquid Discharge Facility component of this new treatment facility to enable LANL to continue to treat radioactive liquid wastes.

These projects and actions are needed on an immediate basis to maintain existing capabilities, support existing programs, and provide a safe and environmentally protective work environment at LANL. The need for these increases in operations and new facility projects exists regardless of any decisions NNSA may make regarding the programmatic and project-specific alternatives analyzed in the Complex Transformation SPEIS.

In addition, NNSA will continue to implement actions required by the Consent Order, as noted above, these decisions are not subject to NEPA.

Basis for Decision

NNSA's decisions are based on its mission responsibilities and its need to sustain LANL's ability to operate in a manner that allows it to fulfill its existing responsibilities in an environmentally sound, timely and fiscally prudent manner.

National security policies require NNSA to maintain the nation's nuclear weapons stockpile as well as its core competencies in nuclear weapons. Since completion in 1996 of the *Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) and associated ROD, NNSA and its predecessor, DOE's Office of Defense Programs, has implemented these policies through the Stockpile Stewardship Program (SSP). The SSP emphasizes development and application of improved scientific and technical capabilities to assess the safety, security, and reliability of existing nuclear warheads without the use of nuclear testing. LANL's operations support a wide range of scientific and technological capabilities for NNSA's national security missions, including the SSP. Most of NNSA's missions require research and development capabilities that currently reside at the LANL site. The nuclear facilities in LANL's TA-55 must maintain the nation's nuclear stockpile. Programmatic risks would be unacceptable if LANL did not continue to operate, or if it failed to implement the new decisions set forth above.

NNSA believes that, at this time, existing national security requirements can be met by continuing to conduct operations at current levels with only a limited number of increases in levels of operations and new facility projects. These increases in operations and new projects are needed because of changes in the SSP program and NNSA's nuclear non-proliferation program. They are also needed to meet new responsibilities that have arisen as a result of changes in our national security requirements since 1999. One of the new facility projects is needed to facilitate NNSA's compliance with the Consent Order. The specific rationales for NNSA's decisions to implement seven elements of the Expanded Operations Alternative are:

1. Supporting the Global Threat Reduction Initiative and Off-Site Sources Recovery Project by broadening the types and quantities of radioactive sealed sources (Co-60, Ir-192, Cf-252, Ra-226) that LANL can manage and store prior to their disposal--This decision will allow NNSA to retrieve and store more of these sources, which, if not adequately secured, could be used in a radiation dispersion device (a "dirty bomb").

2. Expanding the capabilities and operational level of the Nicholas C. Metropolis Center for Modeling and Simulation to support the Roadrunner Super Computer platform--This decision will allow NNSA to perform calculations that improve its ability to certify that the nuclear weapons stockpile is reliable without conducting underground nuclear tests. It will also allow LANL to conduct research on global energy challenges and other scientific issues.

3. Performing research to improve detection and mitigation methods for beryllium--This research will support the continued development of methods to capture and sequester beryllium and to expedite sample analysis needed to implement exposure controls to ensure worker safety.

4. Retrieval and disposition of legacy transuranic waste (approximately 3,100 cubic yards of contact-handled and 130 cubic yards of remote-handled) from belowground storage--Retrieving and dispositioning this waste will allow LANL to complete closure and remediation of TA-54 Material Disposal Area G under the Consent Order. This action will reduce risk by removing approximately 105,000 plutonium-239 equivalent curies from LANL.

5. Planning, design, construction and operation of the Waste Management Facilities Transition projects--These projects will replace LANL's existing facilities for solid waste management. The existing facilities at TA-54 for transuranic waste, low-level waste, mixed low-level waste and hazardous/ **[55840]** chemical waste are scheduled for closure and remediation under the Consent Order.

6. Repair and replacement of mission critical cooling system components for buildings in TA-55--This decision will allow these facilities to continue to operate and for NNSA to install a new cooling system that meets current standards regarding the phase-out of Class 1 ozone-depleting substances.

7. Final design of a new Radioactive Liquid Waste Treatment Facility, and design and construction of the Zero Liquid Discharge Facility component of this new treatment facility--This decision will allow LANL to continue to treat radioactive liquid wastes by replacing a facility that does not meet current standards and that cannot be acceptably renovated. Regardless of any decisions NNSA may make about complex transformation and LANL's role in it, the laboratory will need to treat liquid radioactive wastes for the foreseeable future.

Mitigation Measures

As described in the SWEIS, LANL operates under environmental laws, regulations, and policies within a framework of contractual requirements; many of these requirements mandate actions intended to control and mitigate potential adverse environmental effects. Examples include the Environment, Safety, and Health Manual, emergency plans, Integrated Safety

Management System, pollution prevention and waste minimization programs, protected species programs, and energy and conservation programs. A Mitigation Action Plan for this ROD will be issued that includes: Specific habitat conservation measures recommended by the U.S. Fish and Wildlife Service for mitigating effects to potential habitat areas; site- and action-specific commitments related to the Consent Order once the State of New Mexico decides on specific environmental remediation for LANL MDAs; and traffic flow improvements that could involve such measures as installing turn lanes, installing and coordinating traffic lights, and installing new signage. A summary of all prior mitigation commitments for LANL that are either underway or that have yet to be initiated will be included in the MAP. These prior commitments include such actions as continued forest management efforts, continued trail management measures, and implementation of a variety of sampling and monitoring measures, as well as additional measures to reduce potable water use and conserve resources.

In addition, with respect to the concerns raised by the Santa Clara Pueblo, NNSA will continue its efforts to support the Pueblo and other tribal entities in matters of human health, and will participate in various intergovernmental cooperative efforts to protect indigenous practices and locations of concern. NNSA will conduct government-to-government consultation with the Pueblo and other tribal entities to incorporate these matters into the MAP.

Issued at Washington, DC, this 19th day of September 2008.

Thomas P. D'Agostino,

Administrator, National Nuclear Security Administration.

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Contacts

FOR FURTHER INFORMATION CONTACT: For further information on the 2008 LANL SWEIS or this ROD, or to receive a copy of this SWEIS or ROD, contact: Ms. Elizabeth Withers, Document Manager, U.S. Department of Energy, National Nuclear Security Administration Service Center, Post Office Box 5400, Albuquerque, NM 87185, (505) 845-4984. Questions about the SWEIS, ROD and other issues regarding the Los Alamos Site Office's NEPA compliance program may also be addressed to Mr. George J. Rael, Assistant Manager Environmental Operations, NEPA Compliance Officer, U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Site Office, 3747 West Jemez Road, Los Alamos, NM 87544. Mr. Rael may be contacted by telephone at (505) 665-0308, or by e-mail at: *LASO.SWEIS@doeal.gov*. For information on the DOE NEPA process, contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-20), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-4600, or leave a message at (800) 472-2756. Additional information regarding DOE NEPA activities and access to many DOE NEPA documents are available on the Internet through the DOE NEPA

Web site at: *http://www.gc.energy.gov/nepa/*.

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Title: Record of Decision: Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, NM

Action: Record of decision.

Agency

DEPARTMENT OF ENERGY (DOE) > National Nuclear Security Administration

Synopsis

SUMMARY: The National Nuclear Security Administration (NNSA), a separately organized agency within the U.S. Department of Energy (DOE), is issuing this Record of Decision (ROD) for the continued operation of the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico, pursuant to the *Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico,* DOE/EIS-0380 (SWEIS) (73 FR 28453, May 16, 2008). This ROD is the second ROD based on the information and analyses contained in the SWEIS and other factors, including comments received on the SWEIS, costs, technical and security considerations, and the missions of NNSA. These decision factors also include results from the analyses in the October 24, 2008, *Final Complex Transformation Supplemental Programmatic Environmental Impact Statement* (DOE/EIS-

0236-S4, 73 FR 63460) (Complex Transformation SPEIS) and its two RODs (73 FR 77644, 73 FR 77656, December 19, 2008). NNSA issued the first ROD for the continued operation of LANL based on the SWEIS (73 FR 55833) on September 26, 2008.

In the LANL SWEIS, NNSA analyzed three alternatives for the continued operation of LANL: (1) No Action, (2) Reduced Operations, and (3) Expanded Operations. NNSA identified the Expanded Operations Alternative as its Preferred Alternative.

For this second ROD, NNSA continues to select the No Action Alternative, announced in the 2008 ROD as its decision for continuing the operation of LANL, and has decided to implement additional elements of the Expanded Operations Alternative. Specific projects that will be implemented under this ROD are: (1) Complete the environmental remediation and closure of Technical Area 18 (TA-18) Pajarito Site; (2) complete the environmental remediation and closure of TA-21 (also referred to as the Delta Prime or DP Site); (3) refurbish the Plutonium Facility Complex at TA-55; (4) construct and operate a new Radioactive Liquid Waste Treatment Facility in TA-50 and operate a zero liquid discharge facility in TA-52 as an auxiliary action; (5) install additional processors and equipment to further expand the capabilities and operation level of the Nicholas C. Metropolis Center for Modeling and Simulation in TA-3; and (6) construct and operate a new Science and Engineering Complex at TA-62. These projects and the changes in operations associated with them are needed to support DOE and NNSA missions; to maintain and improve the safety and security of existing capabilities at LANL; and to further LANL intra-site facility consolidation. Decisions that NNSA is announcing in this ROD will not change the plutonium pit production throughput capability at LANL (20 plutonium pits per year), nor will they influence or be impacted by future decisions that may be made based on the upcoming Nuclear Posture Review. n1

n1 The Nuclear Posture Review is a congressionally mandated comprehensive review of U.S. nuclear deterrence policy and strategy that the Secretary of Defense will conduct in consultation with the Secretary of Energy and the Secretary of State. The requirement for this review can be found in the National Defense Appropriations Act for 2008, Public Law 110-181.

Text

SUPPLEMENTARY INFORMATION: NNSA prepared this ROD pursuant to the regulations of the Council on Environmental Quality (CEQ) for implementing NEPA (40 CFR parts 1500-1508) and DOE's NEPA Implementing Procedures (10 CFR part 1021). Decisions presented in this second ROD are based on information and analysis contained in the SWEIS (including a classified appendix that assesses the potential environmental impacts of a representative set of credible intentional destructive acts that include terrorism scenarios) (73 FR 28453, May 16, 2008), comments received on the Final SWEIS; NNSA's two December 19, 2008, RODs resulting from information and analysis contained in the Complex Transformation SPEIS (73 FR 77644, 73 FR 77656); and other factors, including costs, technical and security considerations, and the missions of NNSA.

LANL is a multidisciplinary, multipurpose research institution in north-central New Mexico, about 60 miles (97 kilometers) north-northeast of Albuquerque, and about 25 miles (40 kilometers) northwest of Santa Fe. LANL occupies about 25,600 acres (10,360 hectares), or approximately 40 square miles (104 square kilometers). About 2,000 structures with approximately 8.6 million square feet under roof serve to house LANL operations and activities, with about half the square footage used as laboratory or production space, and the remaining half used for administrative, storage, service, and other purposes.

LANL is one of three national security laboratories within NNSA's Nuclear Security Enterprise. The main role of LANL in the fulfillment of NNSA and DOE missions is scientific and technological work that supports nuclear materials handling and processing, and weapons component fabrication; stockpile management; materials and manufacturing technologies; nonproliferation programs; and waste management activities. LANL plays a key role in providing stewardship for the nation's nuclear stockpile that includes manufacturing some nuclear weapons components, such as plutonium pits. In addition to weapons component manufacturing, LANL performs weapons component testing, stockpile assurance, component replacement, surveillance, and maintenance. Research and development activities at LANL include high explosives processing, chemical research, nuclear physics research, materials science research, systems analysis and engineering, human genome mapping, biotechnology applications, and remote sensing technologies. Work at LANL is also conducted for other Federal agencies such as the Departments of Defense and Homeland Security, as well as for universities, institutions, and private entities.

The alternatives evaluated in the SWEIS span a range of potential operations from minimum levels that would maintain essential mission support capabilities (Reduced Operations Alternative), through the highest reasonably foreseeable levels that could be supported by current facilities or new facilities (Expanded Operations Alternative). The No Action Alternative analyzed in the SWEIS is essentially a continuation of current operations based on previous NEPA analyses and decisions, including the 1999 LANL SWEIS (DOE/EIS-0238, January 1999) and its ROD (64 FR 50797, September 20, 1999). The Reduced Operations and Expanded Operations Alternatives analyzed in the SWEIS are reductions or expansions of the level of operations for the No Action Alternative. As a matter of convenience, actions associated with implementing the March 2005 LANL Compliance Order on Consent (Consent Order) with the State of New Mexico n2 are only analyzed in the Expanded Operations Alternative. However, NNSA stated in the SWEIS that DOE intends to implement actions necessary to comply with the Consent Order, regardless of decisions it makes on other actions analyzed in the LANL SWEIS.

n2 The March 2005 LANL Compliance Order on Consent was issued pursuant to the New Mexico Hazardous Waste Act and entered into by the State of New Mexico, the Department of Energy and its Management and Operating Contractor to address requirements concerning certain groundwater contaminants toxic pollutants and explosive compounds. The Consent Order may be viewed at *http://www.lanl.gov/environment/compliance/consent_order.shtml.*

The 2008 SWEIS ROD announced NNSA's decision to continue to implement the No Action Alternative with certain elements of the Expanded Operations Alternative. These specific elements were: (1) Continuing to implement actions necessary to comply with the Consent Order, which requires investigation and remediation of environmental contamination at LANL;

(2) broadening the types and quantities of radioactive sealed sources for isotopes of Cobalt, Iridium, Californium and Radium, (Co-60, Ir-192, Cf-252, Ra-226), that LANL will manage and store prior to disposal; (3) expanding the capabilities and operational level of the Nicholas C. Metropolis Center for Modeling and Simulation to support the Roadrunner super computing platform; (4) performing research regarding beryllium detection and mitigation measures; (5) retrieving and disposing of about 3,100 cubic yards of contact-handled and 130 cubic yards of remote-handled legacy transuranic (TRU) waste from below-ground storage; (6) planning, design, construction, and operation of the Waste Management Facilities Transition projects to facilitate actions required by the Consent Order; (7) repairing and replacing mission critical cooling system components for buildings in Technical Area-55 (TA-55); and (8) completing final design of a new Radioactive Liquid Waste Treatment Facility, and designing and constructing the zero liquid discharge facility auxiliary component of the new treatment facility.

NNSA has previously announced its determination that the Expanded Operations Alternative is both its Preferred Alternative and the Environmentally Preferred Alternative. Considering the many aspects of the alternatives analyzed in the SWEIS, and looking out over the long term, NNSA believes that the implementation of changes analyzed in the Expanded Operations Alternative would allow it to best achieve both its mission and environmental responsibilities. Under this alternative, NNSA would be better positioned to minimize the use of electricity and water; streamline operations through consolidation; replace older laboratory and production facilities with new buildings that incorporate modern safety, security, and energy efficiency standards improving NNSA's ability to protect human health; reduce the "footprint" of LANL as a whole; and allow some areas to return to a natural state.

NNSA published as Volume 3 of the SWEIS all comments received on the **[33234]** Draft SWEIS together with NNSA's responses, and discussions of how comments resulted in changes to the document. The 2008 SWEIS ROD included a detailed discussion of the comments received on the Final SWEIS, and will not be repeated here. In response to the concern raised by several of the commenters that proceeding with an increase in plutonium pit production at this time would be premature, NNSA agrees that making decisions at this time on future plutonium pit production levels is premature, and will delay making any decisions in this area until after the completion of the upcoming Nuclear Posture Review. Decisions that NNSA is announcing in this ROD will not change the 20 plutonium pits per year level of plutonium pit production throughput capability established in the 1999 LANL SWEIS ROD.

On December 19, 2008, NNSA issued two RODs based in part on the Complex Transformation SPEIS for the continued transformation of the nuclear weapons complex. One ROD addressed the implementation of programmatic alternatives involving plutonium, uranium, and the assembly and disassembly of nuclear weapons (73 FR 77644). The other announced the implementation of project-specific alternatives involving tritium research and development, flight test operations, and major environmental test facilities (73 FR 77656). NNSA's programmatic decision to retain and consolidate plutonium pit manufacturing and research and development work at LANL means that special nuclear materials and work performed with plutonium will be consolidated from some of the other NNSA sites to LANL. This decision supports the transformation of the nuclear weapons complex into a smaller, more efficient nuclear security enterprise that can respond to changing national security challenges and ensure the long-term safety, security, and reliability of the nuclear weapons stockpile. Two of NNSA's project-specific decisions also directly affect LANL operations: (1) The consolidation of tritium research and operations at the Savannah River Site, which reduces tritium operations at LANL; and (2) the consolidation of major environmental test facilities at Sandia National Laboratories/New Mexico, which closes four facilities at LANL.

Basis for Decision

In this second ROD, NNSA is announcing its decision to continue to implement the No Action Alternative with the addition of elements from the Expanded Operations Alternative of the SWEIS. NNSA has also decided that it will now implement additional elements from the Expanded Operations Alternative that complement the actions taken under the 2008 SWEIS ROD. These additional elements collectively include increases in the operation of some existing facilities and the implementation of a limited number of additional new facility projects needed to support ongoing stockpile stewardship and environmental closure and remediation programs; to enhance nuclear safety and security; and to provide modern features for the protection of workers and the environment. NNSA will continue to undertake intra-site consolidation of operations and activities to reduce the physical "footprint" of LANL and improve efficiency and address the LANL Land Transfer requirements of Public Law 105-119. NNSA also will continue to coordinate with the DOE's Office of Environmental Management to execute environmental closure and remediation actions including major material disposal area (MDA) remediation, canyon cleanups and all activities necessary to meet Consent Order requirements, the LANL Federal Facility Compliance Agreement, and DOE commitments regarding the use of resources provided through the American Recovery and Reinvestment Act of 2009 (ARRA) (Pub. L. 111-5).

Environmental Impacts Associated With Decisions

In making the decisions announced in this ROD, NNSA considered the potential impacts for normal operations (those operations without accidents or intentional destructive acts) as well as impacts analyzed in the SWEIS from potential accidents and intentional destructive acts, including credible terrorism scenarios, on workers and surrounding populations, as it did in developing the 2008 ROD. NNSA also evaluated the potential impacts associated with the irreversible or irretrievable commitments of resources, and the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. These analyses and results are described in the Summary and Chapters 4 and 5 of the SWEIS. Additional project specific analyses are included in the Appendices to the SWEIS.

Decisions

Operations at LANL provide a wide range of scientific and technological capabilities for NNSA's National Nuclear Security Enterprise (Nuclear Weapons Complex). NNSA's decisions are based on its current and anticipated mission responsibilities and its need to continue to operate LANL in a manner that allows NNSA to efficiently and effectively fulfill its mission responsibilities in an environmentally protective and fiscally prudent manner. The need for the decisions identified in this ROD exists regardless of any future decisions that may be made about the level of plutonium pit production at LANL. National security policies and related laws require NNSA to maintain the Nation's nuclear weapons stockpile, as well as its core competencies in nuclear weapons. The nuclear facilities at LANL are essential to NNSA's ability to execute this core program and to support NNSA's aggressive and far-reaching nuclear non-proliferation efforts. The changes in operations and new projects announced in this ROD are needed to fulfill NNSA and DOE mission responsibilities and meet various requirements that have arisen since 1999, and are consistent with recent decisions regarding the nuclear weapons complex transformation.

Consistent with the decisions announced in the first ROD under the SWEIS, NNSA and DOE's Office of Environmental Management will continue to implement actions required by the March 2005 Consent Order along with other activities needed for environmental cleanup at LANL:

(1) Analytical chemistry sample processing, waste management activities such as waste characterization operations and waste processing, storage and transportation actions, as well as waste disposal at appropriate waste disposal facilities located both on-site and off-site; (2) the clearing of site vegetation; (3) decontamination, decommissioning and demolition (DD&D) of structures and buildings with priority to those that must be removed to reach buried contamination; (4) exhumation of buried contamination; (5) exhumation and transportation of soil and rock from on-site borrow pits; (6) construction of roads to reach sites with heavy equipment, lay-down areas for equipment and materials and waste storage and staging, and parking sites to meet the needs of vehicles involved in transporting wastes, equipment and materials; and (7) delineation and fencing of clean-up sites.

Environmental cleanup projects that will be undertaken and completed under this ROD include:

- Completing the remediation and closure of TA-18 Pajarito Site. This would include relocating remaining operations to existing facilities within LANL, performing the DD&D of existing **[33235]** site structures and completing remediation of the TA-18 canyon-bottom site.

- Completing the remediation and closure of TA-21 Delta Prime (DP) Site with an emphasis on DD&D and environmental remediation of MDAs. This would include the DD&D of the TA-21 buildings. Those structures that cover or could interfere with activities to investigate and remediate MDAs and other potential release sites under the Consent Order would be given priority. Both DP West and DP East facilities will undergo DD&D and thorough characterization, decontamination, and demolition, with waste disposal dependent on facility characterization information. The underlying waste sites can then be properly investigated, considered for corrective actions that may be required under the Consent Order and remediated as appropriate.

The NNSA has also decided to implement the additional projects specified in this ROD that involve the design, construction and operation of new replacement buildings, and the renovation of certain existing facilities. This decision includes the implementation of all associated actions needed to facilitate construction or renovation projects, including those related to the transfer of operations, and those necessary for the DD&D of spaces vacated by moving existing facilities. These projects are part of the vision that NNSA has established for the future Nuclear Security Enterprise.

NNSA's vision for the future remains a smaller, safer, more secure and less expensive enterprise that leverages the scientific and technical capabilities of its workforce to meet all our national security requirements. The specific projects that NNSA has decided to implement are:

- Refurbish the Plutonium Facility Complex (PF-4) at TA-55: This refurbishment project consists of seven subprojects that either replace or upgrade obsolete and/or worn-out facility components/safety systems or address regulatory-driven requirements at the PF-4 building in TA-55. Replacement and maintenance of critical infrastructure and safety systems is necessary to ensure the reliability of this facility and compliance with safety and regulatory requirements.
- Construct and operate a new Radioactive Liquid Waste Treatment Facility, (RLWTF), at TA-50 together with the operation of a zero liquid discharge facility at TA-52 as an auxiliary action: These actions replace/restore an existing capability at LANL for processing radioactive liquid wastes. The existing RLWTF at TA-50 is the only facility available at LANL to treat a broad range of transuranic and low-level radioactive liquid wastes. It is an aging facility (over 40 years old) that has exceeded its design life.
- Install additional processors and equipment as necessary to further expand the capabilities and operation level of the Nicholas C. Metropolis Center for Modeling and Simulation at TA-3: These actions will be undertaken to support future operations up to the level of operations analyzed in the SWEIS as attainable through the consumption of a maximum electric power use of 15 megawatts, and a maximum potable water use of 51 million gallons per year. Calculations performed at the Nicholas C. Metropolis Center support the continued certification of the nuclear weapons stockpile without conducting underground nuclear tests, and also support research on global energy challenges and other scientific issues.
- Construct and operate a new Science and Engineering Complex at TA-62 (analyzed as the Science Complex Option 1 in Appendix G of the SWEIS): This action consolidates offices and light laboratories currently located in several outmoded structures at LANL into a new, state-of-the-art facility of approximately 400,000 gsf. It would support scientific research activities in both basic and applied sciences. Execution of this project would be accompanied by DD&D of excess structures at LANL.

The NNSA will implement changes to operational levels at existing facilities and install new infrastructure analyzed as part of the Expanded Operations Alternative that support decisions announced in this ROD, the 2008 SWEIS ROD and the two SPEIS RODs. The changes to on-going operational levels at existing facilities (and their replacement facilities) include: (1) Changes and increases to the capabilities for waste storage, characterization, packaging, and labeling at solid and liquid radioactive waste and chemical waste management and treatment facilities to support the processing and disposition of transuranic, low-level and mixed low-level radioactive waste, and chemical waste from site DD&D activities; and (2) the performance of site assessments, soil remediation, and the enhancement of field capabilities to support of environmental remediation and risk mitigation at LANL.

Mitigation Measures

As described in the SWEIS, NNSA and LANL operate pursuant to a number of Federal laws including environmental laws, DOE Orders, and Federal, State, and local controls, and agreements. Many of these mandate actions that serve to mitigate potential adverse environmental impacts. A Los Alamos Mitigation Action Plan (MAP) for the SWEIS RODs has been issued and will be reviewed and updated as necessary to implement this ROD. As discussed in the 2008 ROD, this MAP contains a summary of all commitments for LANL that are either underway or will be initiated. These commitments include such actions as continued forest management efforts, trail management efforts, and implementation of a variety of site sampling and monitoring measures, as well as additional measures to reduce potable water use and pollutant emissions and implement resource conservation initiatives.

In addition, with respect to concerns raised by the Santa Clara Pueblo, as discussed in the 2008 ROD, NNSA will continue its efforts to support the Pueblo and other tribal entities in matters of human health and will participate in various intergovernmental efforts to protect indigenous practices and locations of concern. NNSA will conduct government-to-government consultations with the Pueblo and other tribal entities to incorporate these matters into the MAP.

Issued at Washington, DC, this 29 day of June 2009.

Thomas P. D'Agostino,

Administrator, National Nuclear Security Administration.

[FR Doc. E9-16343 Filed 7-9-09; 8:45 am]

BILLING CODE 6450-01-P

Contacts

FOR FURTHER INFORMATION CONTACT: For copies of the SWEIS, the 2008 SWEIS ROD or this ROD, or to receive further information about other issues regarding the Los Alamos Site Office's National Environmental Policy Act (NEPA) compliance program, contact: Mr. George J. Rael, Assistant Manager Environmental Operations, NEPA Compliance Officer, U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Site Office, 3747 West Jemez Road, Los Alamos, NM **[33233]** 87544. Mr. Rael may be contacted by telephone at (505) 665-5658, or by e-mail at LASO.SWEIS@doeal.gov. For information on the DOE NEPA process, contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-20), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-4600, or leave a message at (800) 472-2756. Additional information regarding DOE NEPA activities and access to many DOE NEPA documents, including those referenced in this ROD, are available on the Internet through the DOE NEPA Web site at *http://www.gc.energy.gov/nepa/*.

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NPDES PERMIT NO. NM0028355
FACT SHEET

EXHIBIT
NN

FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

APPLICANT

Los Alamos National Security, LLC	AND	U.S. Department of Energy
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DATE PREPARED

June 26, 2013

PERMIT ACTION

Proposed reissuance of the expired permit issued with an effective date of August 1, 2007, and an expiration date of July 31, 2012. The permit was re-applied for timely and was therefore subsequently administratively continued.

RECEIVING WATER – BASIN

Rio Grande (see details below) – Segment No. 20.6.4.126/128 of the Rio Grande Basin

DOCUMENT ABBREVIATIONS

In the document that follows, various abbreviations are used. They are as follows:

4Q3	Lowest four-day average flow rate expected to occur once every three-years
BAT	Best available technology economically achievable
BCT	Best conventional pollutant control technology
BPT	Best practicable control technology currently available
BMP	Best management plan
BOD	Biochemical oxygen demand (five-day unless noted otherwise)
BPJ	Best professional judgment
CBOD	Carbonaceous biochemical oxygen demand (five-day unless noted otherwise)
CD	Critical dilution
CFR	Code of Federal Regulations
cfs	Cubic feet per second
COD	Chemical oxygen demand
COE	United States Corp of Engineers
CWA	Clean Water Act
DMR	Discharge monitoring report
ELG	Effluent limitation guidelines
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FCB	Fecal coliform bacteria
F&WS	United States Fish and Wildlife Service
mg/l	Milligrams per liter (one part per million)
ug/l	Micrograms per litter (one part per billion)
MGD	Million gallons per day
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMIP	New Mexico NPDES Permit Implementation Procedures
NMWQS	New Mexico State Standards for Interstate and Intrastate Surface Waters
NPDES	National Pollutant Discharge Elimination System
MQL	Minimum quantification level
O&G	Oil and grease
POTW	Publically owned treatment works
RP	Reasonable potential
SIC	Standard industrial classification
s.u.	Standard units (for parameter pH)
SWQB	Surface Water Quality Bureau
TDS	Total dissolved solids
TMDL	Total maximum daily load
TRC	Total residual chlorine
TSS	Total suspended solids
UAA	Use attainability analysis
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Service
WLA	Wasteload allocation
WET	Whole effluent toxicity
WQCC	New Mexico Water Quality Control Commission

WQMP Water Quality Management Plan
WWTP Wastewater treatment plant

STATE CERTIFICATION: The permit is in the process of certification by the State agency following regulations promulgated at 40 CFR124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service; and to the National Marine Fisheries Service prior to the publication of that notice.

TRIBAL CERTIFICATION: Several Pueblos are located in the vicinity of Los Alamos National Laboratory. They include the following: San Ildefonso, Santa Clara, and Cochiti. The Santa Clara Pueblo has approved water quality standards (WQS); however, it is not adjacent to any stream where discharges are proposed to be authorized. Santa Clara is therefore not believed to be affected by the discharges proposed to be authorized by this permit. Neither San Ildefonso nor Cochiti Pueblo has submitted WQS for approval at this time; therefore, the only 401 certification is required from the State of New Mexico. However, pursuant to EPA's Tribal Consultation Policy, EPA offered, in letters of January 10, 2013, to San Ildefonso and Cochiti Pueblos, respectively, the opportunity to engage in government-to-government consultation because they are located downstream of the facility's discharges.

ENDANGERED SPECIES ACT: In accordance with requirements under section 7(a)(2) of the Endangered Species Act, EPA has reviewed this permit for its effect on listed threatened and endangered species and designated critical habitat. According to the most recent county listing of species, for the State of New Mexico revised as of 2012, the following species are listed in the county where the proposed NPDES discharge occurs: black-footed ferret (*Mustela nigripes*), southwestern willow flycatcher (*Empidonax traillii extimus*), and Mexican spotted owl (*Strix occidentalis lucida*). Bald eagle (*Haliaeetus leucocephalus*) is delisted since prior issuance of the permit in 2007. No other changes have been made to the US Fish and Wildlife list of threatened and endangered species and critical habitat designation in the area of the discharge since prior issuance of the permit.

During the re-issuance of this permit in 2000, EPA conducted informal consultation with the US Fish and Wildlife Service (the FWS or the Service) (Cons. #2-22-01-I-018). That consultation was concluded on December 7, 2000 with the Service concurring by letter with EPA's determination that the re-issuance of the NPDES permit for LANL would have "no effect" on Mexican spotted owl and "may affect, not likely to adversely affect" on the bald eagle and southwestern willow flycatcher. The FWS also found that black-footed ferret was not present in the permit action area.

The FWS concluded in the 2000 consultation letter: "Based on information in the BE (Biological Evaluation), the Service believes that the reissued permit should slightly improve effluent water quality at LANL over the 5-year permit. In addition, re-issuance of the NPDES permit will not measurably alter stream morphology, flow patterns, temperatures, water chemistry, or slit loads in any of the affected intermittent tributaries or the Rio Grande. Therefore, the Service concurs with the EPA determination that the re-issuance of the NPDES permit for LANL will have "no effect" on the Mexican spotted owl, and "may affect, not likely to adversely affect" the bald eagle and southwestern willow flycatcher."

EPA determined, when re-issuing the permit in 2007, that the re-issuance of Permit No. NM0028355 would not alter the environmental baseline; therefore, the 2007 action had "no effect" upon the previous consultation baseline on listed threatened and endangered species and it would not adversely modify designated critical habitat. EPA believes that the conclusion statements made by the FWS in 2000 and EPA's determination made in 2007 are still true for this NPDES permit renewal action. There are changes of permit conditions and those changes are either because of the cessations of discharges or because of no reasonable potential of existing discharges to cause exceedances of WQS. Information available does not indicate increases of total discharge loads or additions of new pollutants which may cause adverse environmental impacts. EPA determines that this action results in no significant change to the environmental baseline (except for the removal of bald eagle from the federal endangered species list and reduction of discharge outfalls) established by the consultation conducted during previous issuance of the permit; therefore, EPA concludes that this re-issuance of the permit will not cause change to EPA's previous determination as well as the FWS's conclusions made during the 2000 consultation. EPA determines that this permitting action has "no effect" on the 2000 consultation baseline for willow flycatcher.

FINAL DETERMINATION: The public notice describes the procedures for the formulation of final determinations.

I. CHANGES FROM THE PREVIOUS PERMIT

Significant changes from the permit previously issued June 8, 2007, with an effective date of August 1, 2007, and an expiration date of July 31, 2012, are:

A. Eliminate six Outfalls 02A129, 03A021, 03A028, 03A130, 03A158, and 03A185;
B. Delete Water Quality-based effluent limitations (WQBEL) for aluminum at Outfall 001;
C. Establish WQBEL for copper and zinc based on 50 mg/l of hardness and set hardness limitation of >= 50 mg/l at Outfall 051;
D. Delete WQBEL and total phosphorus limit at Outfall 03A022;
E. Delete all WQBEL, except for TRC, at Outfalls 03A027, 03A113, 03A181, and 03A199;
F. Establish WQBEL for arsenic and selenium at Outfall 03A048;
G. Add WQBEL for arsenic and cyanide at Outfall 03A160;
H. Add WQBEL for selenium and cyanide at Outfall 03A199;
I. Establish new critical dilutions at Outfalls 03A027 and 03A199;
J. Delete Whole Effluent Toxicity (WET) testing requirements for Outfalls 03A048, 03A113, 03A160, and 03A181;
K. Establish WET limit at Outfall 051; and
L. Change sampling location of Outfall 13S.

II. APPLICANT LOCATION AND ACTIVITY

Under the Standard Industrial Classification (SIC) Codes 9922, 9711, 9661, and 9611, the applicant currently operates a large multi-disciplinary facility which conducts national defense research and development, scientific research, space research and technology development, and energy development.

As described in the application, the plant site is located in Los Alamos County, New Mexico. The discharges are to receiving waters consisting of various tributaries in Waterbody Segment Code No. 20.6.4.126 and 20.6.4.128 of the Rio Grande Basin. Those discharges are:

Tech. Area	Outfall Number	Receiving Stream
3-22	001	Sandia Canyon
3-66	03A022	Mortandad Canyon
3-2327	03A027	Sandia Canyon
53-963, -964 -978, -979	03A048	Los Alamos Canyon
53-293, -952, -1032, SW	03A113	Sandia Canyon
35-124, -595	03A160	Ten Site Canyon
55-6	03A181	Mortandad Canyon
3-1837	03A199	Tributary to Sandia Canyon
16-1508	05A055	Canon de Valle
50-1	051	Mortandad Canyon
46-347	13S	Canada del Buey

There have been no discharges at Outfall 05A055 since November 2007 and at Outfall 051 since November 2010. The facility plans to eliminate four more outfalls (i.e., Outfalls 03A027, 03A160, 03A181, and 03A199) over the next 2 to 5 years.

Outfall Type	Category (detailed descriptions of sources of discharges are provided in the application)
001	Power plant discharge and re-used treated sanitary wastewater
03A	Cooling tower blowdown, evaporative coolers, chillers, condensers, and air washer blowdown
05A	High explosive waste water discharge
051	Industrial and radioactive wastewater treatment plant
13S	Sanitary wastewater

III. EFFLUENT CHARACTERISTICS

A quantitative description of each discharge is presented in the EPA Permit Application Form 2C dated January 27, 2012. The maximum monthly flow and pollutants which were detected and reported above EPA defined minimum quantification levels (MQLs) at each outfall are used for the reasonable potential (RP) analysis.

IV. REGULATORY AUTHORITY/PERMIT ACTION

In November 1972, Congress passed the Federal Water Pollution Control Act establishing the NPDES permit program to control water pollution. These amendments established technology-based or end-of-pipe control mechanisms and an interim goal to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water," more commonly known as the "swimmable, fishable" goal. Further amendments in 1977 of the CWA gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry and established the basic structure for regulating pollutants discharges into the waters of the United States. In addition, it made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. Regulations governing the EPA administered NPDES permit program are generally found at 40 CFR §122 (program requirements & permit conditions), §124 (procedures for decision making), §125 (technology-based standards) and §136 (analytical procedures). Other parts of 40 CFR provide guidance for specific activities and may be used in this document as required.

It is proposed that this permit be reissued for a 5-year term following regulations promulgated at 40 CFR §122.46(a).

V. DRAFT PERMIT RATIONALE AND PROPOSED PERMIT CONDITIONS

A. OVERVIEW OF TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Regulations contained in 40 CFR §122.44 requires that NPDES permit limits are developed that meet the more stringent of either technology-based effluent limitation guidelines, numerical and/or narrative water quality standard-based effluent limits, or the previous permit.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

Regulations promulgated at 40 CFR §122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on ELGs where applicable, on BPJ in the absence of guidelines, or on a combination of the two. In the absence of promulgated guidelines for the discharge, permit conditions may be established using BPJ procedures. EPA establishes limitations based on the following technology-based controls: BPT, BCT, and BAT. These levels of treatment are:

BPT - The first level of technology-based standards generally based on the average of the best existing performance facilities within an industrial category or subcategory.

BCT - Technology-based standard for the discharge from existing industrial point sources of conventional pollutants which may include BOD, TSS, pH, and O&G.

BAT - The most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. BAT effluent limits represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Following are the summary of the BPJ-based limitations included in the administratively continued permit and EPA proposes to retain them in the permit:

<u>Outfall 001</u> (Power Plant Effluent and re-used Treated Sanitary Wastewater) - Based on ELG for low volume waste discharge at electric steam power plants in 40 CFR 423.

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l

<u>Outfall Type 03A</u> (Treated Cooling Water) - Based on ELG for low volume waste discharge at electric steam power plants in 40 CFR 423.

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Total Phosphorus	20 mg/l	40 mg/l
pH	Range from 6.0 to 9.0 standard units	

(More stringent WQ-based pH applies to direct discharge outfalls if applicable)

<u>Outfall 05A055</u> (High Explosives Waste Water) – Total toxic organics (TTO) were based on ELG for metal finishing (40 CFR 433.11), TNT was based on permit limit established for the Pantex plant, and RDX was based on LANL effluent data. All these BPJ-based limitations were established in 2000 issued permit.

	Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Oil & Grease	15 mg/l	15 mg/l
Total Toxic Organics	1.0 mg/l	1.0 mg/l
Trinitrotoluene	20 µg/l	Report
Total RDX	200 µg/l	660 µg/l
Perchlorate	Report	Report
pH	Range from 6.0 to 9.0 standard units	

Outfall 051 (Radioactive and Industrial Waste Water) – TTO was based on 40 CFR 433.11.

	Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Total Toxic Organics	1.0 mg/l	1.0 mg/l
Total Chromium	1.34 mg/l	2.68 mg/l
Total Lead	0.423 mg/l	0.524 mg/l
Perchlorate	Report	Report
pH	Range from 6.0 to 9.0 standard units	

Outfall 13S (Sanitary Waste Water) – Based on the ELG for secondary treatment in 40 CFR 133.

	Monthly Average	Daily Maximum
Biochemical Oxygen Demand	30 mg/l	45 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
pH	Range from 6.0 to 9.0 standard units	

The administratively continued permit contains mass limits at Outfalls 13S based on a long term average flow of 0.298 MGD and a projected flow of 0.318 MGD to cover increased flow due to a residential subdivision sewer line tie-in project. Because the sewer line tie-in project was cancelled, the mass load limitations are recalculated based on the new long term average flow of 0.29 MGD. The new monthly average and daily maximum loadings are 73 and 109 lb/day, respectively.

The permittee requested to change the sampling location from a point after the chlorine contact chamber to the flow measuring device in Canada del Buey because treated water will be conveyed to a sanitary reclamation recycling facility (SERF) and therefore no discharge occurs unless discharge is made directly to Canada del Buey. EPA determines that monitoring and sampling are not required for wastewater to be further treated and reused for other process, so proposes to change the sampling location to the flow measuring device in Canada del Buey in case discharge is made to Canada del Buey.

C. WATER QUALITY BASED LIMITATIONS

1. General Comments

Water quality based requirements are necessary where effluent limits more stringent than technology-based limits are necessary to maintain or achieve federal or state water quality limits. Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on federal or state WQS. Effluent limitations and/or conditions established in the draft permit are in compliance with applicable State WQS and applicable State water quality management plans to assure that surface WQS of the receiving waters are protected and maintained, or attained.

2. Implementation

The NPDES permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the NPDES permits. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

3. State Water Quality Standards

The general and specific stream standards are provided in NMWQS (20.6.4 NMAC amended through November 20, 2012). EPA approved three hardness-dependent metal criteria, aluminum, cadmium, and zinc on April 30, 2012. Therefore, new criteria were used for RP screening. The facility discharges into varied canyons in Segment No. 20.6.4.126 or 20.6.4.128 of the Rio Grande Basin. The designated uses of the receiving water are described below:

20.6.4.126 Rio Grande Basin - Perennial portion of ... Sandia canyon from Sigma canyon upstream to LANL NPDES outfall 001, ...

(A) Designated Uses: coldwater aquatic life, livestock watering, wildlife habitat and secondary contact.

20.6.4.128 Rio Grande Basin - Ephemeral and intermitten portions of watercourses within lands managed by U.S. department of energy (DOE) within LANL, including but not limited to: Mortandad canyon, Canada del Buey, Ancho canyon, Chaquehui canyon, Indio canyon, Fence canyon, Potrillo canyon and portions of Canon de Valle, Los Alamos canyon, Sandia canyon, Pajarito canyon and Water canyon not specifically identified in 20.6.4.126 NMAC.

(A) Designated Uses: livestock watering, wildlife habitat, limited aquatic life and secondary contact.

Water quality standards of chronic aquatic life and non-persistent human health do not apply to segment number 20.6.4.128.

As described earlier in this Fact Sheet, Los Alamos National Laboratory discharges to Sandia Canyon, Los Alamos Canyon, Mortandad Canyon, Canon de Valle, and Ten Site Canyon. The facility's discharges, most of which are intermittent in nature, are located from 6.9 to 10.4 miles from the Rio Grande. All of the receiving streams are ephemeral or intermittent in nature and do not generally reach the Rio Grande, except as the result of precipitation events. The State standards for livestock watering, wildlife habitat, acute aquatic life and general WQS apply to the proposed discharges. Chronic aquatic life criteria could be applied at Outfall 001 because the effluent creates a perennial portion within Sandia Canyon which is designated also for cold aquatic life use. Discharges from Outfalls 03A027 and 03A199 which are located at downstream from Outfall 001 will reach the perennial portion of Sandia Canyon, so chronic aquatic life standards also apply. For discharges into receiving streams in segment number 20.6.4.128 which are either ephemeral or intermittent in nature, no in-stream dilution is used to calculate either the in-stream waste concentrations (IWCs) or the proposed limits. All WQ-based limits in the segment number 20.6.4.128 were calculated based on 100% effluent. For discharges at Outfalls 03A027 and 03A199, the long-term average effluent flow at Outfall 001 was used to calculate critical dilution for discharges from Outfalls 03A027 and 03A199 against chronic criteria because Outfall 001 effluent is the upstream flow of these two outfalls. However, because the discharge at Outfall 03A199 is to a stormwater drain prior to reaching Sandia Canyon, an additional RP was conducted against WQS for 20.6.4.128 waterbody. A statistical multiplier of 2.13, pursuant to NM Implementation Guidance, was applied to effluent data and the data were screened against water quality standards to determine whether the discharge has a reasonable potential (RP) to exceed the applicable water quality standards. Each effluent hardness value (except for Outfalls 03A027 and 03A199 at Sandia Canyon) was used to calculate the hardness-dependent standards. The hardness and TSS values of Outfall 001 effluent were used to calculate the RP for discharges at Outfalls 03A027 and 03A199. Because cooling tower blowdown has not been discharged at Outfall 03A022 since November 2011 and the effluent analytical results reported in the Form 2C were based on a sample taken when blowdown still discharged at that outfall, EPA decided not to conduct a RP screening for Outfall 03A022 based on effluent data no longer representative of the actual discharge from this outfall. Copper and TRC were the only two WQBEL established for Outfall 03A022 in the administratively continued permit. Because copper concentrations were reported below both effluent limitations and MQL for copper, and chlorine would not likely be used for storm runoffs, EPA is not requiring storm runoff data to conduct RP for this permit term. The Table below lists stream low flows, hardness and TSS values used for RP analysis.

Outfall Number	Effluent Flow (MGD)	Hardness (mg/l)	TSS (mg/l)	4Q3 Low Flow (cfs)
001	0.357	78.8	1.08	0.0
13S	0.29	102	2.17	0.0
03A027	0.102	78.8	1.08	0.55
03A048	0.104	179	1.0	0.0
03A113	0.09	167	1.8	0.0
03A160	0.002	118	1.0	0.0
03A181	0.0094	84.7	1.0	0.0
03A199 at the point of discharge	0.0395	122	4.3	0.0
03A199 at the point reaches Sandia Canyon	0.0395	78.8	1.08	0.55

4. Effluent Limitations

Effluent data from each outfall reported in Form 2C were screened against the current EPA approved NM WQS. Spread sheets used to calculate the reasonable potential can be found in the Appendix to this Fact Sheet. The initial screening results show that the following discharges have RP to exceed the WQS for the designated uses in 20.6.4.128:

Outfall No.	Parameters
03A048	Arsenic and Selenium
03A160	Arsenic, Copper and Cyanide
03A199	Selenium and Cyanide

Total Residual Chlorine (TRC) - Although only one outfall (Outfall 03A048) has reported TRC at detectable amounts, effluent limitations and monitoring requirements for TRC at administratively continued permit are retained because discharges would have potentials to exceed water quality standards for TRC when chlorine products are used for disinfection or algae control. However, because the effluent limitations and monitoring requirements for TRC are based on the permit writer's discretionary rather than RP, EPA determines to retain the existing monitoring frequency of 1/week, rather than the monitoring frequency recommended in the NMIP, at all applicable outfalls. In accordance with the NMIP, the permit writer may establish a case-by-case monitoring frequency based on the following factors: (1) the type of treatment process, including retention time; (2) environmental significance and nature of the pollutant or pollutant parameter; (3) cost of monitoring relative to the discharger's capabilities and benefit obtained; (4) Compliance history; (5) number of monthly samples used in developing the permit limit; and (6) effluent variability. The TRC applies to Outfall 13S only when discharge is made directly to Canada del Buey through the alternate discharge point.

E. coli - Monitoring requirements and effluent limitations apply at Outfalls 001, 13S, or 03A027 where final treated sanitary wastewater actually discharges. The monitoring frequency is 2/month based on the frequency recommended in the NMIP for a municipal facility with activated sludge technology and a design flow of $0.1 \leq 0.5$ MGD.

Outfall 001 - EPA approved new standards for hardness-dependent total aluminum on April 30, 2012, and the discharge has demonstrated no RP to exceed new standards. Therefore, the effluent limitations and monitoring requirements for aluminum in the administratively continued permit will be deleted from Outfall 001.

Outfall 03A022 - Because cooling tower blowdown has no longer been discharged at Outfall 03A022 but may only discharges emergency use potable cooling water from circulating tank and storm water from roof drain, all existing WQ-based limitations and BPJ-based phosphorus limitations in the administratively continued permit are proposed to be removed. Cooling tower blowdown is not authorized for discharge at this outfall.

Outfall 03A048 - Because the discharge at Outfall 03A048 has RP to cause or contribute to a water quality violation for arsenic and selenium, site-specific effluent limitations are established at the outfall. Limitations for selenium are based on wildlife habitat standards and limitations for arsenic are based on human health standard. EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The permittee may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS. Because discharges at this outfall flow to an ephemeral/intermittent stream which does not support a drinking water use and also is unlikely to provide adequate habitat for fish propagation or growth, discharges to this stream would have limited on human health. EPA, on a case-by-case discretionary, proposes 1/year monitoring frequency for arsenic. However, selenium may affect wildlife downstream the outfall whenever there are discharges, EPA proposes 3/week monitoring frequency when discharge occurs.

Outfall 03A160 - Because the discharge at Outfall 03A160 has RP to cause or contribute to a violation for arsenic, copper, and cyanide, site-specific effluent limitations are established at this outfall. Limitations for copper are based on acute aquatic life standard, for cyanide are based on wildlife habitat standard and for arsenic are based on human health standard. EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The permittee may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS. Because discharges at this outfall flow to an ephemeral/intermittent stream which does not support a drinking water use and also is unlikely to provide adequate habitat for fish propagation or growth, discharges to this stream would have limited on human health. EPA, on a case-by-case discretionary, proposes 1/year monitoring frequency for arsenic. However, copper and cyanide may affect aquatic life or wildlife around the outfall whenever discharges occur. EPA proposes 3/week monitoring frequency for copper and cyanide when discharge occurs.

Outfall 03A199 - Because the discharge at Outfall 03A199 has RP to cause or contribute to a violation for selenium and cyanide, site-specific effluent limitations are established at this outfall. Limitations for selenium and cyanide are based on wildlife habitat standard, and discharges may affect wildlife around the outfall whenever discharges occur. EPA proposes 3/week monitoring frequency for selenium and cyanide when discharge occurs.

Outfalls 03A027, 03A113, and 03A181 - Because discharges at these outfalls demonstrated no RP, WQ-based effluent limitations are not proposed and any WQ-based effluent limitations (except for TRC as described above) in the administratively continued permit are discontinued at these outfalls. Effluent limitations and monitoring requirements for E. coli apply if treated sanitary wastewater discharged at Outfall 03A027 or any other outfalls.

Outfalls 051 - The effluent is evaporated through a mechanical evaporator and has no discharge since November 2010. The facility includes the outfall in the application in case the evaporator becomes unavailable due to maintenance, malfunction, and/or capacity shortage. The facility did not include effluent characteristics in the application. The facility requests to modify the process to adjust the effluent hardness so the discharge has the same hardness value of 50 mg/l as the influent has because the filtration and reverse osmosis treatment systems have caused low hardness in the effluent. LANL stated that low hardness in the effluent makes the discharge fail the WET test and effluent limitations for copper and zinc in the administratively continued permit are unattainable low. Both copper and zinc WQS are hardness-dependent and the copper and zinc limitations in the administratively continued permit were derived based on a near-zero low hardness value. Like pH adjustment, because the adjustment of hardness will make the effluent more suitable for aquatic life habitat, EPA proposes new effluent limitations for hardness-dependent metals based on adjusted effluent hardness. Effluent data showed that TSS concentrations in discharges were below 1 mg/l. Based on the 50 mg/l of hardness and 1 mg/l of TSS, the calculated total copper WQS is 14.3 μg/l and zinc is 191 μg/l. EPA proposes to establish water quality standards as effluent limitations for copper (0.014 mg/l Daily Max and Monthly Avg) and zinc (0.191 mg/l Daily Max and Monthly Avg). EPA also proposes to retain all other monitoring requirements for toxic pollutants in the permit and require LANL to take at least two samples per term from different discharge events for representative effluent characteristic analyses if discharges occur, so EPA may conduct RP screenings based on true effluent data. Because the effluent with a greater hardness will cause less toxicity to aquatic life, a hardness limitation of 50 mg/l or greater is established to ensure the effluent has a hardness value not less than 50 mg/l. Monitoring frequency for copper and zinc are increased from 1/month to 3/week when discharges occur.

Outfall 05A055 – There has been no discharge from the High Explosive Wastewater Treatment Facility (HEWTF) at Outfall 05A055 since November 2007. Normal operations since November 2007 have utilized the electric evaporator and eliminated the discharge. The applicant intends to continue to operate the HEWTF using the evaporator except under abnormal conditions (i.e., malfunction of the evaporator). There was no WQ-based effluent limitation established in the administratively continued permit and no change is proposed for this renewal action.

PCBs – The administratively continued permit has PCB effluent limitations and monitoring requirements at Outfall 001 and at Outfall 13S (if a direct discharge occurred at Outfall 13S), and monitoring and reporting only requirements at Outfall 051. The administratively continued permit restricts re-route, reuse, or discharge of PCB contaminated effluent at other outfalls, except at Outfall 001 or Outfall 13S. In order to avoid hindering any process or technology which could be considered for either PCB clean-up, PCB removal, water reuse or future discharge reduction, EPA determines not to include such restrictions in the proposed permit. If circumstances arise in which PCB contained effluent discharges at different outfalls, the same PCB effluent limitations and monitoring requirements established at Outfall 001 will apply to those outfalls unless the permit is modified to establish a site-specific limitation based on new discharge and/or stream flow data.

Since there have been no discharges at Outfall 13S and Outfall 051, monitoring data are not available for evaluation at those two outfalls. Effluent data from 2008 to 2011 indicated that discharges at Outfall 001 exceeded the interim monthly average limitation of 0.009 μg/l in 2009, and all data exceeded the final limitation (to be effective on July 30, 2012) of 0.000640 μg/l. Information provided by the applicant indicated that PCB analytical results from the October 23, 2012 sample was 0.000565 μg/l.

LANL requested removal of the requirement to use Method 1668A for PCB analysis for enforcement purposes because that method is not an EPA approved method, but LANL is willing to accept Method 1668A only for reporting purpose. The requirements of using Method 1668A and associated MQLs for PCB analysis and 0.00064 µg/l of total PCB limitation to protect human health in the administratively continued permit were based on the condition of State Certification dated March 30, 2006, and a letter addressing the amendment of State Certification dated February 1, 2007, respectively, when EPA reissued the permit in 2007.

EPA proposed Method 1668C when EPA proposed changes to analysis and sampling test procedures in wastewater regulations (i.e., 40 CFR 136), under the title "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures", in the Federal Register Vol. 75, No. 184, September 23, 2010. Method 1668 determines individual chlorinated biphenyl congeners in environmental samples by isotope dilution and internal standard high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). After consideration of all comments received by EPA, EPA in the final rule making decided to defer the final approval of Method 1668C to a later date.

In accordance with the provision of 40 CFR part 144.22(i)(1)(iv), to assure compliance with permit limitations, the permit shall have requirements to monitor effluents according to test procedures approved under 40 CFR part 136 for the analyses of pollutants having approved methods under that part, and according to a test procedure specified in the permit for pollutants with no approved methods. Because EPA deferred the final approval for Method 1668C, Method 1668C or previous versions (PCB congener method) is currently not an EPA approved 40 CFR part 136 method. Rather, Method 608 or 625 (PCB Aroclor method) is the current EPA approved method which can determine PCB quantities by Aroclors (e.g., PCB-1016, PCB-1221, ... PCB-1260).

Method 1668C or the latest congener method is proposed for monitoring purposes only and not for compliance purposes. But, Method 1668C or the latest congener method will be required whenever a congener method is promulgated and then the minimum levels of quantification (MLs) defined in the congener method procedures may be considered equivalent to MQLs for analytical and reporting purposes. The proposed permit allows the permittee to develop discharge-specific MQLs based on the minimum detection level (MDL) and that the MQL = 3.3 x MDL.

The State of New Mexico, Surface Water Quality Bureau (SWQB), stated in a letter dated December 20, 2012, that "the State will condition the permit certification to require the use of Method 1668, most recent revision thereof, with appropriate method specific MQLs, for purpose of PCB monitoring." The basis for the NMED statement was the WQS found in 20.6.4.900(J)(2), which is 0.00064 µg/l, and NMED rendered that the method detection level of 0.2 µg/l was pointless for purposes of monitoring or compliance.

After considerations of EPA regulations, NMED pre-certification letter, and permittee's request, EPA proposes that EPA published congener Method 1668 Revision and detection levels shall be used for reporting purposes only. Prior to the promulgation of Method 1668, the 0.2 µg/l minimum quantification level (MQL) listed in Appendix to Part II shall be used for compliance purposes. EPA has developed MQLs to monitor compliance for permit limits below analytical values and uses those MQLs to establish defensible permits, so it is common for a MQL greater than the NMWQS. Since EPA has not coded Method 1668 neither developed MQLs for the method, both Method 1668 and its MQLs are not defensible by EPA for compliance purposes. If NMED requires Method 1668 to be used for compliance purposes and/or requires more stringent MQL for compliance purposes, NMED must specify those conditions in the State's Condition of Certification. The public notice for this proposed permit also provides notice that the State of New Mexico will be accepting comments for the State's CWA 401 certification and includes contact information for that process.

The human health-based limitation of 0.00064 μg/l was included in the administratively continued permit because that limitation was also based on the condition of State certification. The NMWQS, section 20.6.4.900.J (f) states "the criteria listed under human health-organism only (HH-OO) are intended to protect human health when aquatic organisms are consumed from waters containing pollutants. These criteria do not protect the aquatic life itself; rather, they protect the health of humans who ingest fish or other aquatic organisms." EPA understands that the HH-OO standards apply to the receiving stream, but has difficulty evaluating the human health impact of the discharge when ingestion of fish or other aquatic organism is unlikely to occur. EPA proposes to retain the monitoring frequency of 1/year for PCBs based on the case-by-case discretionary after considering the following facts: 1) an adverse impact to human health is not imminent; 2) PCBs have been prohibited for decades and LANL is not using PCBs in any process; 3) PCBs were likely deposited in the sewer system and the sewage flow rate is quite constant; 4) LANL has demonstrated its efforts to remove PCBs from discharges; and 5) the cost of Method 1668 is relatively high to the benefit obtained. Because HH-OO standards are established at the receiving water, EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The newly calculated PCB limitation is 0.000642 μg/l. LANL may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS during the public comment period, so EPA may conduct a new RP screening and/or establish a new effluent limitation based on new flow information.

EPA determines not to retain the PCB effluent limitations of 0.009 μg/l and 0.014 μg/l based on the wildlife habitat and aquatic life standards because the discharge has no RP to exceed the standards for wildlife habitat and aquatic life based on data collected using the congener method.

5. Whole Effluent Toxicity (WET)

Procedures for implementing WET terms and conditions in NPDES permits are contained in the NMIP, March 15, 2012. Table 11 of Section V of the NMIP outlines the type of WET testing for different types of discharges.

OUTFALL 001

The administratively continued permit established WET biomonitoring with CD = 100%. DMR reports reveal three (3) passing test for both the *Ceriodaphnia dubia* and *Pimephales promelas* species during the last permit term. The EPA Reasonable Potential Analyzer (See Appendix A) indicates that RP exists solely due to the limited number of test results used for RP analysis. Since LANL has not failed a WET test during their last permit term and is conducting tests at the maximum critical dilution, EPA concludes that this effluent does not cause or contribute to an exceedance of the State water quality standards. Therefore, WET limits will not be established in the proposed permit.

The critical dilution, CD, for this discharge is and will remain at 100% because the discharge is to an ephemeral/intermittent water body, but creates a perennial stream, Segment 20.6.4.126. Based on the nature of the discharge, industrial power plant/Sanitary Effluent Reclamation Facility (SERF), and the nature of the receiving water; perennial stream, the Table 11 of the NMIP directs the WET test to be a 7 day chronic test using *Ceriodaphnia dubia* and *Pimephales promelas* at a once per 5 year frequency. The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%.

OUTFALL 03A027

The discharge at Outfall 03A027 is to the Rio Grande Basin segment 20.6.4.126 that encompasses the perennial receiving water, discharge to perennial portion of Sandia canyon from Sigma canyon upstream to LANL NPDES outfall 001.

An acute WET testing requirement with a 80% CD was established in the administratively continued permit because the NMIP establishes an acute-to-chronic ratio (10:1) when the critical dilution falls below 10% (*e.g.* An 8% critical dilution = 80% critical dilution for an acute test). The EPA Reasonable Potential Analyzer for Outfall 03A027 indicates that RP exists for *Daphnia pulex* and *Pimephales promelas*. But since reasonable potential for an excursion of toxicity does not actually exist because lethal (acute test) toxic events were not demonstrated, WET limits will not be established in the proposed permit for Outfall 03A027. Since the critical dilution is risen to 23%, the acute to chronic ratio (which would require an acute CD of 230%) is no longer applicable and chronic testing will be used in lieu of acute testing.

Facilities with discharges that qualify as minor (e.g. treated cooling water blow down that is characteristic of other industry) such as outfall 03A027 will have an one-time effluent characterization WET requirement that consists of chronic WET testing for the *Ceriodaphnida dubia* and *Pimephales promelas* test species. For outfall 03A027, table 11 of the NMIP directs the WET test to be a 7 day chronic test using at a once per five (5) years frequency.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 10%, 13%, 17%, 23%, and 31%. The low-flow effluent concentration (critical low-flow dilution) is defined as 23% effluent.

Since the testing frequencies for the outfall listed in this section is once a year or less, the tests should all occur in winter or springtime when most sensitive juvenile life forms are likely to be present in receiving water and colder ambient temperatures might adversely affect treatment processes. This time will generally be defined as between November 1st and April 30th.

Because the discharge at Outfall 03A027 passed acute WET test during the administratively continued permit term, if the discharge passes the chronic WET test during this permit term, EPA may waive the WET test in the future permit term at this outfall if the nature of discharge is not significantly changed.

OUTFALL 03A199

Facilities with discharges that qualify as minor (e.g. treated cooling water that is characteristic of other industry) such as outfall 03A199 will have an effluent characterization single WET sample event. A chronic WET test with a CD of 35% was established in the administratively continued permit and the discharge has passed the test. Because the discharge has reduced its flow, a new CD is calculated to be 10%. Because the discharge has demonstrated "pass" at a higher CD, EPA determines that further WET test is not required in accordance with the NMIP. A WET testing is not established at this outfall.

OUTFALLS 13S, 03A113, 03A048, 03A160, 03A181, and 05A055

The receiving water, Cañada del Buey for outfall 13S, Sandia canyon for outfall 03A113, Los Alamos canyon for outfall 03A048, Mortandad canyon for outfall 03A160 and 03A181, Water canyon and Cañon de Valle for outfall 05A055 are classified as Rio Grande Basin segment 20.6.4.128 waterbodies.

The NMIP classifies 20.6.4.128 waterbodies as ephemeral or intermittent. Because those waterbodies are designated for limited aquatic life use, EPA applies guidelines for ephemeral stream to determine the type and frequency of WET requirements. Facilities with discharges that qualify as minor (sanitary waste discharge with flow over 0.1 MGD but less than 1.0 MGD) such as outfall 13S will have WET requirements that consist of WET testing for the *Daphnia pulex* test species. For outfall 13S, table 11 of the NMIP directs the WET test to be a 48-hour acute test using *Daphnia pulex* at a once per two years frequency.

Other outfalls that qualify as a minor industrial (excluding some operations such as aquifer remediation and drinking water treatment facilities) such as 03A113, 03A048, 03A160, 03A181, and 05A055 and discharge to ephemeral waterbodies will have WET requirements of an effluent characterization single WET sample event by 48-hour acute test using *Daphnia pulex*. The critical dilution (CD) will be 100% since discharges at those outfalls referenced in this section are to ephemeral streams. Because the WET testing result for Outfalls 03A048, 03A113, 03A160 and 03A181 already demonstrated "pass" of 100% acute WET test, WET requirements are not proposed for these outfalls. There was no discharge at Outfall 05A055 and no WET result could demonstrate a "pass" of 100% acute WET for the discharge, therefore WET requirements are retained for Outfall 05A055.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%. The low-flow effluent concentration (critical low-flow dilution) is defined as 100% effluent. A 3 hour composite rather than a 24 hour composite sample is established for Outfall 05A055 because this discharge will be likely intermittent. The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

Since the testing frequencies for all outfalls listed in this section are once a year or less, the tests should all occur in winter or springtime when most sensitive juvenile life forms are likely to be present in receiving water and colder ambient temperatures might adversely affect treatment processes. This time will generally be defined as between November 1st and April 30th.

OUTFALL 051

The administratively continued permit has WET biomonitoring requirement with CD = 100%. DMR reports reveal nine (9) failing tests out of a total of fifteen (15) tests for the *Daphnia pulex* test species during the last permit term. The EPA Reasonable Potential Analyzer indicates that RP exists. EPA concludes that this effluent causes or contributes to an exceedance of the State water quality standards. Therefore WET limits will be established in the proposed permit.

EPA proposes to establish WET requirements for Outfall 051 based on requirements for a major discharge because of the nature of discharge, industrial and radioactive wastewater. Facilities that qualify as majors and discharge to ephemeral waterbodies will have WET requirements that consist of a 100% critical dilution and a 48-hour acute test using *Daphnia pulex* at a once per three (3) months frequency when a WET limit is established. Since the flow from this outfall is intermittent, A 3 hour composite rather than a 24 hour composite sample is established because the discharge is intermittent. The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%. The low-flow effluent concentration (critical low-flow dilution) is defined as 100% effluent. Monitoring and reporting requirements begin on the effective date of this permit. March 1, 2016, is proposed as compliance deadline for the Whole Effluent Toxicity limitations.

Because the WET test failures might be caused by low hardness effluent and LANL has adjusted its process to raise effluent hardness and the permit also establishes hardness limit at Outfall 051, EPA will reevaluate the WET RP based on new WET results during the next permit renewal process.

7. Sewage Sludge Management

LANL plans to compost biosolids at the Sanitary Wastewater System Plant and apply composted solids for beneficial uses. Since August 1, 2012, LANL has submitted its Registration package to NMED-Solid Waste Bureau and Notice of Intent to Discharge to NMED-Groundwater Quality Bureau for approval. LANL is also working with NMED-SWQB to resolve SWQB's concerns about storm runoffs.

VI. CWA 303(d) IMPAIRED WATER

Most of the streams within LANL property are impaired waterbodies and industrial point sources have been identified as one of several probable sources of impairment for Mortandad Canyon (where Outfalls 03A022, 03A181 and 051 discharge to) and Canada del Buey (where Outfall 13S discharges to). Industrial point sources were not identified as probable sources for other streams. Because EPA has conducted RP for discharge at each outfall and established effluent limitations if RP was demonstrated; and also because EPA realizes that most of those streams have been contaminated by pollutants carried by historical storm water runoff from Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs) and EPA has issued an individual stormwater permit (NM0030759) to address storm runoffs from those AOCs and SWMUs; EPA determines that it is not necessary to require additional effluent data from these outfalls. NMED has also determined not to take any monitoring action to address the impairment issue for the next 10 years. If TMDLs for these impaired waterhodies are approved in the future, EPA will establish effluent limitations accordingly.

VII. ANTIDEGRADATION

The NMAC, Section 20.6.4.8 "Antidegradation Policy and Implementation Plan" sets forth the requirements to protect designated uses through implementation of the State water quality standards. The limitations and monitoring requirements set forth in the proposed permit are developed from the State water quality standards and are protective of those designated uses. Furthermore, the policy sets forth the intent to protect the existing quality of those waters, whose quality exceeds their designated use. The permit requirements and the limits are protective of the assimilative capacity of the receiving waters, which is protective of the designated uses of that water, NMAC Section 20.6.4.8.A.2.

VIII. ANTIBACKSLIDING

The proposed permit is consistent with the requirements to meet antibacksliding provisions of the Clean Water Act, Section 402(o) and 40 CFR §122.44(l), which state in part that effluent limitations must be as stringent as those in the previous permit. If new effluent data demonstrates no RP for WQ-based limitations, those limitations are removed based on 40 CFR §122.44 (l)(B), new information that was not available at the time the previous permit was issued and was discussed in Part V above. WQ-based effluent limitations may be changed due to new discharge flow rate, new stream flow rate, or new criteria.

IX. HISTORICAL and ARCHEOLOGICAL PRESERVATION CONSIDERATIONS

The reissuance of the permit should have no impact on historical and/or archeological sites since such sites are not found in the mining area.

X. PERMIT REOPENER

Pursuant to the provision of 40 CFR 122.62, this permit may be reopened for modification.

XI. VARIANCE REQUESTS

No variance requests have been received.

XII. CERTIFICATION

The permit is in the process of certification by the State Agency following regulations promulgated at 40 CFR 124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service prior to the publication of that notice.

XIII. FINAL DETERMINATION

The public notice describes the procedures for the formulation of final determinations.

XIV. ADMINISTRATIVE RECORD

The following information was used to develop the proposed permit:

A. APPLICATION(s)

EPA Application Form 2C package received February 8, 2012.

B. STATE OF NEW MEXICO REFERENCES

New Mexico State Standards for Interstate and Intrastate Surface Water, 20.6.4 NMAC, as amended through November 20, 2012.

Procedures for Implementing National Pollutant Discharge Elimination System Permits in New Mexico, March 15, 2012.

State of New Mexico 303(d)/305(b) Integrated Report, 2012 - 2014.

Los Alamos
NATIONAL LABORATORY

Environmental Protection Division
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National Nuclear Security Administration
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Date: AUG 1 3 2013
Symbol: ENV-DO-13-0115
LAUR: 13-26245

Ms. Diane Smith
U. S. Environmental Protection Agency
Permit Processing Team (6W-NP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Smith:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, COMMENTS ON DRAFT NPDES PERMIT ISSUED JUNE 29, 2013

Enclosed are comments submitted by the U. S. Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) regarding the new draft National Pollutant Discharge Elimination System (NPDES) Permit for the wastewater treatment facilities at the Los Alamos National Laboratory. DOE/LANS wish to acknowledge the efforts of the EPA Region 6 staff, especially Isaac Chen, who prepared the new draft permit and documentation package.

Please enter this letter and the enclosed comments into the record of proceedings for NPDES Permit No. NM0028355. DOE/LANS respectively requests that EPA consider these comments and include the proposed revisions into the final permit. Please be assured that DOE/LANS are fully committed to comply with all requirements set forth in the final NPDES Permit.

Please contact Marc Bailey of the Laboratory's Environmental Compliance Programs (ENV-CP) by telephone at (505) 665-8135 or Gene Turner at (505) 667-5794 of the DOE Los Alamos Field Office if you have questions regarding these enclosed comments or if additional information would be helpful.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security, LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
Department of Energy

EXHIBIT A

AMD:GET:MS/lm

Enclosures: 1. Comments on draft NPDES Permit No. NM0028355 issued on June 29, 2013

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, w/enc.
Steven M. Yanicak, NMED/DOE/OB, w/enc., (E-File)
Gene E. Turner, NA-OO-LA, w/enc., (E-File)
Carl A. Beard, PADOPS, w/o enc., A102
Michael T. Brandt, ADESH, w/o enc., (E-File)
Alison M. Dorries, ENV-DO, w/o enc., (E-File)
Anthony R. Grieggs, ENV-CP, w/enc., (E-file)
Michael T. Saladen, ENV-CP, w/o enc., (E-File)
Marc A. Bailey, ENV-CP, w/enc., K490 (E File)
Brett S. Henrikson, LC-LESH, w/enc., (E File)
LASOmailbox@nnsa.doe.gov, w/enc., (E-File)
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ENV-CP Correspondence File, w/enc., K490

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General Comments:

1. The Department of Energy and Los Alamos National Security, LLC (DOE/LANS) support the EPA's proposed limitations on the use of the PCB congener method for reporting purposes only and not for enforcement purposes.

   The draft permit properly excludes use of EPA Method 1668 for compliance purposes: it is not a 40 CFR Part 136-approved method. EPA issued a proposal (FR Vol. 75, No. 222, November 18, 2010) to incorporate the method into 40 CFR Part 136 and accepted comments addressing the validity of the method. EPA received comments from 35 respondents; only five (three states, one laboratory, and one laboratory organization) supported inclusion into Part 136. On May 18, 2012 EPA withdrew the proposed incorporation of the method (FR Vol. 77 No. 97, May 18, 2012).

   Moreover, LANL is the only known facility in New Mexico where the congener method is being used to determine compliance with an NPDES permit limit. The proposal to use Method 1668 for monitoring and reporting only is consistent with all other New Mexico NPDES permits that specify use of the method.

   As EPA notes, the NMED Surface Water Quality Bureau stated in a December 20, 2012 letter that "the State will condition the permit certification to require the use of Method 1668, most recent version thereof, with appropriate method specific MQLs, for purpose of PCB monitoring." DOE/LANS are submitting comments in opposition to the SWQB's proposed certification condition.

2. DOE/LANS request inclusion of schedules for compliance in the final permit, if necessary to address requirements incorporated into the final permit.

   EPA and NMED have allowed, on a case-by-case basis, the inclusion of a schedule of compliance in NPDES permits issued to an existing facility (40 CFR 122.47 and 20.6.4.12.G NMAC, respectively). The schedule of compliance provides the permittee with adequate time to make necessary modifications to treatment systems and/or operations at the facility to comply with permit limits. DOE/LANS do not request a compliance schedule for specific requirements in the draft permit but will need to evaluate if compliance schedules are necessary to address any new or revised permit requirements incorporated into the final NPDES permit issued by EPA.

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Additionally, DOE/LANS request an opportunity to review and respond to requirements specified in the New Mexico 401 certification, and public comments or concerns submitted to EPA during the comment period prior to issuance of the final permit.

3. DOE/LANS request elimination of the requirements related to selenium at Outfalls 03A027, 03A048, and 03A199 because there is no reasonable potential (RP) for selenium water quality standard exceedances.

   The fact sheet for the draft permit indicates an RP for selenium water quality standard exceedances at Outfalls 03A027, 03A048 and 03A199. The appearance of selenium in samples taken at LANL cooling towers is a false positive caused by bromine analytical interference. These cooling towers routinely use bromine as a biocide.

   It has been well established that when using EPA Method 200.8 (ICP-MS) for selenium analyses and bromine is present in the waste stream, there will be a positive interference and selenium will appear to be present in the sample. DOE/LANS documented this occurrence in comments submitted to EPA in 2006 on the current permit. As a result, the DOE/LANS used SW 846 Method 7742 (included in Section G. Test Methods in Part II of the current permit) for selenium monitoring and reporting purposes during the existing permit monitoring period. However, during sampling, analyses and reporting for DOE/LANS's NPDES Reapplication Project (Summer/Fall 2011), some selenium results were reported on the EPA's application Form 2C using EPA Method 200.8. These results indicated the presence of selenium, but they are false positives due to the presence of bromine. Upon discovery of the false positives, split samples from Summer/Fall 2011 were sent to the analytical laboratory for selenium re-analysis using SW 846 7742. The split sample results confirm that selenium is not present in the samples (see Table 1). More recent sample results are also included in Table 1. Tables 3, 4, and 5 apply the data analyzed by SW 846 Method 7742 in the recalculation of the RP for selenium for Outfalls 03A027 (Table 3), 03A048 (Table 4), and 03A199 (Table 5). Based on the RP recalculations, there is no reasonable potential for selenium water quality standard exceedances at these outfalls. Therefore, DOE/LANS requests that the selenium requirements for these outfalls be deleted from the permit.

4. For the sake of clarity regarding electronic reporting requirements, DOE/LANS request that EPA delete Part I.B. Reporting of Monitoring Results (Major Discharges) from the draft permit, and retain only Part III.D.4 Discharge Monitoring Reports and Other Reports of this permit until the proposed NPDES Electronic Reporting Rule (FR/Vol. 78, No.146/July 30, 2013) is promulgated.

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Page 23 of Part I. B Reporting of Monitoring Results (Major Discharges) states, in part: "Monitoring information **shall be submitted electronically** [emphasis added] as specified in Part III.D.4 of this permit…". On the other hand, Part III.D.4 Discharge Monitoring Reports and Other Reports states, in part: "Monitoring results must be reported to EPA on **either the electronic or paper** [emphasis added] Discharge Monitoring Report (DMR) approved formats. Monitoring results **can be** [emphasis added] submitted in lieu of the paper DMR Form… " These potentially conflicting provisions, if retained in the final permit, would leave it unclear as to whether and which monitoring results must be submitted electronically.

Additionally, on July 30, 2013 EPA the proposed "NPDES Electronic Reporting Rule" that would require electronic reporting for current paper-based NPDES Reports. Comments on this proposed rule must be received by October 28, 2013. It is not clear how the final version of this rule, if promulgated would affect the current draft permit requirements.

Deletion of Part I. B Reporting of Monitoring Results (Major Discharges) would allow DOE/LANS the option of reporting electronically or with paper until promulgation of the new rule provides clarity on EPA electronic reporting requirements.

5. DOE/LANS request reduction in sampling frequencies at Outfalls 051 and 03A160 to once-per-week based on low discharge volumes and frequencies, and NMIP guidelines.

Page 35, Table 10: Recommended Monitoring Frequencies for Industrial Wastewater Permits, of the EPA Region 6's "Procedures for Implementing National Pollutant Discharge Elimination System Permits in New Mexico – NMIP" recommends sampling frequencies for conventional pollutants, nonconventional pollutants, metals and toxics at industrial sites, like Los Alamos National Laboratory. In particular, Table 10 in the NMIP recommends a sampling frequency of three per week for outfalls that discharge once per day, and recommends once per week sampling for outfalls (other than pH) that discharge once per week or less.

The Laboratory's TA-50 Radioactive Waste Treatment Facility (RLWTF) has not discharged since November 2010 as a result of using the mechanical evaporator. Additionally, RLWTF has constructed two Zero Liquid Discharge (ZLD) tanks that can passively evaporate treated effluent. The ZLD tanks are currently being processed for permitting under the NMED's Ground Water Discharge Permit program and are not currently in operation. Based on discharge records prior to November 2010, and with options of using the existing mechanical evaporator or new ZLD evaporation tanks, RLWTF would discharge to Outfall 051 only once or twice per week if evaporation is not an option.

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The cooling tower at TA-35 Building 124 (Outfall 03A160) discharges treated and untreated cooling water blow-down on an intermittent basis, based on the programmatic needs at the TA-35 National High Magnetic Field Laboratory (NHMFL). The TA-35 NHMFL cooling tower discharged an average of 6 times per month, with an average of 2700 gallons per discharge based on the flows recorded during the last year (July 2012 – June 2013). A typical discharge lasts only about 2-7 hours.

Sample frequencies of once-per-week are (1) adequate to demonstrate compliance with effluent limits and protection of human health and the environment at Outfalls 051 and 03A160, (2) more stringent than current permit requirements, and (3) consistent with NMIP guidelines.

6. DOE/LANS request the deletion of the WET monitoring and reporting requirements for Outfalls 001, 03A027, 03A160, and 03A199 based on past WET testing results.

   The draft permit properly deletes Whole Effluent Toxicity (WET) monitoring and reporting requirements for Outfalls 03A048, 03A113, 03A160, and 03A181. All four outfalls passed the required WET tests during the monitoring periods of the existing permit. WET monitoring and reporting requirements remain in the draft pennit for Outfalls 001, 03A027, 03A160 and 03A199. The EPA Reasonable Potential (RP) Analyzer spreadsheets for Outfalls 001, 03A027, 03A160, and 03A199 indicate that an RP exists for these four outfalls, however, these four outfalls also passed the required WET tests during the monitoring periods of the existing pennit, which demonstrated that treated discharges showed no observed lethal effect concentration in 100% effluent.

7. DOE/LANS request that the EPA notification and reporting requirements on Page 1 of Part II.B of the draft NPDES permit be consistent with the New Mexico Water Quality Control Commission regulations. DOE/LANS recommends 24-hour notification and a **7-day** reporting requirements for overflows he incorporated into Part II.B 24-HOUR ORAL REPORTING section.

   20.6.2.1203 NMAC requires submission of the same information regarding spills and overflows, a 24-hour oral notification requirement, and 7-day and 15-day written reports. As currently stated in the draft NPDES permit, EPA is generating an additional report (5-day) with the same information and no additional value.

8. DOE/LANS request EPA refrain from adding any new effluent limits into the final permit for Outfalls 05A055 and 051 at this time. Establishing new effluent limits prior to evaluating

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new data would be premature and not be representative of existing conditions and treatment at the facilities, and effluent quality discharged to the environment.

The TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) has not discharged to Outfall 051 since November 2010. Additionally, the TA-16 High Explosives Wastewater Treatment Facility (HEWTF) has not discharged to Outfall 05A055 since November 2007. As a result, DOE/LANS were unable to collect samples for Form 2C constituents at the time the permit re-application was submitted. In fact sheets of the permit re-application, DOE/LANS committed to collecting grab samples for the Form 2C constituents when the RLWTF and HEWTF discharge through the respective outfalls. DOE/LANS will submit these data to EPA and NMED on the Form 2C permit application, upon receipt of the data. These new data can be used to evaluate a reasonable potential for water quality standard exceedances. Page 3 of Part II.E. Reopener Clause, allows EPA to reopen and modify the permit during the life of the permit, in accordance with provisions in 40 CFR 122.62.

DOE/LANS request the opportunity to provide EPA with new data for Outfalls 051 and 05A055, if discharges through these outfalls are initiated during the life of the new permit. These data would be used by EPA to evaluate the reasonable potential of water quality standard exceedances, and to establish potential new effluent limits at the respective outfalls based on current treatment technology at the time of discharge.

Outfall Specific Comments:

Outfall 001:

1. DOE/LANS support that lack of aluminum monitoring and reporting requirements and notes that the "no RP" conclusion was based on proper sampling methods.

   Page 1 of Part I.A Effluent Limitations and Monitoring Requirements of the draft permit does not require aluminum monitoring and reporting at Outfall 001 because there is not a reasonable potential for a water quality standard exceedance. 20.6.4.900(I) (1) and (2) NMAC states that total recoverable aluminum criteria is based on samples that are filtered to minimize mineral phases. NMED SWQB (2013 Draft Assessment Protocol) concluded that a filter of 10μm pore size minimizes mineral-phase aluminum without restricting amorphous or colloidal phases. However, if turbidity of a sample is less than 30 NTU, no filtration is needed to minimize mineral phases. Samples with greater than 30 NTU must be filtered with 10μm disposable in-line capsule filter prior to analysis (SWQB Assessment Protocol – Public

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Draft 3/20/13). Turbidity at Outfall 001 is not greater than 30 NTU; therefore proper sampling methods were used.

2. Page 2 of Part I.A Effluent Limitations and Monitoring Requirements of the draft permit requires Whole Effluent Toxicity (WET) monitoring and reporting. DOE/LANS request the deletion of the WET monitoring and reporting requirements for Outfall 001 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

3. Page 1 of Part I, top of page, should read OUTFALL 001 (TA-3-22).

Outfall 13S:

1. DOE/LANS request the Latitude/Longitude modification be incorporated into the permit to identify the change in sampling location. Page 3 of Part I of the draft permit identifies the discharge location for Outfall 13S at Latitude 35^{0}51'08"N, Longitude 106^{0}16'33"W. As stated in the 2012 NPDES permit re-application, the discharge location/sampling location for Outfall 13S is Latitude 35^{0}51'08"N, Longitude 106^{0}16'29"W. This is the location where Outfall 13S discharges into Canada del Buey.

2. Page 3 of Part I, top of page, should read: OUTFALL 13S - Sanitary Waste Water System (TA-46-347).

3. Public comments at the EPA Public Meeting on July 30, 2013 requested further information about composting activities at LANL. On August 15, 2012 the DOE/LANS notified EPA Region VI of its intent to compost and land apply biosolids at the Laboratory for beneficial use. The compost operation would take place at the Laboratory's TA-46 Sanitary Waste Water System (SWWS) Facility. Prior to initiating operations, the facility must register with the NMED's Solid Waste Bureau and provide a Notice of Intent to NMED's Ground Water Quality Bureau. The NOI and registration were submitted to NMED on July 31, 2012 and August 1, 2012 respectively. On December 21, 2012 DOE/LANS received a response from NMED suggesting the proposed land application would be surface disposal and not land application for beneficial use. LANS have consulted with NMED and intend to clarify and re-submit the NOI.

   Upon approval of the composting operation and land application method by NMED, Part IV-Element 1 of the draft NPDES permit sets out requirements and conditions for preparation and reuse of biosolids (compost). The requirements are based on 40 CFR Part 503

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regulations – Standards for the Use or Disposal of Sewage Sludge. The conditions in Part IV of the draft NPDES permit include: ceiling concentrations for metals and PCBs; monitoring and testing requirements; pathogen control; vector attraction reduction; general conditions; management practices; and, notification requirements. The draft permit and existing state and federal requirements adequately protect human health and the environment. Therefore no additional monitoring and reporting should be required.

Outfall 051:

1. Public comments brought up at the EPA Public Meeting on July 30, 2013 requested further information regarding prior WET testing at RLWTF and recommended that this information be incorporated into the fact sheet for Outfall 051. DOE/LANS do not oppose this information being provided in the fact sheet and/or response to comments. Detailed information regarding prior WET testing and DOE/LANS's related corrective actions can he found in the quarterly compliance reports submitted to EPA from 2007 – 2013.

2. Page 5 of Part I, top of page, should read: <u>OUTFALL 051 – Radioactive Liquid Waste Treatment Facility (TA-50-1)</u>.

3. DOE/LANS request the flow monitoring requirements be changed from continuous/record to an estimate/once-per-day basis. Page 5 of Part I.A <u>Effluent Limitations and Monitoring Requirements</u>, of the draft permit requires the flow frequency be monitored continuously/record. RLWTF has not discharged since November 2010. If discharges to the Outfall 051 resume, it is estimated that RLWTF would only discharge intermittently under batch treatment and release. Flow is currently measured and reported based on tank volume discharge.

4. DOE/LANS request that the definition of "estimate" for Outfall 03A022 be incorporated into the draft permit for Outfall 051. Page 6 of Part I.A. bottom of page, should read: <u>Flow Measurements</u>, "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

5. DOE/LANS request the sampling frequencies for copper, zinc and hardness be changed to once-per-week. Page 5 of Part I.A <u>Effluent Limitations and Monitoring Requirements</u> monitoring frequencies for copper and zinc have increased from once-per-month to three times per week. DOE/LANS request reduction in sampling frequencies for these constituents to once-per-week at Outfall 051 based on the NMIP. See General Comment #5.

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6. DOE/LANS request that the required 3-hr. composite WET test be replaced with a grab sample requirement. Page 6 of Part I.A Effluent Limitations and Monitoring Requirements of the draft permit requires a 3-hr. composite sample be collected for the WET testing purposes. Typical flow durations for discharges from RLWTF through Outfall 051 only last approximately 1-1.5 hours. The NMIP sample type for once-per-week discharges at industrial outfalls is generally by grab and is appropriate here.

Outfall 05A055:

1. DOE/LANS request that the new permit retain "Estimate" for the flow monitoring requirement at Outfall 05A055. Page 7 of Part I.A Effluent Limitations and Monitoring Requirements of the draft pennit requirements for flow monitoring changed from "Estimate" (in the current permit) to "Record". The current permit defines "Estimate" as flow values that are be estimated using best engineering judgment. Outfall 05A055 has not discharged since November 2007. Typical discharges prior to November 2007 were low in volume and short in duration.

Outfall 03A022:

1. Page 9 of Part I authorizes Outfall 03A022 to discharge storm water and roof drain water to Mortandad Canyon. DOE/LANS request that the permit also incorporate once through cooling into the discharge description (for emergency use only) at the top of page 9 of Part I, as stated on page 11 of the fact sheet. Page 9 of Part I, top of page, should read: "During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge storm water, **once through cooling (for emergency use only),** and roof drain water to Mortandad Canyon, in segment 20.6.4.128 of the Rio Grande Basin. (Cooling tower blowdown is not authorized for discharge at this outfall.)."

2. DOE/LANS request the outfall be renamed "04A022". Historically, non-contact cooling water was categorized by the 04A designation. Outfall category 03A of the current permit is for treated cooling tower water discharges. The outfall description for 03A022 specifically states "Cooling tower blowdown is not authorized for discharge at this outfall." Therefore, the change of outfall name to 04A022 is more appropriate.

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Outfall 03A027:

1. EPA's RP calculation sheet documents an RP for selenium, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. False positives for selenium at this cooling tower were caused by bromine analytical interference when using EPA Method 200.8. DOE/LANS request EPA not incorporate monitoring and reporting requirements or effluent limits in the permit for selenium at Outfall 03A027. See General Comment #3.

2. DOE/LANS request the deletion of the WET monitoring and reporting requirements for Outfall 03A027 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

3. Page 15 of Part I Outfall description at top of page should delete the reference to cooling tower TA3-285. Cooling tower TA3-285 has been inoperable for years and was demolished in 2012.

4. DOE/LANS request the sample frequency for E Coli be changed to two-per-month, as indicated in the fact sheet. Page 15 of Part I.A of the draft permit specifies an E. Coli monitoring frequency of two-per-week. However, page 11 (3rd paragraph) of the fact sheet states: "E. coli - Monitoring requirements and effluent limitations apply at Outfalls 001, 13S, or 03A027 where final treated sanitary wastewater actually discharges. The monitoring frequency is 2-per-month based on the frequency recommended in the NMIP for a municipal facility with activated sludge technology and a design flow of 0.1 < 0.5 MGD."

Outfall 03A048:

1. Page 17 of Part I.A Effluent Limitations and Monitoring Requirements of the draft permit require selenium monitoring of three-per-week, with a monthly average and daily maximum effluent limits of 5.0 mg/l. DOE/LANS request the monitoring/reporting requirements and the effluent limits for selenium be deleted based on false positive results using Method 200.8. See General Comment #3.

Outfall 03A160:

1. DOE/LANS request deletion of cyanide requirements at Outfall 03A160. Page 19 of Part I Effluent Limitations and Monitoring Requirements of the draft permit requires three-per-week monitoring and reporting, and contains a permit limit of 5.2 mg/l for cyanide. Cyanide

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is not used in operations of the cooling tower. The cyanide levels may have been a result of impacts from flying ash during the Las Conchas fire being deposited in the cooling tower. The cooling tower was off-line for an extended period of time during the fire and ash may have deposited in the cooling tower basin. The sample submitted for the re-application was collected shortly after the fire (July 18, 2011). Additional cyanide samples recently collected at 03A160 do not confirm the result from the July 18, 2011 sample. Table 2 contains the data collected after the permit application was submitted. When applying guidelines in the NMIP for additional samples, the geometric mean of the samples demonstrates that cyanide RP does not exist (see Table 6). In the alternative, if EPA retains cyanide requirements, DOE/LANS request a reduction in sampling frequency to once-per-week at Outfall 03A160.

2. Page 19 of Part I.A Effluent Limitations and Monitoring Requirements of the draft permit requires a monitoring frequency for copper at three times per week. DOE/LANS request a reduction in sampling frequency to once-per-week at Outfall 03A160 based on NMIP. See General Comment #5.

3. Page 19 of Part I.A Effluent Limitations and Monitoring Requirements requires WET monitoring at Outfall 03A160. DOE/LANS request the deletion of the WET monitoring and reporting requirements for Outfall 03A160 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

Outfall 03A199:

1. EPA's Fact Sheet and RP calculation sheets documents an RP for selenium at Outfall 03A199, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. False positives for selenium at this cooling tower were caused by bromine analytical interference. DOE/LANS request EPA not incorporate monitoring and reporting requirements or effluent limits in the permit for selenium at Outfall 03A199. See General Comment #3 Tables 1 and 5.

2. EPA's Fact Sheet and RP calculation sheets documents an RP for cyanide at Outfall 03A199 but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. The cyanide result in EPA's RP calculation sheet is documented at 13.6 µg/l. However, the NPDES Re-applications Form 2C documents a non-detect analytical result for cyanide (< 1.5 µg/l). DOE/LANS request that EPA not include monitoring and reporting requirements or permit requirements for cyanide because no reasonable potential exists (see Table 2 and 5).

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3. EPA's RP calculation sheet documents a reasonable potential for copper at Outfall 03A199, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. Based on the copper result of 13.2 µg/l and a hardness of 122 mg/l in the permit re-application Form 2C, the potential effluent limit should be 26.7 µg/l.

4. DOE/LANS request the deletion of the WET monitoring and reporting requirements for Outfall 03A199 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

TABLE 1

Selenium Data
Outfalls 03A027, 03A048, 03A113, and 03A199

Outfall	Field Sample ID	Chain Of Custody No.	Date Sampled	Parameter Name	Result	Report Units	Lab Qualifier	Detected	Analytical Method	Lab
03A027*	NPDES03A027-11-13855	12-358	11/16/2011	selenium	11.8	ug/L		Y	EPA:200.8	GEL
	NPDES03A027-11-13855	12-356	11/16/2011	selenium	1.02	ug/L	N	Y	SW-846:7742M	SwRI
03A048*	NPDES03A048-11-13856	433119	8/8/2011	selenium	2.8	ug/L	J	Y	EPA:200.8	GEL
	NPDES03A048-11-13856	458320	8/8/2011	selenium	0.922	ug/L	B	Y	SW-846:7742	SwRI
03A048*	NP048-13-38787	2013-1107	7/10/2013	selenium	5.95	ug/L		y	200.8	GEL
	NP048-13-38787	2013-1109	7/10/2013	selenium	1.00	ug/L		y	SW-846:7742	SwRI
03A048*	NP048-13-39240	2013-1231	7/18/2013	selenium	10.5	ug/L		y	200.8	GEL
	NP048-13-39241	2013-1232	7/18/2013	selenium	0.841	ug/L	B	Y	SW-846:7742	SwRI
03A048*	NP048-13-39242	2013-1295	7/22/2013	selenium	4.88	ug/L	J	Y	200.8	GEL
	NP048-13-39243	2013-1301	7/22/2013	selenium	0.88	ug/L	B	Y	SW-846:7742	SwRI
03A048*	NP048-13-39249	2013-1327	7/24/2013	selenium	< 1.50	ug/L	U	N	200.8	GEL
	NP048-13-39244	2013-1328	7/24/2013	selenium	0.83	ug/L		Y	SW-846:7742	SwRI
03A048*	NP048-13-39245	2013-1381	7/29/2013	selenium	15.10	ug/L		Y	200.8	GEL
	NP048-13-39248	2013-1382	7/29/2013	selenium	1.01	ug/L		Y	SW-846:7742	SwRI
03A048*	NP048-13-39246	2013-1440	7/31/2013	selenium	9.64	ug/L		Y	200.8	GEL
	NP048-13-39247	2013-1441	7/31/2013	selenium	0.81	ug/L		Y	SW-846:7742	SwRI
03A113*	NPDES03A113-11-13857	543422	8/31/2011	selenium	< 1.5**	ug/L	U	N	EPA:200.8	GEL
	NPDES03A113-11-13857	544153	8/31/2011	selenium	0.473	ug/L	B	Y	SW-846:7742	SwRI
03A199*	NPDES03A199-11-13860	543422	8/31/2011	selenium	5.2	ug/L		Y	EPA:200.8	GEL
	NPDES03A199-11-13860	544153	8/31/2011	selenium	0.856	ug/L	B	Y	SW-846:7742	SwRI
03A199*	NP199-13-39283	2013-1234	7/18/2013	selenium	5.01	ug/L		y	EPA:200.8	GEL
	NP199-13-39288	2013-1235	7/18/2013	selenium	0.856	ug/L	B	Y	SW-846:7742	SwRI
03A199*	NP199-13-39284	2013-1295	7/22/2013	selenium	2.82	ug/L	J	Y	EPA:200.8	GEL
	NP199-13-39289	2013-1301	7/22/2013	selenium	0.745	ug/L	B	Y	SW-846:7742	SwRI
03A199*	NP199-13-39286	2013-1381	7/29/2013	selenium	3.07	ug/L	J	Y	EPA:200.8	GEL
	NP199-13-39291	2013-1382	7/29/2013	selenium	0.732	ug/L	B	Y	SW-846:7742	SwRI
03A199*	NP199-13-39287	2013-1440	7/31/2013	selenium	1.97	ug/L	J	Y	EPA:200.8	GEL
	NP199-13-392292	2013-1441	7/31/2013	selenium	0.754	ug/L	B		SW-846:7742	SwRI

* Bromine used at Outalls 03A027, 03A048, 03A113, 03A199

** No RP- Recalculation unecessary

#.# Reported on Form 2C-positive interference

#.## Use to recalculate RP

Cyanide Data
Outfalls 03A160 and 03A199

Outfall	Field Sample ID	Chain Of Custody No.	Date Sampled	Parameter Name	Report Result	Screening Value (per NMIP)	Report Units	Lab Qualifier	Detected	Analytical Method	Lab
03A160	NPDES03A160-11-13858	349844	7/18/2011	Cyanide (Total)	0.0136	0.0136	mg/L		Y	EPA:335.4	GEL
03A160	NP160-13-39230	2013-1231	7/18/2013	Cyanide	< 0.00167	0.000835	mg/L	U	N	335.4	GEL
03A160	NP160-13-39231	2013-1295	7/22/2013	Cyanide	< 0.00167	0.000835	mg/L	U	N	335.4	GEL
03A160	NP160-13-39232	2013-1327	7/24/2013	Cyanide	< 0.00167	0.000835	mg/L	U	N	335.4	GEL
03A160	NP160-13-39233	2013-1381	7/29/2013	Cyanide	0.00234	0.00234	mg/L	J	Y	335.4	GEL
03A160	NP160-13-39234	2013-1440	7/31/2013	Cyanide	< 0.00167	0.000835	mg/L	U	N	335.4	GEL
					Geometric Mean*:	0.00157852	mg/L				

Outfall	Field Sample ID	Chain Of Custody No.	Date Sampled	Parameter Name	Report Result	Report Units	Lab Qualifier	Detected	Analytical Method	Lab
03A199	NPDES03A199-11-13860	543422	8/31/2011	Cyanide (Total)	< 0.0015**	mg/L	U	N	EPA:335.4	GEL
03A199	NP199-13-39283	2013-1234	7/18/2013	Cyanide	ND	ug/L	U	N	335.4	GEL
03A199	NP199-13-39284	2013-1295	7/22/2013	Cyanide	ND	ug/L	U	N	335.4	GEL
03A199	NP199-13-39285	2013-1327	7/24/2013	Cyanide	ND	ug/L	U	N	335.4	GEL
03A199	NP199-13-39286	2013-1381	7/29/2013	Cyanide	ND	ug/L	U	N	335.4	GEL
03A199	NP199-13-39287	2013-1440	7/31/2013	Cyanide	ND	ug/L	U	N	335.4	GEL

#.### Reported on Form 2C

* Geometric mean used in RP calculation in Table 6

** RP calculation for 03A199 has 13.6 ug/L entered for CN result which is the value used in the 03A160 RP calculation

TABLE 3

Outfall 03A027
Original EPA Region 6 RP Spreadsheet Using 11.8 ug/L Selenium

Permittee	LANL	
NPDES Permit No.	NM0028355	
Outfall No.(s)	03A027	
Plant Effluent Flow (MGD)	0.105	For industrial and federal facility, use the highest monthly average flow
Plant Effluent Flow (cfs)	0.16275	for the past 24 months. For POTWs, use the design flow
RECEIVING STREAM	DATA INPUT	
Receiving Stream Name	Sandia Canton	
Basin Name	Rio Grande	
Waterbody Segment Code No.	20 6 4.126	
Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not)	0	
Are acute aquatic life criteria considered (1= 1(MUST enter "1" for 2005 Stand	1	
Are chronic aquatic life criteria considered (1= yes, 0=no)	1	
Are domestic water supply criteria considered (1= yes, 0=no)	0	
Are irrigation water supply criteria considered (1= yes, 0=no)	0	
Livestock watering and wildlife habitat criteria applied to all streams		
USGS Flow Station	USGS	
WQ Monitoring Station No.	SJR	
Receiving Stream TSS (mg/l)	1.0833	Outfall 001's TSS
Receiving Stream Hardness (mg/l as $CaCO_3$) RANGE: 0 - 400	78.8	Outfall 001's Hardness
Receiving Stream Critical Low Flow (4Q3) (cfs)	0.55	Outfall 001's Long-term flow
Receiving Stream Harmonic Mean Flow (cfs)	0.55	Enter harmonic mean or modified harmonic mean flow data
Avg. Water Temperature (C)	17.1	
pH (Avg)	8.5	
Fraction of stream allowed for mixing (F)	1	Enter 1, if stream morphology data is not available or for intermittent streams
Fraction of Critical Low Flow	0.55	

RP Spreadsheet Using 1.02 ug/L Value for Selenium (Method 7742). No RP for Selenium.

POLLUTANTS	CAS No.	MQL	Ambient Conc Ca (ug/l)	Effluent Conc Ce (ug/l)	Instream Waste Concentration: Acute Aquatic 2.13*Ce	Domestic Supply Cd,dom (ug	Chronic Aquatic Cd (ug/l)	Human Health Cd,hh (ug/l	Livestock& Domestic Criteria ug/l	Acute Irrigation Criteria ug/l	Chronic Wildlife Criteria ug/l	Human Aquatic Criteria ug/l	Need Aquatic Criteria ug/l	RP Spreadsheet Using 1.02 ug/L: Ambient Conc Ca (ug/l)	RP Spreadsheet Using 1.02 ug/L: Effluent Conc Ce (ug/l)
Mercury, dissolved	7439-97-6	0.005			0	0	0	0	1E+100	1E+100	1E+100	1.4	0.77		
Mercury, total	7439-97-6	0.005			0	0	0	0	2	1E+100	0.77	1E+100	1E+100		
Molybdenum, dissolve	7439-98-7				0	0	0	0	1E+100	1000	1E+100	1E+100	1E+100		
Molybdenum, total rec	7439-98-7				0	0	0	0	1E+100	1E+100	1E+100	7920	1895		
Nickel, dissolved (P)	7440-02-0	0.5		0.72965	1.554588	0.354976	0.354976	0.354976	700	1E+100	1E+100	382.7593	42.51274		0.729653
Selenium, dissolved (P	7782-49-2	5		11.8	25.134	5.739121	5.739121	5.739121	50	130	50	1E+100	1E+100		1.02
Selenium, dis (SO4 >500 mg/l)		5			0	0	0	0	50	250	50	1E+100	1E+100		
Selenium, total recove	7782-49-2	5		11.8	25.134	5.739121	5.739121	5.739121	1E+100	1E+100	5	20	5		1.02
Silver, dissolved	7440-22-4	0.5		0	0	0	0	0	1E+100	1E+100	1E+100	2.135224	1E+100		0
Thallium, dissolved (P)	7440-28-0	0.5			0	0	0	0	2	1E+100	1E+100	1E+100	1E+100		
Zinc, dissolved	7440-66-6	20		1.62255	3.456022	0.789151	0.789151	0.789151	10500	2000	25000	128.834	97.60976		1.622546
Cyanide, total recovera	57-12-5	10			0	0	0	0	200	1E+100	5.2	22	5.2		
Dioxin	1764-01-6	0.00001			0	0	0	0	3.00E-05	1E+100	1E+100	1E+100	1E+100		

POLLUTANTS	CAS No.	STORET		Domestic Limits	Irrigation Limits	Livestock or Wildlife Limits	Acute Aquatic Limits	Chronic Aquatic Limits	Human Health Limits	Daily Max Conc ug/l	Monthly Avg Conc ug/l	Daily Max Total ug/l	Mon. Avg Total ug/l	RP Spreadsheet Using 1.02 ug/L: Daily Max Total ug/l	RP Spreadsheet Using 1.02 ug/L: Mon. Avg Total ug/l
METALS AND CYANIDE, as Total															
Antimony, Total (P)	7440-36-0	01097		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic, Total (P)	7440-38-2	1002		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium, Total	7440-41-7	01012		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium, Total	7440-43-9	01027		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium (III), dissolv	16065-83-1	01033		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium (VI), dissolv	18540-29-9	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium, Total	7440-47-3	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copper, Total	7440-50-8	01042		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead, Total	7439-92-1	01051		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese, dissovied	7439-96-5	01056		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury, Total	7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury, Total	7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum, dissolve	7439-98-7	1060		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum, total rec	7439-98-7	01062		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nickel, Total (P)	7440-02-0	01067		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total (P)	7782-49-2	01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total (SO4 >500 mg/l)		01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total recov	7782-49-2	01147		N/A	N/A	21.89708	20	21.89708	N/A	20	13.33333	20	13.33333	N/A	N/A
Silver, Total	7440-22-4	01077		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium, Total (P)	7440-28-0	01059		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zinc, Total	7440-66-6	1092		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyanide, total recovera	57-12-5	00720		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: No limits in draft permit for selenium

Recommend no permit limit for selenium.

TABLE 4

Outfall 03A048
Original EPA Region 6 Spreadsheet using 2.8 ug/L Selenium Value

17	A	B	C	D	E	F	G	I	J	K	L	M	N	O	P
18	Permittee							LANL							
19	NPDES Permit No							NM0028355							
20	Outfall No.(s)							03A048							
21	Plant Effluent Flow (MGD)							0.104			For industrial and federal facility, use the highest monthly average flow				
22	Plant Effluent Flow (cfs)							0.1612			for the past 24 months. For POTWs, use the design flow				
23															
24	RECEIVING STREAM							DATA INPUT							
25															
26	Receiving Stream Name							Los Alamos Canyon							
27	Basin Name							Rio Grande							
28	Waterbody Segment Code No.							20.6.4.126							
29	Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not)							0							
30	Are acute aquatic life criteria considered (1{(MUST enter "1" for 2005 Stand							1							
31	Are chronic aquatic life criteria considered (1= yes, 0=no)							0							
32	Are domestic water supply criteria considered (1= yes, 0=no)							0							
33	Are irrigation water supply criteria considered (1= yes, 0=no)							0							
34	Livestock watering and wildlife habitat criteria applied to all streams														
35															
36	USGS Flow Station							USGS							
37	WQ Monitoring Station No.							SJR							
38	Receiving Stream TSS (mg/l)							1		For intermittent stream, enter effluent TSS					
39	Receiving Stream Hardness (mg/l as $CaCO_3$)					RANGE: 0 - 400		179		For intermittent stream, enter effluent Hardness (if no data, 20 mg/l is used)					
40	Receiving Stream Critical Low Flow (4Q3) (cfs)							0		Enter "0" for intermittent stream and lake					
41	Receiving Stream Harmonic Mean Flow (cfs)							0.00155		Enter harmonic mean or modified harmonic mean flow data					
42	Avg. Water Temperature (C)							20.3							
43	pH (Avg)							8.4							
44	Fraction of stream allowed for mixing (F)							1		Enter 1, if stream morphology data is not available or for intermittent streams.					
45	Fraction of Critical Low Flow							0							
139							Instream Waste Concentration				Livestock/Wil	Acute	Chronic	Human	Need
140					Ambient	Effluent	Acute	Domestic	Chronic	Human	Domestic	Irrigation	Wildlife	Aquatic	Aquatic
141	POLLUTANTS				Conc	Conc.	Aquatic	Supply	Aquatic	Health	Criteria	Criteria	Criteria	Criteria	Criteria
142			CAS No.	MQL	Ca (ug/l)	Ce (ug/l)	2.13*Ce	d,dom (ug	Cd (ug/l)	Cd,hh (ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
143	Mercury, dissolved		7439-97-6	0.005			0	0	0	0	1E+100	1E+100	1E+100	1.4	0.77
144	Mercury, total		7439-97-6	0.005			0	0	0	0	2	1E+100	0.77	1E+100	1E+100
145	Molybdenum, dissolv		7439-98-7				0	0	0	0	1E+100	1000	1E+100	1E+100	1E+100
146	Molybdenum, total re		7439-98-7				0	0	0	0	1E+100	1E+100	1E+100	7920	1895
147	Nickel, dissolved (P)		7440-02-0	0.5		0.604027	1.288577	1.288577	1.288577	1.274324	700	1E+100	1E+100	788.2837	85.10624
148	Selenium, dissolved (		7782-49-2	5		2.8	5.964	5.964	5.964	5.9072	50	130	50	1E+100	1E+100
149	Selenium, dis (SO4 >500 mg/l)			5			0	0	0	0	50	250	50	1E+100	1E+100
150	Selenium, total recov		7782-49-2	5		2.8	5.964	5.964	5.964	5.9072	1E+100	1E+100	5	20	5
151	Silver, dissolved		7440-22-4	0.5		0	0	0	0	0	1E+100	1E+100	1E+100	8.756388	1E+100
152	Thallium, dissolved (		7440-28-0	0.5			0	0	0	0	2	1E+100	1E+100	1E+100	1E+100
153	Zinc, dissolved		7440-66-6	20		0	0	0	0	0	10500	2000	25000	271.8804	205.8552
154	Cyanide, total recove		57-12-5	10			0	0	0	0	200	1E+100	5.2	22	5.2
155	Dioxin		1764-01-6	0.00001			0	0	0	0	3.00E-05	1E+100	1E+100	1E+100	1E+100
277								Livestock	Acute	Chronic	Human	Daily	Monthly	Daily Max	Mon. Avg
278	POLLUTANTS		CAS No.	STORET		Domestic	Irrigation	or Wildlife	Aquatic	Aquatic	Health	Max Conc	Avg Conc	Total	Total
279						Limits	Limits	Limits	Limits	Limits	Limits	ug/l	ug/l	ug/l	ug/l
286	METALS AND CYANIDE, as Total														
296	Antimony, Total (P)		7440-36-0	01097		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
297	Arsenic, Total (P)		7440-38-2	1002		N/A	N/A	N/A	N/A	N/A	0.066538	0.066539	6	13.44805	13.32
298	Beryllium, Total		7440-41-7	01012		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
299	Cadmium, Total		7440-43-9	01027		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	Chromium (III), dissol		16065-83-1	01033		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301	Chromium (VI), disso		18540-29-9	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302	Chromium, Total		7440-47-3	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
303	Copper, Total		7440-50-8	01042		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
304	Lead, Total		7439-92-1	01051		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
305	Manganese, dissolve		7439-96-5	01056		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
306	Mercury, Total		7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
307	Mercury, Total		7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
308	Molybdenum, dissolv		7439-98-7	1060		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
309	Molybdenum, total re		7439-98-7	01062		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
310	Nickel, Total (P)		7440-02-0	01067		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
311	Selenium, Total (P)		7782-49-2	01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
312	Selenium, Total (SO4		>500 mg/l	01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
313	Selenium, Total recov		7782-49-2	01147		N/A	N/A	5	N/A	N/A	N/A	5	5	5	5
314	Silver, Total		7440-22-4	01077		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
315	Thallium, Total (P)		7440-28-0	01059		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
316	Zinc, Total		7440-66-6	1092		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
317	Cyanide, total recove		57-12-5	00720		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

RP Spreadsheet Using 0.922 ug/L Value for Selenium (Method 7742). No RP for Selenium.

Ambient	Effluent
Conc	Conc
Ce (ug/l)	Ce (ug/l)
	0.80403
	0.922
	0.922
	0
	0
Daily Max	Mon. Avg
Total	Total
ug/l	ug/l
N/A	N/A
13.4481	13.32
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

Recommend no permit limit for selenium

TABLE 5

Outfall 03A199 Ephemeral
Original EPA Region 6 RP Spreadsheet Using 5.2 ug/L Selaium and 13.6 ug/L Cyanide Values

	B	J	K–Q
17	B	J	
18	Permittee	LANL	
19	NPDES Permit No.	NM0028355	
20	Outfall No.(s)	03A199	
21	Plant Effluent Flow (MGD)	0.0395	For industrial and federal facility, use the highest monthly average flow
22	Plant Effluent Flow (cfs)	0.061225	for the past 24 months. For POTWs, use the design flow
23			
24	RECEIVING STREAM	DATA INPUT	
25			
26	Receiving Stream Name	Sandia Canyon	
27	Basin Name	Rio Grande	
28	Waterbody Segment Code No.	20 6 4.128	
29	Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not)	0	
30	Are acute aquatic life criteria considered (1=(MUST enter "1" for 2005 St	1	
31	Are chronic aquatic life criteria considered (1= yes, 0=no)	1	
32	Are domestic water supply criteria considered (1= yes, 0=no)	0	
33	Are irrigation water supply criteria considered (1= yes, 0=no)	0	
34	Livestock watering and wildlife habitat criteria applied to all streams		
35			
36	USGS Flow Station	USGS	
37	WQ Monitoring Station No.	SJR	
38	Receiving Stream TSS (mg/l)	4.3	Outfall 001's TSS
39	Receiving Stream Hardness (mg/l as CaCO3) RANGE: 0 - 400	122	Outfall 001's Hardness
40	Receiving Stream Critical Low Flow (4Q3) (cfs)	0	Outfall 001's Long-term flow
41	Receiving Stream Harmonic Mean Flow (cfs)	0.00156	Enter harmonic mean or modified harmonic mean flow data
42	Avg. Water Temperature (C)	21.4	
43	pH (Avg)	8.2	
44	Fraction of stream allowed for mixing (F)	1	Enter 1, if stream morphology data is not available or for intermittent streams
45	Fraction of Critical Low Flow	0	

	B	D	E	F	G	H	J	P	K	L	M	N	O	Q
139						Instream Waste Concentration				Livestock&	Acute	Chronic	Human	Nead
146				Ambient	Effluent	Acute	Domestic	Chronic	Human	Domestic	Irrigation	Wildlife	Aquatic	Aquatic
	POLLUTANTS			Conc	Conc.	Aquatic	Supply	Aquatic	Health	Criteria	Criteria	Criteria	Criteria	Criteria
		CAS No.	MQL	Ca (ug/	Ca (ug/l)	2.13*Ce	d,dom (ug	Cd (ug/l)	Cd,hh (ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
143	Mercury, dissolved	7439-97-6	0.005			0	0	0	0	1E+100	1E+100	1E+100	1.4	0.77
144	Mercury, total	7439-97-6	0.005		0.01	0.0213	0.0213	0.0213	0.020774	2	1E+100	0.77	1E+100	1E+100
	Molybdenum, dissolved	7439-98-7			2.8	5.964	5.964	5.964	5.816741	1E+100	1000	1E+100	1E+100	1E+100
	Molybdenum, total recd	7439-98-7			2.8	5.964	5.964	5.964	5.816741	1E+100	1E+100	1E+100	7920	1895
147	Nickel, dissolved (P)	7440-02-0	0.5		0.380712	0.810916	0.810916	0.810916	0.790894	700	1E+100	1E+100	554.0195	61.53446
148	Selenium, dissolved (P	7782-49-2	5			0	0	0	0	50	130	50	1E+100	1E+100
149	Selenium, dis (SO4 >500 mg/l)		5			0	0	0	0	50	250	50	1E+100	1E+100
150	Selenium, total recover	7782-49-2	5		5.2	11.076	11.076	11.076	10.80252	1E+100	1E+100	5	20	5
151	Silver, dissolved	7440-22-4	0.5		0.060833	0.129575	0.129575	0.129575	0.126376	1E+100	1E+100	1E+100	4.528529	1E+100
152	Thallium, dissolved (P	7440-28-0	0.5			0	0	0	0	2	1E+100	1E+100	1E+100	1E+100
153	Zinc, dissolved	7440-66-6	20		1.464477	3.119336	3.119336	3.119336	3.042316	10500	2000	25000	191.7191	145.2584
154	Cyanide, total recovera	57-12-5	10		13.6	28.968	28.968	28.968	28.25274	200	1E+100	5.2	22	5.2
155	Dioxin	1764-01-6	1E-05			0	0	0	0	3.00E-05	1E+100	1E+100	1E+100	1E+100

	B	D	E	F	G	H	J	P	K	L	M	N	O	Q
278							Livestock	Acute	Chronic	Human	Daily	Monthly	Daily Max	Mon. Avg
279	POLLUTANTS	CAS No.	STORET		Domestic	Irrigation	or Wildlife	Aquatic	Aquatic	Health	Max Conc	Avg Conc	Total	Total
280					Limits	Limits	Limits	Limits	Limits	Limits	ug/l	ug/l	ug/l	ug/l
296	METALS AND CYANIDE, as Total													
297	Antimony, Total (P)	7440-36-0	01097		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
298	Arsenic, Total (P)	7440-38-2	1002		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
299	Beryllium, Total	7440-41-7	01012		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	Cadmium, Total	7440-43-9	01027		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301	Chromium (III), dissolv	16065-83-1	01033		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302	Chromium (VI), dissolv	18540-29-9	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
303	Chromium, Total	7440-47-3	01034		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
304	Copper, Total	7440-50-8	01042		N/A	N/A	N/A	N/A	10.81443	N/A	10.81443	10.81443	28.74432	28.74432
305	Lead, Total	7439-92-1	01051		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
306	Manganese, dissolved	7439-96-5	01056		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
307	Mercury, Total	7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
308	Mercury, Total	7439-97-6	71900		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
309	Molybdenum, dissolved	7439-98-7	1060		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
310	Molybdenum, total recd	7439-98-7	01062		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
311	Nickel, Total (P)	7440-02-0	01067		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
312	Selenium, Total (P)	7782-49-2	01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
313	Selenium, Total (SO4 >500 mg/l)		01147		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
314	Selenium, Total recove	7782-49-2	01147		N/A	N/A	5	N/A	5	N/A	5	5	5	5
315	Silver, Total	7440-22-4	01077		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
316	Thallium, Total (P)	7440-28-0	01059		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
317	Zinc, Total	7440-66-6	1092		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
318	Cyanide, total recovera	57-12-5	00720		N/A	N/A	5.2	22	5.2	N/A	5.2	5.2	5.2	5.2

Note: No limits in draft permit for copper, selenium, cyanide

RP Spreadsheet Using 0.856 ug/L Value for Selenium (Method 7742) and 0.0 ug/L value for Cyanide (as reported in reapplication). No RP for Selenium. No RP for Cyanide.

Ambient Conc Ca (ug/l)	Effluent Conc. Ca (ug/l)
	0.01
	2.8
	2.8
	0.380712
	0.856
	0.060833
	1.464477
	0
O	Q
Daily Max Total ug/l	Mon. Avg Total ug/l
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
28.74432	28.74432
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

Recommend no permit limits for selenium and cyanide

TABLE 6

Outfall 03A160
Original EPA Region 6 Spreadsheet Using 13.6 ug/L Cyanide Value

Permittee	LANL	
NPDES Permit No.	NM0028355	
Outfall No.(s)	03A160	
Plant Effluent Flow (MGD)	0.002	For industrial and federal facility, use the highest monthly average flow
Plant Effluent Flow (cfs)	0.0031	for the past 24 months. For POTWs, use the design flow.
RECEIVING STREAM	DATA INPUT	
Receiving Stream Name	Ten Site Canyon	
Basin Name	Rio Grande	
Waterbody Segment Code No.	20.6.4.128	
Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not)	0	
Are acute aquatic life criteria considered (1= (MUST enter "1" for 2005 Standa	1	
Are chronic aquatic life criteria considered (1= yes, 0=no)	0	
Are domestic water supply criteria considered (1= yes, 0=no)	0	
Are irrigation water supply criteria considered (1= yes, 0=no)	0	
Livestock watering and wildlife habitat criteria applied to all streams		
USGS Flow Station	USGS	
WQ Monitoring Station No.	SJR	
Receiving Stream TSS (mg/l)	1	For intermittent stream, enter effluent TSS
Receiving Stream Hardness (mg/l as $CaCO_3$) RANGE: 0 - 400	118	For intermittent stream, enter effluent Hardness (If no data, 20 mg/l is used)
Receiving Stream Critical Low Flow (4Q3) (cfs)	0	Enter "0" for intermittent stream and lake.
Receiving Stream Harmonic Mean Flow (cfs)	0.00155	Enter harmonic mean or modified harmonic mean flow data
Avg. Water Temperature (C)		
pH (Avg)	8.7	
Fraction of stream allowed for mixing (F)	1	Enter 1, if stream morphology data is not available or for intermittent streams.
Fraction of Critical Low Flow	0	

POLLUTANTS	CAS No.	MQL	Ambient Conc Ca (ug/l)	Effluent Conc. Ce (ug/l)	Instream Waste Concentration: Acute Aquatic 2.13*Ce	Domestic Supply d,dom (ug	Chronic Aquatic Cd (ug/l)	Human Health Cd,hh (ug/l	Livestock& Domestic Criteria ug/l	Acute Irrigation Criteria ug/l	Chronic Wildlife Criteria ug/l	Human Aquatic Criteria ug/l	Need Aquatic Criteria ug/l
Mercury, dissolved	7439-97-6	0.005			0	0	0	0	1E+100	1E+100	1E+100	1.4	0.77
Mercury, total	7439-97-6	0.005		0.0042	0.008946	0.008946	0.008946	0.005964	2	1E+100	0.77	1E+100	1E+100
Molybdenum, dissolve	7439-98-7				0	0	0	0	1E+100	1000	1E+100	1E+100	1E+100
Molybdenum, total rec	7439-98-7				0	0	0	0	1E+100	1E+100	1E+100	7920	1895
Nickel, dissolved (P)	7440-02-0	0.5		0.90604	1.929866	1.929866	1.929866	1.286577	700	1E+100	1E+100	538.6129	59.82327
Selenium, dissolved (	7782-49-2	5			0	0	0	0	50	130	50	1E+100	1E+100
Selenium, dis (SO4 >500 mg/l)		5			0	0	0	0	50	250	50	1E+100	1E+100
Selenium, total recov	7782-49-2	5			0	0	0	0	1E+100	1E+100	5	20	5
Silver, dissolved	7440-22-4	0.5			0	0	0	0	1E+100	1E+100	1E+100	4.276174	1E+100
Thallium, dissolved (I	7440-28-0	0.5			0	0	0	0	2	1E+100	1E+100	1E+100	1E+100
Zinc, dissolved	7440-66-6	20		1.955556	4.165333	4.165333	4.165333	2.776889	10500	2000	25000	185.9941	140.9205
Cyanide, total recove	57-12-5	10		13.6	28.968	28.968	28.968	19.312	200	1E+100	5.2	22	5.2
Dioxin	1764-01-6	0.00001			0	0	0	0	3.00E-05	1E+100	1E+100	1E+100	1E+100

POLLUTANTS	CAS No.	STORET	Domestic Limits	Irrigation Limits	Livestock or Wildlife Limits	Acute Aquatic Limits	Chronic Aquatic Limits	Human Health Limits	Daily Max Conc ug/l	Monthly Avg Conc ug/l	Daily Max Total ug/l	Mon. Avg Total ug/l
METALS AND CYANIDE, as Total												
Antimony, Total (P)	7440-36-0	01097	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic, Total (P)	7440-38-2	1002	N/A	N/A	N/A	N/A	N/A	13.5	13.5	9	19.98	13.32
Beryllium, Total	7440-41-7	01012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium, Total	7440-43-9	01027	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium (III), dissol	16065-83-1	01033	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium (VI), dissol	18540-29-9	01034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium, Total	7440-47-3	01034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copper, Total	7440-50-8	01042	N/A	N/A	N/A	15.70717	N/A	N/A	15.70717	10.47144	32.04262	21.36175
Lead, Total	7439-92-1	01051	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese, dissovled	7439-96-5	01056	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury, Total	7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury, Total	7439-97-6	71900	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum, dissolv	7439-98-7	1060	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum, total rec	7439-98-7	01062	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nickel, Total (P)	7440-02-0	01067	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total (P)	7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total (SO4 >500 mg/l)		01147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium, Total recov	7782-49-2	01147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver, Total	7440-22-4	01077	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium, Total (P)	7440-28-0	01059	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zinc, Total	7440-66-6	1092	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyanide, total recover	57-12-5	00720	N/A	N/A	5.2	22	N/A	N/A	5.2	5.2	5.2	5.2

RP Spreadsheet Using 1.579 ug/L Value for Cyanide (Mgeometric Mean per NMIP). No RP for Cyanide.

POLLUTANTS	Ambient Conc Ca (ug/l)	Effluent Conc. Ce (ug/l)
Mercury, dissolved		
Mercury, total		0.0042
Molybdenum, dissolve		
Molybdenum, total rec		
Nickel, dissolved (P)		0.90604
Selenium, dissolved (		
Selenium, dis (SO4 >500 mg/l)		
Selenium, total recov		
Silver, dissolved		
Thallium, dissolved (I		
Zinc, dissolved		1.955556
Cyanide, total recove		1.579
Dioxin		

POLLUTANTS	Daily Max Total ug/l	Mon. Avg Total ug/l
Antimony, Total (P)	N/A	N/A
Arsenic, Total (P)	19.98	13.32
Beryllium, Total	N/A	N/A
Cadmium, Total	N/A	N/A
Chromium (III), dissol	N/A	N/A
Chromium (VI), dissol	N/A	N/A
Chromium, Total	N/A	N/A
Copper, Total	32.04262	21.36175
Lead, Total	N/A	N/A
Manganese, dissovled	N/A	N/A
Mercury, Total	N/A	N/A
Mercury, Total	N/A	N/A
Molybdenum, dissolv	N/A	N/A
Molybdenum, total rec	N/A	N/A
Nickel, Total (P)	N/A	N/A
Selenium, Total (P)	N/A	N/A
Selenium, Total (SO4 >500 mg/l)	N/A	N/A
Selenium, Total recov	N/A	N/A
Silver, Total	N/A	N/A
Thallium, Total (P)	N/A	N/A
Zinc, Total	N/A	N/A
Cyanide, total recover	N/A	N/A

Recommend no permit limit for cyanide

EXHIBIT
PP

Article outline Show full outline

Highlights
Abstract
Abbreviations
Keywords
1. Introduction
2. Methods
3. Results and discussion
4. Conclusions
Acknowledgments
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Figures and tables

ec0005
Supplementary Fig. 1
Supplementary Fig. 2
Supplementary Fig. 3
Supplementary Fig. 4

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Isotopic evidence for reduction of anthropogenic hexavalent chromium in Los Alamos National Laboratory groundwater

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Highlights

- Study using Cr isotopes in groundwater to characterize contaminant attenuation
- Cr isotopes indicate chromate reduction between surface and regional groundwater
- Chromate reduction is most strongly associated with basalts.

Abstract

Reduction of toxic Cr(VI) to less toxic Cr(III) is an important process for attenuating Cr(VI) transport in groundwater. This process results in immobilization of chromium as Cr(III) and effectively decreases the overall mobility of the chromium inventory. During both abiotic and biotic reduction of Cr(VI) to Cr(III), a kinetic isotope effect occurs in which the lighter isotope, ^{52}Cr, reacts preferentially, leaving the remaining dissolved Cr(VI) enriched in the heavier isotope, ^{53}Cr. Cr isotopes have proven to be a useful tool for estimating the magnitude of Cr(VI) reduction and for determining where in a hydrologic system reduction is occurring. In this paper, we discuss patterns of reduction in perched-intermediate and regional aquifer systems contaminated with Cr(VI) related to historical use of potassium dichromate as an anticorrosion agent in cooling towers at a power plant at the Los Alamos National Laboratory in northern New Mexico. We utilize Cr isotopes to assess the relative effects of mixing and reduction on measured $\delta^{53}Cr$ in groundwater, with an emphasis on where in the system reduction occurs. Chromium isotope measurements provide strong evidence for reduction of Cr(VI) in vadose zone basalts.

Abbreviations

LANL, Los Alamos National Laboratory; RLWTF, Radioactive Liquid Waste Treatment Facility; TA, Technical Area

Keywords

Chromium; Contamination; Chromium isotopes; Reduction; Groundwater

1. Introduction

Reduction of toxic Cr(VI) to less toxic Cr(III) is an important process for attenuating Cr(VI) transport in groundwater (Eary and Rai, 1989, Palmer and Wittbrodt, 1991, Palmer and Puls, 1994 and Davis and Olsen, 1995). This process results in immobilization of chromium as Cr(III) and effectively decreases the overall mobility of the chromium inventory. Cr isotopes have proven to be a useful tool for estimating the magnitude of Cr(VI) reduction and for determining where in a hydrologic system reduction is occurring (Blowes, 2002, Ellis et al., 2002, Izbicki et al., 2008, Izbicki et al., 2012, Berna et al., 2010, Gao et al., 2010, Raddatz et al., 2011, Wanner et al., 2012a and Wanner et al., 2012b).

The use of Cr isotopes to estimate the magnitude of Cr(VI) reduction along a flow path relies on the fact that during both abiotic and biotic reduction of Cr(VI) to Cr(III), a kinetic isotope effect occurs in which the lighter isotope, ^{52}Cr, reacts preferentially, leaving the remaining dissolved Cr(VI) enriched in the heavier isotope, ^{53}Cr (e.g. Ellis et al., 2002, Johnson and Bullen, 2004, Izbicki et al., 2008, Berna et al., 2010 and Jamieson-Hanes et al., 2012b). The most common model used to determine the extent of reduction based on the $\delta^{53}Cr$ of Cr(VI) is the Rayleigh model (Ellis et al., 2002, Berna et al., 2010, Zink et al., 2010, Dossing et al., 2011 and Raddatz et al., 2011) that can be closely approximated as

$$\delta=\delta_0-\varepsilon\ln(f) \quad (1)$$

Turn on

(see Supplementary Information for an explanation of delta notation)where δ is the measured $\delta^{53}Cr$ value, δ_0 is the initial $\delta^{53}Cr$ value prior to any reduction, f is the fraction of the original Cr(VI) remaining, and ε expresses the magnitude of isotopic fractionation (Raddatz et al., 2011). ε can be expressed in per mil form and approximated as

$$\varepsilon=\delta^{53}Cr_{reactant}-\delta^{53}Cr_{product}. \quad (2)$$

Application of the Rayleigh model to determine the magnitude of Cr(VI) reduction can be considered semi-quantitative as a range of experimental ε values has been determined in laboratory experiments using inorganic and organic reductants and biotic and abiotic reduction mechanisms. The range of Cr isotopic fractionation determined in batch and column experiments is ε = 0.4 to 5‰ (Ellis et al., 2002, Sikora et al., 2008, Berna et al., 2010, Zink et al., 2010, Dossing et al., 2011, Basu and Johnson, 2012, Han et al., 2012, Jamieson-Hanes et al., 2012b and Kitchen et al., 2012). Fractionation tends to be smaller in cases of rapid Cr(VI) reduction (Kitchen et al., 2012), anaerobic microbial reduction (Sikora et al., 2008), reduction during porous flow (in column studies) (Jamieson-Hanes et al., 2012a and Jamieson-Hanes et al., 2012b), and when there is addition of fresh reductant at constant mass flux (Dossing et al., 2011). Additionally, ε values determined based on field experiments tend to fall on the lower end of the observed range of laboratory-derived values (Berna et al., 2010, Izbicki et al., 2012 and Wanner et al., 2012a). If actual aquifer fractionation is lower than assumed by applying Eq. (1), the degree of reduction will be underestimated. Since the particular reduction mechanism and associated ε value are typically unknown for a given groundwater setting, there is considerable uncertainty in estimation of the magnitude of reduction (Jamieson-Hanes et al., 2012a and Jamieson-Hanes et al., 2012b). Cr isotope measurements, however, still provide important bounds on the degree of natural reduction in groundwater systems, including where in the system reduction is most prevalent.

Chromium isotopic fractionation does not appear to vary with Cr(VI) concentration, at least in the case of microbial reduction (Sikora et al., 2008). In addition, there does not appear to be isotopic exchange between Cr(III) and Cr(VI) on short timescales of days to weeks (Zink et al., 2010). Also, Cr isotopes are not fractionated significantly by sorption processes (Ellis et al., 2004).

In some settings, mixing of natural and anthropogenic Cr(VI) must be considered (e.g. Raddatz et al., 2011). Recent work suggests that water–rock interactions during weathering of mafic rocks result in the production of natural Cr(VI) with elevated $\delta^{53}Cr$ (Izbicki et al., 2008). Alternatively, elevation of $\delta^{53}Cr$ in naturally-sourced dissolved Cr(VI) can occur after Cr(VI) "is delivered to the water, via partial reduction by Fe(II)-bearing solids or bacteria" (Raddatz et al., 2011). Chromite ores, from which industrial Cr is derived, have an average $\delta^{53}Cr$ of -0.082 ± 0.058‰ (2 σ) (Schoenberg et al., 2008). Because of the high temperature and efficiency of Cr extraction from ore, industrial Cr should have very similar $\delta^{53}Cr$ values to chromite ore (Ellis et al., 2002 and Schoenberg

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et al., 2008). The highest value measured in industrial reagent Cr was 0.37‰ (Ellis et al., 2002). Uncertainty in the $\delta^{53}Cr$ of the industrial source adds further uncertainty in calculating the degree of Cr(VI) reduction occurring along a flow path.

At present, only a small number of case studies have been published to describe application of Cr isotopes in practical field studies. Herein, we discuss patterns of reduction in perched-intermediate and regional aquifer systems contaminated with Cr (VI) related to historical use of potassium dichromate as an anticorrosion agent in cooling towers at a power plant at the Los Alamos National Laboratory (LANL) in northern New Mexico. Potassium dichromate was a common industrial corrosion inhibitor when it was used at LANL. The subsurface stratigraphy in this setting includes basalts with Fe(II)-bearing minerals and other rock types where natural attenuation via reduction of Cr(VI) may occur. Cr(VI) reduction in basalts at the Idaho National Laboratory has been suggested based on evidence from Cr isotopes (Raddatz et al., 2011). Natural Cr(VI) occurs in groundwater at the LANL site (Dale et al., 2013), so the effect of mixing between natural and anthropogenic sources must be considered. We apply the approach utilized by Raddatz et al. (2011) to assess the relative effects of mixing and reduction on measured $\delta^{53}Cr$ in LANL groundwater, with an emphasis on where in the system reduction occurs.

1.1. Discharge of hexavalent chromium and other contaminants

Fig. 1 shows the location of liquid outfalls relevant to this investigation. Liquid effluents have been discharged to Sandia Canyon since the early 1950s at Outfall 001. The highest volume releases include treated sanitary wastewater, steam plant effluent, and cooling tower blowdown from the LANL Technical Area 3 (TA-03) power plant. Potassium dichromate was used from 1956 to 1972, and resulted in an estimated total release of 31,000 to 72,000 kg of Cr(VI) into upper Sandia Canyon. Outfall discharge during this period is estimated at 0.4 to 1.1 million liters per day. Recent outfall discharge to upper Sandia Canyon is approximately 0.8 to 1.5 million liters per day, providing sufficient water to mobilize contaminants within the watershed (LANL, 2009 and LANL, 2012).

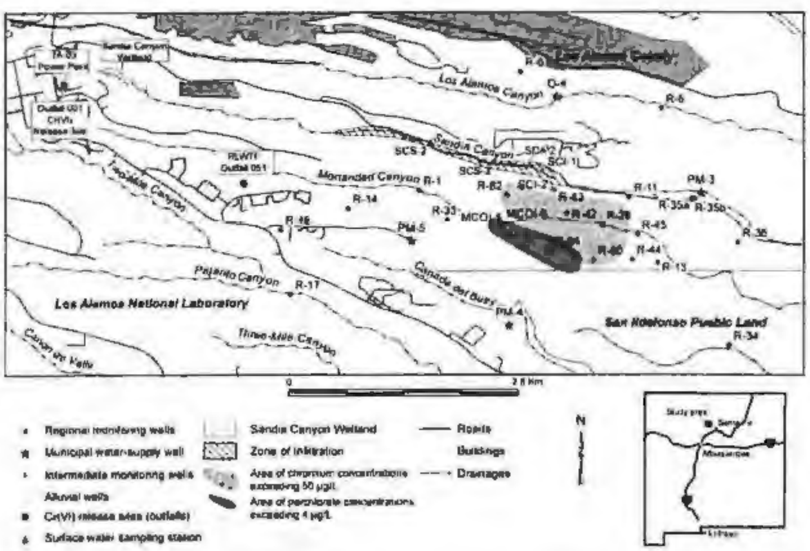

Fig. 1.
Location map showing outfalls, the Sandia Canyon wetland, the primary Cr(VI) infiltration zone, locations of monitoring wells, the area of Cr(VI) concentration exceeding 50 μg/L in the regional aquifer, and the area of perchlorate concentration exceeding 4 μg/L in the regional aquifer. Wells R-10 and R-10a are off the map to the east, outside the area of influence of the Cr plume.

Figure options

Contaminant discharges to Mortandad Canyon, located to the south of Sandia Canyon (Fig. 1), are also relevant to this investigation due to the potential for mixing with waters originating in Sandia Canyon. Water treatment at LANL's Radioactive Liquid Waste Treatment Facility (RLWTF) began in July 1963. The RLWTF discharged treated wastewater containing perchlorate, nitrate and tritium, but not Cr(VI), to Mortandad Canyon through Outfall 051 via a tributary called Effluent Canyon. However, a smaller chromium source (based on the occurrence of Cr(III) in sediments) of unknown provenance also occurs in Effluent Canyon upgradient from Outfall 051. Outfall 051 has historically released much lower volumes of effluent than Outfall 001 with peak discharges of 0.2 million liters per day occurring in 1968. Discharges from Outfall 051 decreased significantly after the mid-1980s and effectively ended in late 2010 (LANL, 2009 and LANL, 2012).

1.2. Conceptual model for chromium transport

This section is summarized from recent regulatory reports submitted to the New Mexico Environment Department (LANL, 2009 and LANL, 2012; reports are publicly available (see http://www.lanl.gov/community-environment/environmental-stewardship/public-reading-room.php); see also Birdsell et al. (2005) and Vesselinov et al. (2013)). LANL groundwater data may be accessed online at www.intellusnm.com.

A significant portion of the Cr(VI) released from Outfall 001 to Sandia Canyon was immobilized as Cr(III) in a wetland present in the upper part of Sandia Canyon (Fig. 1). The estimated total inventory of contaminant chromium in sediment deposits in Sandia Canyon is 18,000 kg, with measured concentrations ranging from 5.6 mg/kg to 3740 mg/kg (LANL, 2007). Approximately eighty-five percent of this total is concentrated in sediments within the Sandia Canyon wetland. Chromium in wetland sediments is nearly 100% Cr(III) based on paired analyses of total Cr and Cr(VI) (LANL, 2007).

A water balance study in Sandia Canyon showed that most surface water passes through the wetland area, with less than 2% of the water lost to evapotranspiration and infiltration (LANL, 2009). After exiting the wetland, surface water flows without loss approximately 0.85 km down a narrow slot canyon underlain by relatively impermeable welded tuff with little or no alluvial sediments. About 20% of the surface water infiltrates the canyon floor between 0.85 and 3.6 km east of the wetland. Approximately 60% infiltrates 3.6 to 4.5 km east of the wetland where the canyon gradually widens and alluvial deposits become about 20 m thick. The infiltrated surface water forms a perched alluvial groundwater system that extends down canyon approximately 2.2 km (Fig. 1, Supplementary Fig. 1). The alluvial groundwater drains into the suballuvial bedrock tuffs that are poorly welded and more porous in this part of the canyon. Flow into the suballuvial bedrock is spatially and temporally heterogeneous with percolation rates potentially as high as a few meters per year, resulting in travel times to the regional aquifer from 5 to 50 years with best estimates ranging between 20 to 30 years. Deeper percolation of alluvial groundwater as unsaturated flow provides a driving force for subsurface transport of mobile constituents, including Cr(VI).

From the alluvial zone, water percolates down through the vadose zone, consisting of Bandelier Tuff Formation volcanic rocks and Puye Formation sediments, where perching horizons on top of and within Cerros del Rio basalts cause some water to move laterally (Supplementary Fig. 1; For a detailed description of site geology see Broxton and Vaniman, 2005). The perching horizons in these basalts dip towards the south and southwest causing the perched-intermediate groundwater to flow toward Mortandad Canyon. Percolation through the basalts is expected to be dominated by unsaturated flow through fractured matrix and interflow breccias. Leakage from the perched zones occurs as water flows laterally, and contaminants migrate downward toward the regional aquifer. Percolation in the lower vadose zone is probably dominated by gravity-driven flow through highly porous sediments of the lower Puye Formation and underlying older Miocene-age pumiceous deposits.

Chromium released into Sandia Canyon in the mid-1950s through early 1970s has migrated along these pathways and is observed in the regional aquifer beneath Sandia Canyon and Mortandad Canyon at concentrations that exceed the New Mexico groundwater standard of 50 μg/L (Fig. 2). The zone of contamination is confined to the upper portions of the regional aquifer. Contaminant transport in the regional aquifer is believed to predominantly follow shallow water table gradients with relatively poor hydraulic communication with deeper aquifer zones, though this does not preclude some migration of Cr(VI) between zones (Vesselinov et al., 2013).

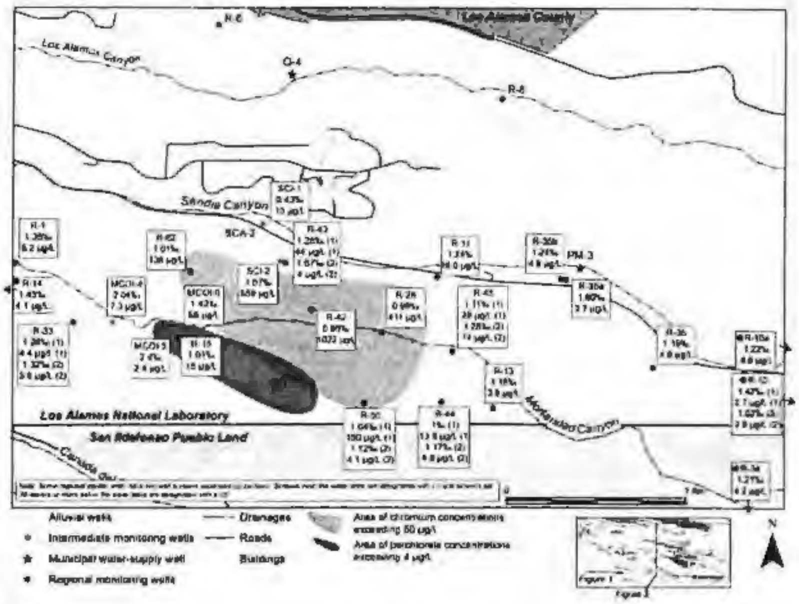

Fig. 2.

Most recent $\delta^{53}Cr$ and Cr(VI) concentrations for perched-intermediate and regional aquifer wells in Sandia Canyon and Mortandad Canyon (sample dates from 2008–2012). Where two values are given for each parameter, those followed by (1) are from the upper screen and those followed by (2) from the lower screen of the particular well (see Supplementary Table 1 for screen depths). Text boxes shaded in yellow represent wells outside the Cr plume that have only natural background chromate present. The pink-shaded plume represents the area of the regional groundwater system where Cr(VI) concentrations are above the New Mexico groundwater standard of 50 µg/L. The gray-shaded plume represents the area of the regional groundwater system where perchlorate concentrations are above a New Mexico screening level of 4 µg/L.

Figure options

Data from groundwater monitoring wells reveals the presence of two geochemically distinct groundwater plumes, one derived from a Sandia Canyon source (with elevated chromium as a key indicator) and one derived from a Mortandad Canyon source (with elevated perchlorate as a key indicator) (Fig. 1). Mixing of these plumes occurs in perched-intermediate (110–210 meter depth) and regional groundwater (260–380 meter depth) beneath and to the south of Mortandad Canyon. For example, perched-intermediate wells MCOI-4, MCOI-5 and MCOI-6 located in Mortandad Canyon (Fig. 2) all contain perchlorate, nitrate, and tritium, contaminants released by the RLWTF at Outfall 051. However, well MCOI-6 contains elevated chromium in addition to the RLWTF contaminants, indicating that it is recharged by water originating from both Sandia and Mortandad Canyons. Recent declines in water levels at well MCOI-6 correspond with declining perchlorate, nitrate, and tritium concentrations. However, Cr concentrations have simultaneously increased, likely reflecting improved water quality and lower effluent volumes from Outfall 051 (Mortandad Canyon) resulting in a subsequent increase in the fraction of Sandia Canyon derived water. The observed trends support the conceptual model of perched-intermediate groundwater flow to the south and southwest from Sandia Canyon towards Mortandad Canyon.

Geochemical indicators also link perched-intermediate groundwater at well SCI-2 in Sandia Canyon to regional groundwater at wells R-28, R-42 and R-50 in Mortandad Canyon, which are in the centroid of the Cr plume as defined by the 50 µg/L-contour (Fig. 2). Concentrations indicate that Cr enters the regional aquifer near wells R-42 and R-28 (Vesselinov et al., 2013). A simplified hypothetical subsurface flow path for Cr(VI) contamination, therefore, includes vertical flow from perched alluvial groundwater in Sandia Canyon to perched-intermediate groundwater on top of (e.g. at well SCI-1) and within (e.g. at well SCI-2) the Cerros del Rio basalts, and south to southwest lateral flow of perched-intermediate groundwater before it drops to the regional aquifer near wells R-42 and R-28. In reality, there are likely multiple flow paths and arrival points to the regional aquifer (Vesselinov et al., 2013) and perhaps mixing with secondary, less significant, Cr(VI) from a Mortandad Canyon source.

2. Methods

Groundwater samples were collected at perched-intermediate and regional monitoring wells (Fig. 2) in 1-L high-density polypropylene bottles. Before November 2008, the non-acidified samples were filtered through 0.45-micrometer membranes. During the course of this investigation, it was recognized that, for some samples, colloidal Cr(III) passed through 0.45 and 0.22-micrometer membranes. Even though colloidal Cr(III) appears to have no measurable effect on δ^{53}Cr of Cr(VI) (LANL, 2009), samples collected since November 2008 have been filtered through 0.02-micrometer membranes.

All samples were analyzed for Cr isotope ratios and concentrations on a Nu Plasma HR MC-ICP-MS (multicollector inductively coupled plasma mass spectrometer) at the University of Illinois-Urbana Champaign using a ^{54}Cr/^{50}Cr double isotope spike technique (Ellis et al., 2002, Johnson and Bullen, 2004 and Schoenberg et al., 2008). For a detailed description of sample preparation and analytical techniques see Raddatz et al (2011). The absolute difference between duplicate pairs of field samples was always below 0.2‰, except for one sample from well R-35a where the difference in duplicates was 0.23‰. Two times the root-mean-square difference for 16 pairs of duplicate samples was ± 0.13‰ (95% confidence). Cr(VI) concentrations were determined by isotope dilution against the double spike solution. The ^{54}Cr concentration of the double spike is calibrated, and the volumes of the sample and the added spike are measured precisely. The measured ^{54}Cr/^{52}Cr ratio, corrected for mass bias, provides a precise indication of sample concentration relative to spike concentration, using standard isotope dilution calculations.

No samples of the potassium dichromate used in the TA-03 cooling tower were available for analysis. Potassium dichromate solutions used by Jamieson-Hanes et al. (2012b) in batch and column experiments were close to 0‰. Here we assume a value of 0‰ for δ_0 of contaminant Cr(VI), consistent with measurements of industrial chromate solutions (Ellis et al., 2002 and Schoenberg et al., 2008).

3. Results and discussion

Values for δ^{53}Cr and Cr(VI) concentrations of groundwater samples are presented in Supplementary Table 1 of the Supplementary information. Well locations are provided in Supplementary Table 2. Spatial variability in results is shown in Fig. 2. Because the wells sampled were installed over many years, data from the most recent sampling events are shown in Fig. 2 (as opposed to averages). For the majority of wells, particularly those completed in the regional aquifer, δ^{53}Cr is relatively consistent over time (Supplementary Table 1). Notable exceptions include the shallow screen at regional aquifer well R-43 and both screens at regional aquifer well R-45, which are discussed in more detail in Section 3.4. Intermediate well MCOI-6 also shows isotopic variation through time, although insufficient isotopic data exist to evaluate trends. All three of these wells are located at the margin of the plume where dynamic geochemical behavior is expected.

3.1. Potential locations for reduction of Cr(VI)

From a remediation standpoint, it is desirable to know where in the system natural attenuation of chromate is occurring. The primary locations where Cr(VI) may be reduced to Cr(III) include 1) the cooling towers (which could affect the δ^{53}Cr signal of Cr(VI) input into the natural environment), 2) the Sandia Canyon wetland, 3) the vadose zone, and 4) the regional aquifer.

The degree of Cr isotopic fractionation associated with the use of chromate in cooling towers as a corrosion inhibitor is expected to be limited due to the constant replenishment of Cr(VI) necessitated by constant losses of cooling water. Thus the δ^{53}Cr of Cr(VI) associated with cooling water outflow is expected to be near zero.

Cr(VI) reduction is prevalent in the Sandia Canyon wetland where the current inventory of Cr(III) is estimated at 15,000 kg (LANL, 2007). In our preferred conceptual model we assume that all Cr(VI) interacting with wetland sediments is reduced to Cr(III), leaving no or only minor residual Cr(VI) with a higher $\delta^{53}Cr$ signature. Contaminant Cr(VI) detected further down the flow path is likely derived from fast-moving surface water that did not interact with wetland sediments. This Cr(VI) would have an isotopic composition similar to that of the cooling tower discharge.

Cr(VI) reduction in the vadose zone is favored by the presence of Fe(II)-bearing minerals (Eary and Rai, 1989, Pettine et al., 1998 and Raddatz et al., 2011). Total iron concentrations (Fe speciation measurements have not been performed) and mineralogy for stratigraphic units present in the vadose zone and the regional aquifer are shown in Supplementary Fig. 2. The Cerros del Rio basalts have the greatest potential to reduce Cr(VI) to Cr(III) because of the abundance of Fe(II)-bearing minerals such as olivine, pyroxene, and magnetite. When Fe(II) is oxidized to Fe(III), Cr(VI) can be simultaneously reduced to Cr(III). Fe(II)-bearing minerals and glass in Cerros del Rio basalts and in dacitic lithologies of the Puye Formation provide significant reducing potential (cf. Raddatz et al., 2011). Evidence for reduction in vadose zone stratigraphic units, particularly in the Cerros del Rio basalts is shown in Supplementary Fig. 3 (See Supplementary information for discussion). Regional aquifer sediments also contain Fe(II)-bearing minerals (mostly pyroxenes) capable of reducing Cr(VI) to Cr(III) (Supplementary Fig. 2), and the possibility of regional aquifer reduction is suggested by the modeling results of Vesselinov et al. (2013).

It is often assumed that reduction occurs at dissolved oxygen levels of less than 6 ppm, although it can also occur in reducing microenvironments within oxidizing settings or through the metabolic activity of aerobic microbes (Desjardin et al., 2002, Horton et al., 2006 and Raddatz et al., 2011). Reduction by Fe(II) can occur in the presence of dissolved oxygen (Eary and Rai, 1989). In the samples analyzed, dissolved oxygen ranged from ~ 2 mg/L to 10 mg/L.

We postulate that Cr isotopes can be used to understand where in the hydrologic system Cr(VI) reduction occurs. We address this question by evaluating the spatial relationships for Cr(VI) data in 3.2, 3.3, 3.4 and 3.5.

3.2. Background intermediate and regional wells

Wells with background levels of Cr(VI) were identified based on their location relative to the main plume, distribution of plume co-contaminants, and flow and transport considerations. Background wells have Cr(VI) concentrations less than 6 μg/L and $\delta^{53}Cr$ values in the range of 1.2‰–1.9‰ (Fig. 2). These values are similar to those detected at background locations associated with basalts at Idaho National Laboratory (Raddatz et al., 2011) and in the recharge areas of flow paths in alluvial aquifers associated with ultramafic rocks in the western Mojave Desert (Izbicki et al., 2008). Cr mobilized by weathering of tonalitic bedrock in Madagascar also has positive $\delta^{53}Cr$ (Berger and Frei, 2014). Natural background Cr(VI) in LANL groundwater has a higher $\delta^{53}Cr$ signature than industrial chromate sources ($\delta^{53}Cr$ industrial approximately equal to 0‰; Ellis et al., 2002 and Schoenberg et al., 2008), probably as the result of fractionation that occurs during oxidation of Cr(III) to Cr(IV) via water–rock interactions. The deep screens at all dual-screened wells, with the exception of well R-45, have Cr(VI) concentrations and $\delta^{53}Cr$ in the background range, indicating contamination is generally restricted to the uppermost part of the regional aquifer.

3.3. Perched-intermediate wells

Intermediate wells SCI-1 and MCOI-4 are completed in groundwater perched in sedimentary deposits of the Puye Formation above the Cerros del Rio basalts (Supplementary Fig. 1). All other perched-intermediate wells are completed within the basalts, and regional wells are completed in the underlying sedimentary units (Puye Formation or Miocene-age pumiceous sediments) (Supplementary Fig. 1). Well SCI-1 is located along the infiltration pathway from the primary Cr(VI) source associated with Sandia Canyon (Fig. 1). Chromium isotope results from this well are key to understanding where in the hydrologic system reduction occurs. Based on contaminant concentrations, groundwater in well SCI-1 is largely post-1990 in age, thus post-dating the cessation of Cr(VI) discharges (LANL, 2012). Cr(VI) concentrations present at well SCI-1 consist of vadose-zone Cr that probably represents the tail of the plume. Cr/SO_4 ratios along the primary infiltration pathway are consistent with this interpretation (Supplementary Fig. 4; See Supplementary information for discussion).

Well SCI-1 has the lowest $\delta^{53}Cr$ values observed in this study (0.3‰–0.5‰), suggesting little reduction along the flow pathway to this well. As Cr(VI) in this location represents the tail end of the Cr plume, several conclusions can be drawn: 1) $\delta^{53}Cr$ of the potassium dichromate used in the TA-3 cooling tower was likely approximately zero per mil, consistent with measurements of other industrial Cr sources, 2) whereas Cr(VI) reduction and isotopic fractionation no doubt occurred in the TA-3 cooling tower and in the Sandia Canyon wetland, this fractionation did not lead to significant increases in $\delta^{53}Cr$ in residual Cr(VI) for reasons discussed in Sections 3.1, and 3) only minor reduction is likely to have occurred in the overlying Bandelier Tuff. The distribution of total iron, Fe(II)-bearing minerals and the inferred distribution of Cr(III) in the vadose zone are consistent with minor reduction along the flow path above the Cerros del Rio basalts, with most reduction occurring within and possibly below the basalts (See discussion in Supplementary information and Supplementary Fig. 2 and Supplementary Fig. 3).

Perched-intermediate well MCOI-4 is located along the same perching horizon as well SCI-1 but has a different geochemical signature (LANL, 2012). Water from well MCOI-4 has some of the highest $\delta^{53}Cr$ values observed in this study, and Cr(VI) concentrations slightly above background. These concentrations may be the result of lateral transport from Sandia Canyon along a slow pathway that allowed for significant reduction. Alternatively, the Cr(VI) may be partially derived from the unidentified chromium source located in Effluent Canyon with a flow and transport history quite different from the wells associated with the main plume. Regardless of the source, significant reduction of Cr(VI) is suggested by the higher observed $\delta^{53}Cr$.

Perched-intermediate well MCOI-5 is also likely associated, at least in part, with a Mortandad Canyon source of Cr(VI). MCOI-5 has the highest recent $\delta^{53}Cr$ (2.4‰) and lowest Cr(VI) concentration (2.4 μg/L) of the wells included in this study. This well is completed in basalt, which would provide the reduction potential necessary to produce the observed heavy $\delta^{53}Cr$ and low Cr concentration (Raddatz et al., 2011). Wells SCI-2 and MCOI-6 are also completed in basalt but contain a higher proportion of water from Sandia Canyon. Mixing of plumes could confuse interpretation of $\delta^{53}Cr$ signatures by averaging out the degree of reduction that has occurred from different sources and along different flow paths.

The isotopic composition of industrial chromate sources is unlikely to differ between Mortandad Canyon and Sandia Canyon Therefore, the isotopic variation observed in intermediate wells SCI-2, MCOI-6, MCOI-4, and MCOI-5 is likely a function of their position along the overall Cr transport pathway. Well SCI-2 is near the centroid of the Sandia Canyon plume where the velocity of groundwater flow (residence time), the kinetics of reduction, and the reducing capacity of the basalts only favor modest increases in $\delta^{53}Cr$. The other intermediate wells are closer to plume margins where more extensive reduction of Cr(VI), with associated increases in $\delta^{53}Cr$, is likely to occur due to higher availability of Fe(II) reductants (relative to Cr(VI) concentrations) and lengthier transport pathways. Isotopic fractionation caused by sorption may be responsible for small $\delta^{53}Cr$ shifts in some vadose zone samples near the plume boundary. Ellis et al. (2004) found that equilibrium sorption has very little effect on $^{53}Cr/^{52}Cr$ ratios; the effect was not detected at a precision of ± 0.04‰. However, they also reported that small sorption-related $^{53}Cr/^{52}Cr$ shifts could be magnified by up to a factor of ten at the leading edges of advancing Cr(VI) plumes. Accordingly, there is some chance that $\delta^{53}Cr$ values in plume edge vadose zone samples are significantly affected by this phenomenon. However, the actual magnitude and direction of sorption effects are not known, and thus we cannot assess the impact of sorption at present. It should be noted that the chromium plume is very heterogeneous in the vadose zone and it is unknown which wells, if any, are truly at the leading edge of an advancing plume where sorption-related effects may be relevant.

3.4. Regional aquifer wells

Most of the regional aquifer wells showing evidence of Cr(VI) contamination have $\delta^{53}Cr$ values that fall in a narrow range, close to 1‰ (Fig. 2). Fig. 3 shows the processes that can affect Cr(VI) concentration and $\delta^{53}Cr$ values, including reduction, mixing with background waters, and sorption. In the figure, the processes act upon a hypothetical high Cr(VI) concentration end member that has not undergone substantial reduction in the vadose zone or regional aquifer. Reduction and mixing in the vadose zone and regional aquifer can increase the $\delta^{53}Cr$ value while decreasing the Cr(VI) concentration relative to the original end member. Sorption does not change $\delta^{53}Cr$ (except perhaps on the very fringes of a plume; see Section 3.3) but decreases the Cr(VI) concentration. Mixing with background waters and reduction are the likely mechanisms that lead to the observed $\delta^{53}Cr$ values close to unity within the area of highest Cr(VI) contamination.

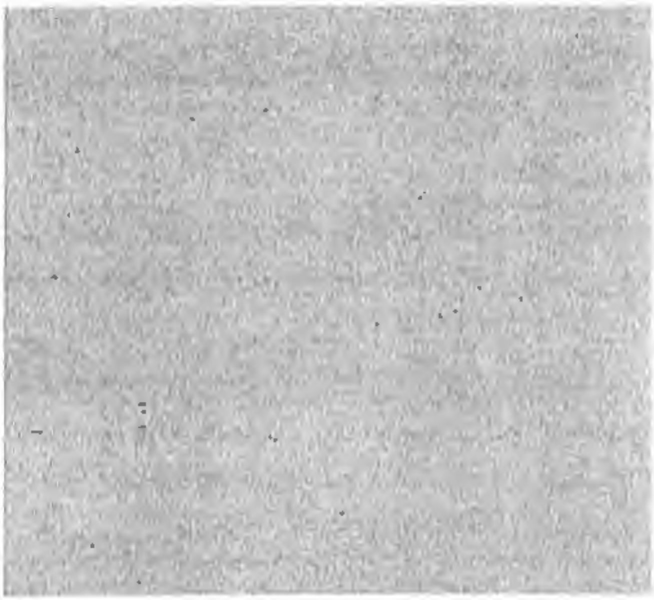

Fig. 3.
$\delta^{53}Cr$ versus Cr(VI) concentration for most recent data from each well. Lower blue curve is a mixing line between a background water and a highly Cr(VI)-contaminated water (open orange box; estimated from the Cr[VI] concentration and $\delta^{53}Cr$ at well R-42; see text for explanation) that has not undergone substantial reduction in the vadose zone or regional aquifer. Upper curve is a mixing line between well R-42 (shows isotopic evidence for Cr(VI) reduction) and background. The isotopic trend associated with reduction for $\varepsilon = 3.4$‰ is shown, along with fraction Cr(VI) remaining as reduction proceeds. The value of 3.4‰ was chosen to be intermediate within the range of experimentally observed fractionation factors. The lack of isotopic fractionation associated with sorption is also shown. Labeled panels with numbers 1, 2, and 3 show expected trends in both $\delta^{53}Cr$ and Cr(VI) concentration for processes of reduction, mixing, and sorption, respectively. These processes likely occur concurrently, at least to some degree. Not all data points are labeled to prevent cluttering of the diagram.

Figure options

A hypothetical high Cr(VI) concentration end member impacting the subsurface was assumed to have an isotopic composition similar to that of well SCI-1 (i.e. $\delta^{53}Cr$ representing an industrial chromate source, possibly with minor isotopic enrichment from reduction in the upgradient cooling tower and wetland). As well R-42 shows the least evidence for reduction in the vadose zone, the isotopic composition and concentration of Cr(VI) in this well were used to estimate the concentration of Cr(VI) entering the perched intermediate aquifer at locations such as well SCI-1. Using δ_0 from well SCI-1 and δ from well R-42, Eq. (1) was used to calculate f, the fraction of Cr(VI) remaining after reduction along the flow path to well R-42. The value of f was then used to estimate the initial concentration of Cr(VI). This calculation ignores the minor effect of mixing with background Cr(VI). While sufficient to illustrate the processes governing observed Cr isotopic variation, the hypothetical end-member, and associated reduction trend, is shown as an example only. Given the spatial and temporal heterogeneity in infiltration and flow pathways and discharge concentrations, the flow path to any individual location could have experienced lower or higher initial Cr(VI) inputs.

It is clear that reduction occurred somewhere along the individual flow paths in all contaminated wells with the possible exception of well SCI-1 (process 1 in Fig. 3). (It is important to note that Cr isotope measurements do not imply reduction has occurred at the location being sampled but rather somewhere along the flow path to that location.) Except for samples from the deep well screens, the Cr data from all wells in the contaminant plume plot above the mixing line defined by the hypothetical high Cr(VI) source that has not undergone reduction and the regional groundwater background location with the highest $\delta^{53}Cr$. All such waters must have experienced some degree of Cr(VI) reduction as these data cannot be explained by mixing alone (the lower curve in Fig. 3) (cf. Raddatz et al., 2011). It is also clear from comparison of results with the perched-intermediate wells that some of the reduction has occurred in the Cerros del Rio basalts, consistent with the presence of abundant iron(II)-bearing minerals, and potentially in the overlying Puye Formation in the case of well MCOI-4. As Fe(II)-bearing minerals occur in all stratigraphic units, reduction in other units, including the regional aquifer, is also possible. In addition, it is apparent that although background concentrations are low, mixing with background Cr(VI) could explain much of the observed Cr isotope variation. Many of the points fall along the upper mixing line between well R-42 (where evidence for reduction is seen) and the regional groundwater background end-member (process 2 in Fig. 3). Waters at these locations have likely experienced a combination of reduction and mixing with background Cr(VI). Regional aquifer wells near the centroid of mass (e.g., R-28, R-42, and the shallow screen at well R-50) are less affected by mixing with background than wells closer to the periphery of the plume. While an ε value of 3.4‰ is used for illustration purposes in Fig. 3, it should be noted that lower ε effective values may be more representative of field conditions (Berna et al., 2010, Jamieson-Hanes et al., 2012a and Jamieson-Hanes et al., 2012b).

Time series data from the shallow screen at well R-43 are also informative. Increasing Cr(VI) concentration trends with initially decreasing $\delta^{53}Cr$ values are consistent with a recent arrival of the Cr(VI) plume at this location (Fig. 4). As concentrations increase, more contaminant Cr(VI) with a lower $\delta^{53}Cr$ signature relative to background Cr(VI) is present (Fig. 4). Similar trends of decreasing $\delta^{53}Cr$ with increasing Cr(VI) concentration are seen in both screens of well R-45, consistent with plume arrival at this location (Fig. 5). As stated in Section 3.3, the effect of sorption at the plume periphery on observed $\delta^{53}Cr$ is unknown.

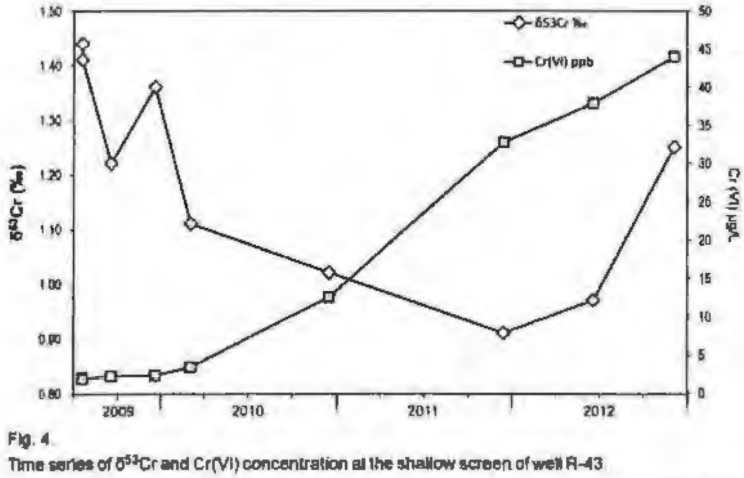

Fig. 4.
Time series of $\delta^{53}Cr$ and Cr(VI) concentration at the shallow screen of well R-43.

Figure options

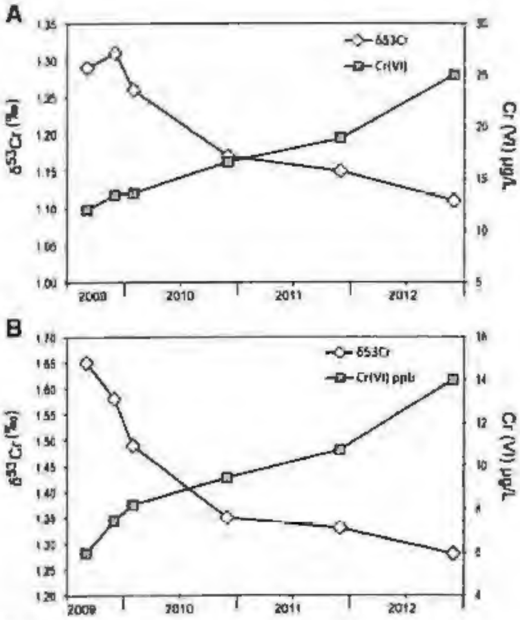

Fig. 5.
Time series of $\delta^{53}Cr$ and Cr(VI) concentration at the shallow screen (A) and deep screen (B) of well R-45.

Figure options

3.5. Location and magnitude of reduction

The isotopic results are consistent with the prevailing conceptual model for this site in which contaminant Cr(VI) undergoes partial reduction in the vadose zone, primarily in the basalts, mixes with background Cr(VI) produced through natural weathering of the rock units, and then percolates into the regional aquifer at multiple arrival points (LANL, 2009 and LANL, 2012). The similarity in $\delta^{53}Cr$ values of contaminated regional aquifer wells could be taken as evidence that little reduction occurs in the regional aquifer. However, the presence of Fe(II)-bearing minerals in regional aquifer sediments makes it likely for some degree of reduction to occur, (Supplementary Fig. 2), unless such reduction capacity has been overwhelmed by ongoing inputs of Cr(VI).

The reduction capacity and kinetics of reduction in the vadose zone and regional aquifer are insufficient to completely attenuate the Cr(VI) plume as demonstrated by high concentrations at wells such as R-42. Using Eq. (1) and assuming δ_0 of 0‰ and $\varepsilon = 3.4$‰, it can be estimated that about 25% reduction of initial Cr(VI) has occurred along the entire flow path (cooling tower to regional aquifer) to R-42. If a lower value of $\varepsilon = 2$‰ is used instead, the degree of reduction increases to approximately 40%. Note that the degree of reduction for well R-42 shown on the reduction vector in Fig. 3 is for reduction in the vadose zone and regional aquifer only. The data presented herein represent a recent snapshot in time. It is unknown if the reduction capacity of the system has become less reactive over time due, for example, to armoring with Cr hydroxides or if the kinetics of reduction in the system have always been relativaly slow.

It is possible that the preceding calculations underestimate the true degree of reduction that has occurred. For example, if the actual ε value prevalent in LANL groundwater is significantly less than 3.4‰, the magnitude of reduction would be underestimated. A recent quantitative reactive transport modeling study has demonstrated that low effective epsilon values are associated with higher reduction rates and/or transport limitations (Wanner and Sonnenthal, 2013). In addition, Rayleigh models may underestimate reduction by several percent because of the assumption of closed system behavior (Abe and Hunkeler, 2006). The apparent lack of isotopic enrichment in the regional aquifer associated with the similarity in regional aquifer $\delta^{53}Cr$ measurements could reflect, in part, constant Cr(VI) inputs via multiple breakthrough points from the vadose zone to the regional aquifer over a wide area (Vesselinov et al., 2013). Similarly, the effective, field-relevant value of ε may be a factor of two or more less than that derived from laboratory batch experiments because of reservoir effects associated with possible diffusion of Cr(VI) into reducing microenvironments, thus causing significant underestimation of reduction (Clark and Johnson, 2008 and Berna et al., 2010).

4. Conclusions

Chromium isotopic measurements of LANL groundwaters provide strong evidence for reduction of Cr(VI) in vadose zone basalts, and possibly in other stratigraphic units containing Fe(II)-bearing minerals. Reduction and mixing with background Cr(VI) are important processes leading to observed Cr isotopic variation. Though the reducing capacity of the various volcanic and sedimentary units is significant, it is insufficient for complete natural attenuation of the Cr(VI) plume. The kinetics of reduction may be relatively slow or the reduction capacity may have been overwhelmed by the large mass and potentially higher historic concentrations of Cr(VI) that passed through the system. Alternatively, isolation of reduction capacity from groundwater (e.g., by armoring with precipitated Cr hydroxides or preferential flow bypassing reduction sites) may have occurred. Precise double-spiked Cr isotope analyses of Cr(VI) are a powerful tool to identify where in a hydrologic system Cr(VI) reduction is occurring. A fuller understanding of site-specific isotopic enrichment factors and fractionation models will improve the potential for quantitative estimates of Cr(VI) reduction.

Given the small number of previous publications on the usage of Cr isotopes to detect Cr(VI) reduction, this study provides insight into the effective use of this new approach and the potential for Cr(VI) reduction in certain systems. Our data interpretation is somewhat complex, making use of a detailed understanding of groundwater flow paths and the potential for multiple Cr(VI) sources. We suggest this level of complexity may be common in future applications of Cr isotope measurements in complex groundwater flow regimes. However, we emphasize that in complex flow regimes, constraining Cr(VI) reduction via Cr(VI) concentration data alone is even more difficult than in simple systems, making the isotopic approach all the more valuable. Finally, the use of multiple chemical data (e.g., Cr(VI)/sulfate ratios) can provide additional constraints to improve the interpretation of Cr isotope data.

The following are the supplementary data related to this article.

Supplementary information

Help with DOCX files

Options

Supplementary Fig. 1

Geologic cross-section along the primary Cr(VI) flow pathway with contaminant pathways shown. SCC-2 is a corehole that is approximately colocated with well SCI-2.

Help with ZIP files

Options

Supplementary Fig. 2

Elemental Capture Spectroscopy (ECS) log of iron from well R-28. XRF data from wells R-15 and R-12 have been extrapolated onto this log for comparison. Fe(II)-bearing minerals present in each unit are shown along with most recent $\delta^{53}Cr$ values from wells SCI-1, SCI-2, R-42, and R-28 (extrapolated based on their relative positions in the stratigraphic column). Note that SCI-1 is actually completed in a perched aquifer located at the top of the Cerros del Rio basalts in Puye sediments.

Help with ZIP files

Options

Supplementary Fig. 3.

Stratigraphy at SCC-2/SCI-2, moisture profile, and total Cr profiles for DI water leach and EPA Method 3050 digestion from core at this locality. DI and 3050 leach values for Cerros del Rio basalts from uncontaminated areas are shown.

Help with ZIP files

Options

Supplementary Fig. 4.

Cr/SO4 for surface waters (locations SCS-2 and SCS-3) and alluvial water (SCA-2) and for wells along the primary flow path of the Cr plume.

Help with PDF files

Options

Acknowledgments

This work was funded as part of the U.S. Department of Energy's investigation of legacy contamination at Los Alamos National Laboratory. This manuscript benefited significantly from the input of two anonymous reviewers.

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EXHIBIT

QQ

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RYAN FLYNN
Cabinet Secretary-Designate

BUTCH TONGATE
Deputy Secretary

Certified Mail - Return Receipt Requested

August 5, 2014

Ms. Kimberly Davis-Lebak, Manager
U.S. DOE National Nuclear Security Administration
Los Alamos Site Office (NA-00-LA)
3747 West Jemez Road
Los Alamos, NM 87544

Ms. Alison Dories, Associate Director
Environment, Safety, Health and Quality MS K491
Los Alamos National Security, LLC
P.O. Box 1663
Los Alamos, NM 87545

Re: Los Alamos National Laboratory, Major, Individual Permit; SIC 9711; NPDES Compliance Evaluation Inspection; NM0028355; July 7-9, 2014

Dear Ms. Dories:

Enclosed please find a copy of the report and check list for the referenced inspection that the New Mexico Environment Department (NMED) conducted at your facility on behalf of the U.S. Environmental Protection Agency (USEPA). This inspection report will be sent to the USEPA in Dallas for their review. These inspections are used by USEPA to determine compliance with the National Pollutant Discharge Elimination System (NPDES) permitting program in accordance with requirements of the federal Clean Water Act.

Introduction, treatment scheme, and problems noted during this inspection are discussed in the "Further Explanations" section of the inspection report.

You are encouraged to review the inspection report, required to correct any problems noted during the inspection, and advised to modify your operational and/or administrative procedures, as appropriate. If you have comments on or concerns with the basis for the findings in the NMED inspection report, please contact us (see the address below) in writing within 30 days from the date of this letter. Further, you are encouraged to notify in writing both the USEPA and NMED regarding modifications and compliance schedules at the addresses below:

Racquel Douglas
US Environmental Protection Agency, Region VI
Enforcement Branch (6EN-WM)
1445 Ross Avenue
Dallas, Texas 75202-2733

Bruce Yurdin
New Mexico Environment Department
Surface Water Quality Bureau
Point Source Regulation Section
P.O. Box 5469
Santa Fe, New Mexico 87502

If you have any questions about this inspection report, please contact Sarah Holcomb at 505-827-2798 or at sarah.holcomb@state.nm.us.

Sincerely,

/s/ Bruce J. Yurdin

Bruce J. Yurdin
Program Manager
Point Source Regulation Section
Surface Water Quality Bureau

cc: Racquel Douglas, USEPA (6EN-AS) by e-mail
Carol Peters-Wagnon, USEPA (6EN-WM) by e-mail
Everett Spencer, USEPA (6EN-WM) by e-mail
Brent Larsen, USEPA (6WQ-PP) by e-mail
Gladys Gooden-Jackson, USEPA (6EN) by e-mail
NMED District 2, Bob Italiano by e-mail
Mike Saladen, Team Leader, LANS ENV-RCRA by e-mail
Marc Bailey, LANS LLC, by e-mail
Gene Turner, USDOE, by e-mail

Form Approved
OMB No. 2040-0003
Approval Expires 7-31-85

EPA

NPDES Compliance Inspection Report

Section A: National Data System Coding

Transaction Code	NPDES	yr/mo/day	Inspec. Type	Inspector	Fac Type
1 N 2 S 3	N M 0 0 2 8 3 5 5 11	12 1 4 0 7 0 7 17	18 C	19 S 20	2

Remarks

N A T I O N A L R E S E A R C H L A B O R A T O R Y

Inspection Work Days	Facility Evaluation Rating	BI	QA	Reserved
67 69	70 4	71 N	72 N 73 74	75 80

Section B: Facility Data

Name and Location of Facility Inspected *(For industrial users discharging to POTW, also include POTW name and NPDES permit number)*	Entry Time /Date	Permit Effective Date
Los Alamos National Laboratory, managed by LANS, LLC and US Department of Energy, Los Alamos, NM. LANL is jointly operated by the U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA), Los Alamos Site Office (LASO) and Los Alamos National Security, LLC (LANS)	1000 hours / 7-7-2014	8-1-2007
	Exit Time/Date 1600 hours / 7-9-2014	**Permit Expiration Date** 7-31-2012

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)
Mr. Mike Saladen, Team Leader, ENV-RCRA, LANS, LLC (505) 665-6085
Mr. Marc Bailey, Environmental Professional, ENV-RCRA, LANS LLC (505) 665-8135
Mr. Gene Turner, Engineer, U.S. DOE, NNA, LASO (505) 667-5794
Mr. Marc Gallegos, LANL DSESH-STO FOD (505) 665-9050
Ms. Stephanie Griego, LANL STO-DO (505) 667-7560

Other Facility Data

SIC 9922, 9711, 9661, 9611

Name, Address of Responsible Official/Title/Phone and Fax Number
Ms. Kimberly Davis-Lebak, Manager, USDOE, NNSA, Los Alamos Field Office (505) 667-105, 3747 West Jemez Road, Los Alamos, NM 87544
ls. Alison Dories, Director, Environment, Safety, Health and Quality, Los Alamos National Security, LLC, PO Box 1663, Los Alamos, NM 87545 (505)

Contacted
Yes [ ] No [•]

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	Permit	S	Flow Measurement	M	Operations & Maintenance	N	CSO/SSO
S	Records/Reports	M	Self-Monitoring Program	S	Sludge Handling/Disposal	N	Pollution Prevention
S	Facility Site Review	M	Compliance Schedules	N	Pretreatment	N	Multimedia
S	Effluent/Receiving Waters	S	Laboratory	N	Storm Water	N	Other:

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

1. **Inspectors arrived on site and met with LANS, LLC and USDOE staff for an entrance interview on July 7, 2014. Introductions were made, credentials were presented, and the purpose of the inspection was discussed. LANS staff escorted the NMED inspectors around the facility as each outfall was toured over the three day inspections. An exit interview was held on July 9, 2014 to discuss preliminary findings.**
2. **Please see report for further information.**

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Telephone/Fax	Date
Sarah Holcomb /s/ *Sarah Holcomb*	505-827-2798	8-5-2014
Signature of Management QA Reviewer	**Agency/Office/Phone and Fax Numbers**	**Date**
ruce Yurdin /s/ *Bruce Yurdin*	505-827-2795	8-5-2014

Los Alamos National Laboratory	PERMIT NO. NM0028355

SECTION A - PERMIT VERIFICATION

PERMIT SATISFACTORILY ADDRESSES OBSERVATIONS DETAILS.	☒ S ☐ M ☐ U ☐ NA (*FURTHER EXPLANATION ATTACHED NO*)
1. CORRECT NAME AND MAILING ADDRESS OF PERMITTEE	☒ Y ☐ N ☐ NA
2. NOTIFICATION GIVEN TO EPA/STATE OF NEW DIFFERENT OR INCREASED DISCHARGES	☐ Y ☐ N ☒ NA
3. NUMBER AND LOCATION OF DISCHARGE POINTS AS DESCRIBED IN PERMIT	☒ Y ☐ N ☐ NA
4. ALL DISCHARGES ARE PERMITTED	☒ Y ☐ N ☐ NA

SECTION B - RECORDKEEPING AND REPORTING EVALUATION

RECORDS AND REPORTS MAINTAINED AS REQUIRED BY PERMIT DETAILS:	☒ S ☐ M ☐ U ☐ NA (*FURTHER EXPLANATION ATTACHED NO*)
1. ANALYTICAL RESULTS CONSISTENT WITH DATA REPORTED ON DMRs.	☒ Y ☐ N ☐ NA
2. SAMPLING AND ANALYSES DATA ADEQUATE AND INCLUDE	☒ S ☐ M ☐ U ☐ NA
a) DATES, TIME(S) AND LOCATION(S) OF SAMPLING	☒ Y ☐ N ☐ NA
b) NAME OF INDIVIDUAL PERFORMING SAMPLING	☒ Y ☐ N ☐ NA
c) ANALYTICAL METHODS AND TECHNIQUES.	☒ Y ☐ N ☐ NA
d) RESULTS OF ANALYSES AND CALIBRATIONS.	☒ Y ☐ N ☐ NA
e) DATES AND TIMES OF ANALYSES	☒ Y ☐ N ☐ NA
f) NAME OF PERSON(S) PERFORMING ANALYSES.	☒ Y ☐ N ☐ NA
3. LABORATORY EQUIPMENT CALIBRATION AND MAINTENANCE RECORDS ADEQUATE.	☒ S ☐ M ☐ U ☐ NA
4. PLANT RECORDS INCLUDE SCHEDULES, DATES OF EQUIPMENT MAINTENANCE AND REPAIR.	☒ S ☐ M ☐ U ☐ NA
5. EFFLUENT LOADINGS CALCULATED USING DAILY EFFLUENT FLOW AND DAILY ANALYTICAL DATA.	☒ Y ☐ N ☐ NA

SECTION C - OPERATIONS AND MAINTENANCE

TREATMENT FACILITY PROPERLY OPERATED AND MAINTAINED DETAILS	☐ S ☒ M ☐ U ☐ NA (*FURTHER EXPLANATION ATTACHED YES*)
1. TREATMENT UNITS PROPERLY OPERATED.	☐ S ☒ M ☐ U ☐ NA
2. TREATMENT UNITS PROPERLY MAINTAINED.	☒ S ☐ M ☐ U ☐ NA
3. STANDBY POWER OR OTHER EQUIVALENT PROVIDED	☐ S ☐ M ☒ U ☐ NA
4. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES AVAILABLE.	☒ S ☐ M ☐ U ☐ NA
5. ALL NEEDED TREATMENT UNITS IN SERVICE	☐ S ☐ M ☒ U ☐ NA
6. ADEQUATE NUMBER OF QUALIFIED OPERATORS PROVIDED.	☒ S ☐ M ☐ U ☐ NA
7. SPARE PARTS AND SUPPLIES INVENTORY MAINTAINED.	☒ S ☐ M ☐ U ☐ NA
8. OPERATION AND MAINTENANCE MANUAL AVAILABLE.	☒ Y ☐ N ☐ NA
STANDARD OPERATING PROCEDURES AND SCHEDULES ESTABLISHED	☒ Y ☐ N ☐ NA
PROCEDURES FOR EMERGENCY TREATMENT CONTROL ESTABLISHED.	☒ Y ☐ N ☐ NA

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SECTION C - OPERATIONS AND MAINTENANCE (CONT'D)

9. HAVE BYPASSES/OVERFLOWS OCCURRED AT THE PLANT OR IN THE COLLECTION SYSTEM IN THE LAST YEAR?	☒ Y ☐ N ☐ NA
IF SO, HAS THE REGULATORY AGENCY BEEN NOTIFIED?	☒ Y ☐ N ☐ NA
HAS CORRECTIVE ACTION BEEN TAKEN TO PREVENT ADDITIONAL BYPASSES/OVERFLOWS?	☐ Y ☒ N ☐ NA
10. HAVE ANY HYDRAULIC OVERLOADS OCCURRED AT THE TREATMENT PLANT?	☒ Y ☐ N ☐ NA
IF SO, DID PERMIT VIOLATIONS OCCUR AS A RESULT?	☒ Y ☐ N ☒ NA

SECTION D - SELF-MONITORING

PERMITTEE SELF-MONITORING MEETS PERMIT REQUIREMENTS. ☐ S ☒ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED YES)*
DETAILS:

1. SAMPLES TAKEN AT SITE(S) SPECIFIED IN PERMIT.	☒ Y ☐ N ☐ NA
2. LOCATIONS ADEQUATE FOR REPRESENTATIVE SAMPLES. Sigma (Outfall 03A022), and LANSCE (03A048)	☐ Y ☒ N ☐ NA
3. FLOW PROPORTIONED SAMPLES OBTAINED WHEN REQUIRED BY PERMIT.	☒ Y ☐ N ☐ NA
4. SAMPLING AND ANALYSES COMPLETED ON PARAMETERS SPECIFIED IN PERMIT.	☒ Y ☐ N ☐ NA
5. SAMPLING AND ANALYSES PERFORMED AT FREQUENCY SPECIFIED IN PERMIT.	☒ Y ☐ N ☐ NA
6. SAMPLE COLLECTION PROCEDURES ADEQUATE	☒ Y ☐ N ☐ NA
a) SAMPLES REFRIGERATED DURING COMPOSITING.	☒ Y ☐ N ☐ NA
b) PROPER PRESERVATION TECHNIQUES USED.	☒ Y ☐ N ☐ NA
c) CONTAINERS AND SAMPLE HOLDING TIMES CONFORM TO 40 CFR 136.3.	☒ Y ☐ N ☐ NA
7. IF MONITORING AND ANALYSES ARE PERFORMED MORE OFTEN THAN REQUIRED BY PERMIT, ARE THE RESULTS REPORTED IN PERMITTEE'S SELF-MONITORING REPORT?	☐ Y ☐ N ☒ NA

SECTION E - FLOW MEASUREMENT

PERMITTEE FLOW MEASUREMENT MEETS PERMIT REQUIREMENTS. ☒ S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED NO)*
DETAILS:

1. PRIMARY FLOW MEASUREMENT DEVICE PROPERLY INSTALLED AND MAINTAINED. TYPE OF DEVICE various	☒ Y ☐ N ☐ NA
2. FLOW MEASURED AT EACH OUTFALL AS REQUIRED.	☒ Y ☐ N ☐ NA
3. SECONDARY INSTRUMENTS (TOTALIZERS, RECORDERS, ETC.) PROPERLY OPERATED AND MAINTAINED.	☒ Y ☐ N ☐ NA
4. CALIBRATION FREQUENCY ADEQUATE.	☒ Y ☐ N ☐ NA
RECORDS MAINTAINED OF CALIBRATION PROCEDURES.	☒ Y ☐ N ☐ NA
CALIBRATION CHECKS DONE TO ASSURE CONTINUED COMPLIANCE.	☒ Y ☐ N ☐ NA
5. FLOW ENTERING DEVICE WELL DISTRIBUTED ACROSS THE CHANNEL AND FREE OF TURBULENCE.	☒ Y ☐ N ☐ NA
6. HEAD MEASURED AT PROPER LOCATION.	☒ Y ☐ N ☐ NA
7. FLOW MEASUREMENT EQUIPMENT ADEQUATE TO HANDLE EXPECTED RANGE OF FLOW RATES.	☒ Y ☐ N ☐ NA

SECTION F - LABORATORY

ERMITTEE LABORATORY PROCEDURES MEET PERMIT REQUIREMENTS. ☒ S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED NO)*
DETAILS:

1. EPA APPROVED ANALYTICAL PROCEDURES USED *(40 CFR 136.3 FOR LIQUIDS, 503.8(b) FOR SLUDGES)*	☒ Y ☐ N ☐ NA

SECTION F - LABORATORY (CONT'D)

2. IF ALTERNATIVE ANALYTICAL PROCEDURES ARE USED, PROPER APPROVAL HAS BEEN OBTAINED ☐ Y ☐ N ☒ NA
3. SATISFACTORY CALIBRATION AND MAINTENANCE OF INSTRUMENTS AND EQUIPMENT. ☒ S ☐ M ☐ U ☐ NA
4. QUALITY CONTROL PROCEDURES ADEQUATE. ☒ S ☐ M ☐ U ☐ NA
5. DUPLICATE SAMPLES ARE ANALYZED. 10 % OF THE TIME. ☐ Y ☒ N ☐ NA
6. SPIKED SAMPLES ARE ANALYZED. __ % OF THE TIME. ☐ Y ☐ N ☒ NA
7. COMMERCIAL LABORATORY USED. ☒ Y ☐ N ☐ NA

LAB NAME /LAB ADDRESS / PARAMETERS PERFORMED

1) General Engineering Laboratories LLC (GEL)/2040 Savage Road, Charleston, SC 29407 / TSS, Aluminum
2) American Radiation Services / 1903 Central Ave., Los Alamos, NM 87544 / E. coli

SECTION G - EFFLUENT/RECEIVING WATERS OBSERVATIONS. ☒ S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED NO.)*

OUTFALL NO.	OIL SHEEN	GREASE	TURBIDITY	VISIBLE FOAM	FLOAT SOL.	COLOR	OTHER
001	NONE	NONE	NONE	NONE	NONE	CLEAR	

RECEIVING WATER OBSERVATIONS

SECTION H - SLUDGE DISPOSAL

SLUDGE DISPOSAL MEETS PERMIT REQUIREMENTS. ☒ S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED NO.)*
DETAILS:

1. SLUDGE MANAGEMENT ADEQUATE TO MAINTAIN EFFLUENT QUALITY. ☒ S ☐ M ☐ U ☐ NA
2. SLUDGE RECORDS MAINTAINED AS REQUIRED BY 40 CFR 503. ☐ S ☐ M ☐ U ☒ NA
3. FOR LAND APPLIED SLUDGE, TYPE OF LAND APPLIED TO: compost (e.g., FOREST, AGRICULTURAL, PUBLIC CONTACT SITE)

SECTION I - SAMPLING INSPECTION PROCEDURES *(FURTHER EXPLANATION ATTACHED __)*

1. SAMPLES OBTAINED THIS INSPECTION. ☐ Y ☐ N ☒ NA
2. TYPE OF SAMPLE OBTAINED
   GRAB ______ COMPOSITE SAMPLE __ METHOD ______ FREQUENCY
3. SAMPLES PRESERVED. ☐ Y ☐ N ☐ NA
4. FLOW PROPORTIONED SAMPLES OBTAINED. ☐ Y ☐ N ☐ NA
5. SAMPLE OBTAINED FROM FACILITY'S SAMPLING DEVICE. ☐ Y ☐ N ☐ NA
6. SAMPLE REPRESENTATIVE OF VOLUME AND MATURE OF DISCHARGE. ☐ Y ☐ N ☐ NA
7. SAMPLE SPLIT WITH PERMITTEE. ☐ Y ☐ N ☐ NA

CHAIN-OF-CUSTODY PROCEDURES EMPLOYED. ☐ Y ☐ N ☐ NA

9. SAMPLES COLLECTED IN ACCORDANCE WITH PERMIT. ☐ Y ☐ N ☐ NA

Los Alamos National Laboratory
Compliance Evaluation Inspection
NPDES Permit No. NM0028355
July 7-9, 2014

Further Explanations

Introduction

On July 7-9, 2014, Sarah Holcomb of the New Mexico Environment Department (NMED), Surface Water Quality Bureau (SWQB) accompanied by Erin Trujillo, Bruce Yurdin and Daniel Valenta also of NMED SWQB, conducted a Compliance Evaluation Inspection (CEI) at the U.S Department of Energy (DOE), Los Alamos National Laboratory (LANL), jointly operated by Los Alamos National Security, LLC (LANS) and the U.S Department of Energy, National Nuclear Security Administration, Los Alamos Site Office (DOE). This inspection covered all outfalls of this permit.

LANL is classified as a major discharger under the federal Clean Water Act, Section 402, of the National Pollutant Discharge Elimination System (NPDES) permit program. It is assigned NPDES permit number NM0028355. This permit authorizes discharges from eleven (11) outfalls (as of the permit reapplication documentation dated February 2012) to several tributaries, 20.6.4.126 and 20.6.4.128 NMAC, thence to the Rio Grande of the Rio Grande Basin. Segment 20.6.4.126 NMAC includes the designated uses of coldwater aquatic life, livestock watering, wildlife habitat and secondary contact. Segment 20.6.4.128 NMAC includes the designated uses of livestock watering, wildlife habitat, limited aquatic life, and secondary contact.

The NMED performs a certain number of CEIs each year for the U.S. Environmental Protection Agency (USEPA), Region VI. The purpose of this inspection is to provide the USEPA with information to evaluate the Permittee's compliance with the NPDES permit. This inspection report is based on information provided by the Permittee's representatives, observations made by the NMED inspectors, and records and reports kept by the Permittee and/or NMED.

An entrance interview was conducted with LANS and DOE staff at approximately 1000 hours at LANL ENV-RCRA offices on the first day of this inspection. The inspector made introductions, presented credentials and discussed the purpose of this inspection. A tour of each of the facilities at each outfall was conducted over the first two days. Paperwork and other documentation was reviewed on the third, and an exit interview to discuss preliminary findings was conducted at 1530 hours on July 9, 2014 with LANS and DOE staff.

Treatment Scheme

There are eleven permitted outfalls at this facility, some of which discharge only periodically. All eleven outfalls were evaluated during this site inspection. Following is a brief description of these outfalls and their associated operational units:

Outfall 001

Outfall 001 is authorized to discharge power plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, reverse osmosis (RO) reject, floor and sink drains, and treated sanitary re-use to Sandia Canyon. TA-3-22 is a natural gas (diesel fuel backup) fired steam electric generating station that can provide steam and back-up electricity to various LANL technical areas. Make-up water for the cooling towers can be from either municipal water supply and/or sanitary effluent from the SWWS. Effluent from the SWWS is directed to the SWWS Recycle Tank (296K gallons) located adjacent to the power plant. Recycle tank overflow discharges to manhole "A" and is de-chlorinated with NALCO 7408, a sodium sulfite based oxygen scavenger. Discharge from manhole "A" continues to manhole "B", where tank overflow is combined with the above wastewater flows and discharged to Outfall 001. Make-up water for the boilers is from municipal water supply. Municipal water is treated with a water softener, an RO unit, and demineralizers before use in the boilers. Boiler blowdown is first sent to a dedicated flash tank, then to collection and blowdown tanks where carbon dioxide is used to adjust pH, then to the primary environmental tank prior to discharge via manhole "B" to Outfall 001. The oil water separator shown on flow diagrams for the facility is not used. In the event that secondary containment of oil tanks for equipment in the power plant basement fail, the plant's spill response procedures would be used to prevent or minimize oil from entering drains that lead to the primary environmental tank. Laboratory wastewater is disposed in a sink in the plant's basement, called a "trough" by on-site representatives, which discharges to the primary environmental tank. All other sinks at the power plant are reported to discharge to the sanitary sewer to the SWWS. Reject water from the water softener is sent to the SWWS plant while reject water from the RO unit and de-mineralizers is sent to either the primary or secondary environmental tanks where pH, conductivity and TSS are checked prior to discharge via manhole "B" to Outfall 001. Primary flow measurement is conducted using a 9-inch Parshall flume and secondary instrument to measure head and totalizer which is monitored by power plant operators using a supervisory control and data acquisition system. The Permittee does a thorough verification check of the secondary measurement device and primary device head gage using a calibrated block for three flows (0%, 50% and full range) through the flume every 6 months to a year. Comparison of the primary and secondary devices are within 5% to pass the verification check.

Outfall 05A055 – TA-16-1508, High Explosives Waste Water Treatment Plant (HEWTF)

Outfall 05A055 (055) is authorized to discharge treated wastewater from the high explosives wastewater treatment facility. TA-16-1508 treats wastewater from high explosives (HE) research and development, decontamination and decommissioning activities, and various other activities. Wastewater is generated at four contributing Technical Areas, and contained on site in a sump under the building. The facility has a Waste Acceptance Criteria (WAC) and waste is characterized by the generator and documented on a Waste Profile Form (WPF) filled out by the generator for approval before being sent to the facility. An HEWTF operator picks up HE wastewater from LANL generators in 55-gallon drums or by dedicated vacuum truck. All wastewater is received at two small sand filter tanks that discharge into an approximately 500 gallon transfer sump. Wastewater is pumped from the sump to an approximately 3000-gallon equalization holding tank to provide uniform flow through the plant. Wastewater passes through coalescing particulate filters, then a series of two (four total used alternately) activated carbon filters. Following the carbon filters, wastewater is conveyed through an ion-exchange system to remove ammonium, perchlorate and barium, then is directed into two post-treatment holding tanks. From the post-treatment tanks, treated waste is routed to a mechanical evaporator system that evaporates all, approximately 200 gallons per day, of the liquid waste. Occasionally, operational samples of the treated wastewater are collected to determine if quality meets effluent limits, should it be required to batch discharge wastewater from the ion-exchange tanks.

Outfalls 03A048 – TA-53, Los Alamos Neutron Science Center (LANSCE) Cooling Towers

Outfall 03A048 (048) is authorized to discharge cooling tower blowdown and other wastewater. These discharges are cooling tower blowdown from two sets of cooling towers at TA-53 Los Alamos Neutron Science Center (LANSCE). Bromicide for microbiological control is added to the cooling waters. Blowdown from cooling towers TA-53-963 and TA-53-979 is de-chlorinated using sodium/potassium sulfite prior to discharge.

Outfall 03A113 – TA-53, LANSCE Low Energy Demonstration Accelerator (LEDA) Cooling Towers

Outfall 03A113 (113) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is cooling tower blowdown from two sets of cooling towers at TA-53 Low Energy Demonstration Accelerator (LEDA). The discharge from cooling towers TA-53-293 and TA-53-952 blowdown is de-chlorinated using West R-630, a sodium and potassium sulfite, prior to discharge. Discharge from the cooling towers at the LANSCE LEDA was previously co-mingled with stormwater prior to discharge at Outfall 113, however the process water and stormwater pipes were separated and do not discharge together at this time.

Outfall 03A199 – TA-3, Laboratory Data Communications Center (LDCC) Cooling Tower

Outfall 03A199 (199) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is blowdown from two cooling towers at TA-3-1498. Formula 2011 is added to the cooling tower waters. Blow down is de-chlorinated using Formula 159 prior to discharge.

Outfall 03A022 – TA-3-127, Sigma Cooling Towers and Emergency Cooling System

Outfall 03A022 (022) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is cooling tower blowdown from the Sigma Cooling Tower at TA-3-127 and once through cooling water from an emergency cooling system. Blowdown from the cooling towers is de-chlorinated using Formula 159, an oxygen scavenger of potassium/sodium/bisulfite, prior to discharge. There was no mechanism available for de-chlorination of the once through emergency cooling system.

Outfall 03A160 – TA-35-124, National High Magnetic Field Lab Cooling Towers

Outfall 03A160 (160) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is blowdown from a rooftop cooling tower (for cooling electrical switch equipment) at TA-35-124 National High Magnetic Field Lab. No biocide is used and the discharge is not de-chlorinated. Discharge of blowdown enters a storm water drainage pipe to Ten Site Canyon, which is a tributary to Mortendad Canyon.

Outfall 03A181 – TA-55, Plutonium Facility, Cooling Towers

Outfall 03A181 (181) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is blowdown from three cooling towers at TA-55-6. NALCO® 7408 sodium bisulfate, also noted as a sodium sulfite in literature, and STA◦BR◦EX® (anti scaler), a liquid bromine based antimicrobial, is added to cooling water. Blowdown is de-chlorinated prior to discharge. Discharge from cooling towers are co-mingled with stormwater, including roof drain sources and paved surfaces from approximately one-fourth of the Plutonium Facility at Outfall 181. Monitoring samples are obtained outside the security fence at the Plutonium Facility.

Outfall 03A027 – TA-3-2327, Strategic Computing Complex (SCC) Cooling Towers

Outfall 03A027 (027) is authorized to discharge cooling tower blowdown and other wastewater. This discharge is cooling tower blowdown at TA-3-2327. The Sanitary Effluent Recovery or Reclamation Facility (SERF) and the reuse of sanitary effluent at the SCC Cooling Towers was on-line during this inspection. Blowdown from cooling towers is de-chlorinated prior to discharge.

Outfall 051 – TA-50, Radioactive Liquid Waste Treatment Facility (RLWTF)

The TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) discharges into Mortendad Canyon. This facility treats both low-level radioactive liquid waste (low-level RLW) and transuranic waste. These are treated in separate processes.

TA-50 receives the majority of industrial liquid waste via gravity flow through a double-walled Radioactive Liquid Waste Collection System (RLWCS). Approximately 1600 generating points discharge to TA-50 via this collection system. In addition, some waste is trucked to the facility. A Waste Acceptance Criteria (WAC) has been developed to limit, or eliminate, waste materials that the plant may be unable to adequately treat, which is characterized by the generator and documented on a Waste Profile Form (WPF) filled out by the generator. The WPFs are reviewed and if the waste meets with WAC, the generator receives approval from TA-50 staff to ship the waste to TA-50. The WPF is re-submitted and re-approved at least annually, and any time the characteristics of the waste change.

Some major facility equipment changes were completed in 2012. This included taking the primary clarifiers offline, installing new influent tanks and a new microfiltration system, as well as a new reverse osmosis system.

Wastewater entering the facility is initially held in a 75K influent tank, and if necessary, an additional 17K tank to control the flow rate through the treatment system. From the holding tank, influent was previously directed to a primary clarifier. Currently this unit is being bypassed and will eventually be taken out of service and removed. Internal recycle streams such as the daily purge of ultrafilter feed tanks, decant and filtrate from sludge treatment, and membrane cleaning solutions are directed to the primary treatment tank. Treatment consists of chemical addition (sodium hydroxide) to precipitate impurities, settling to remove most of these impurities, and gravity filtration of overflow waters through a mixed bed of sand and anthracite to remove additional solids. Solids collected in this step are drummed and disposed of as low level rad waste.

Flow is next passed through a new microfiltration unit that removes most of the remaining solids. Filtrate from the microfiltration can then be directed to ion-exchange columns for removal of perchlorate. The ion-exchange columns were not online at the time of this inspection. Flow from the ion exchange is directed to a reverse osmosis (RO) unit for final treatment. The RO unit removes any remaining suspended solids and almost all of the dissolved solids. RO permeate that meets NPDES permit limits goes to two FRAC tanks, and is then discharged to an evaporation unit. Outfall 051 has not discharged since November 2010. Facility representatives indicated that they plan to utilize the ability to discharge once the new permit is issued.

Reject from the RO process is conveyed back to the main influent tank. The effluent to reject ratio is approximately 3:1. The solids are shipped offsite (Washington) for drying, and then are disposed at a Nevada test site as low level waste.

A new RLWTF is still approximately 4-5 years away. Once the new facility is built, concentrate from the RO system will not be shipped offsite.

Outfall 13S – SWWS Plant

The SWWS facility is a 0.6 mgd design flow wastewater treatment plant. Influent is generated from sanitary waste around the lab, although approximately 10% of the influent is non-domestic, according to facility representatives. The non-domestic waste must have an approved Waste Profile Form (WPF) in accordance with the Waste Acceptance Criteria (WAC). The collection system consists of the sewer and 45 lift stations. Each lift station is equipped with two pumps (generally) and visual and audio alarms.

Influent is pumped into the plant headworks and flows through a mechanical bar screen. Wastewater then enters a grit chamber where rags along with inorganic material are removed. Any grit/solids removed from the wastewater are analyzed and then taken to the Los Alamos County landfill. A splitter box sends the influent into two equalization basins. The equalization basins are used to provide storage during the peak daytime wastewater flow for later treatment at night when little flow is received. Mixers within the basins provide aeration to minimize septic conditions from occurring. Submersible pumps, in response to programmable logic controls (PLC), move the influent into the six aeration basins in a uniform manner.

In the aeration basins, operated in parallel, compressed air is provided by centrifugal blowers on a PLC system that cycles on and off in a manner that promotes the nitrification/denitrification processes.

The effluent flows from the aeration basins into one of two 16 ft. circular clarifiers (North and South). Return activated sludge (RAS) is pumped back to the aeration basins to repeat the waste stabilization cycle.

Flow is then routed to a serpentine chlorine contact basin. Chlorination occurs with the use of a MIOX system. Effluent then passes through a Parshall flume with a Millitronics totalizer and is shunted to a lined holding pond where it may be pumped to a holding tank and re-used at TA-3. If a discharge at Outfall 13S is anticipated, effluent is diverted after the chlorine contact basin to a second Parshall flume, de-chlorinated with sodium bisulfite, then gravity flows to Canada del Buey. If possible, all effluent discharges to Canada del Buey via 13S are reported to EPA and SWQB in advance. Currently, all effluent is being re-used at TA-3. According to facility representatives, the SWWS facility has never discharged to Canada del Buey.

Sludge is wasted to sand filtered drying beds. Previously, after a suitable drying cycle, sludge below 50 ug/L PCBs was hauled to TA-54 where it was disposed in an appropriate manner. The SWWS facility, with the addition of the SERF facility's ability to remove PCBs, is now exploring options to compost sludge and reuse it around LANL. The first batch of compost was onsite at the time of this inspection and facility representatives were waiting on analytical testing to evaluate the quality of the compost.

Exit interviews were conducted at the end of each day of the inspection. A final exit interview to discuss the preliminary findings of this inspection was conducted from approximately 1530-1615 hours on July 9, 2014 with LANS and DOE staff at the site.

Los Alamos National Laboratory
Compliance Evaluation Inspection
NPDES Permit No. NM0028355
July 7-9, 2014

Further Explanations

Note: The sections are arranged according to the format of the enclosed EPA Inspection Checklist (Form 3560-3), rather than being ranked in order of importance.

Section C – Operations and Maintenance Evaluation – Overall Rating of "Marginal"

The permit states in Part I.B.1:

The permittee shall comply with the following schedule of activities for the attainment of state water quality standards-based final effluent limitations for

Total Copper Outfall ... 03A022

c. Implement corrective action and attain final effluent limitations no later than three (3) years from the effective date of the permit.

The permit states in Part I.A (page 15):

	Quantity/Loading		*Quality/Concentration*	
	Lbs/day unless stated		*mg/L unless stated*	
	Monthly Average	*Daily Max*	*Monthly Average*	*Daily Max*
Flow	*Report MGD*	*Report MGD*	***	***
Total Residual Chlorine	***	***	***	*0.011*
Total Copper	***	***	*0.019*	*0.028*

Findings for Operations and Maintenance

Prior to this inspection, there were numerous exceedances of the chlorine limit at Outfalls 03A181 (December 2013), 03A027 (August 2011), 03A113 (June 2012), 03A199 (August 2011, May 2012), and 03A048 (September 2011, April 2012, June 2013). In discussions with facility representatives at the outfalls where these exceedances occurred, it generally appeared that exceedances were due to equipment fouling or malfunction. Generally there were Preventative Maintenance procedures in place, but frequencies may need to be reevaluated to assure that the dechlorination equipment is functioning properly.

The site visit at 03A022 (Sigma Emergency Cooling System) resulted in two findings of a significant nature. There are two types of potential discharges at Sigma – the first being the discharge of sump water, which is treated cooling water. The second possible discharge is from the emergency cooling system. In the event of an activation of the emergency cooling system, potable water is used in a once-through cooling system. There is no dechlorination system present for the emergency cooling water, and the potable water carries a chlorine residual that in turn exceeds the water quality standards at the effluent pipe. **This is a repeat finding from the July 2009 NMED Compliance Evaluation Inspection.** There was an emergency discharge in May 2014 that exceeded the chlorine limitation in the permit.

Additionally, the second issue is compliance with the schedule in the permit to address copper exceedances at this particular outfall. Measures were required to be in place to mitigate copper exceedances by three years from the permit's effective date (the due date for compliance with the compliance schedule was August 1, 2010). During the visit on site, permittee's representatives explained that the source of the copper exceedances at this outfall was tracked to the heat exchanger unit (installed around 1969). Representatives indicated that although a meeting with USDOE had recently occurred, there was currently no timeframe established for replacement of this unit.

The facilities that discharge to Outfall 130 and Outfall 001 had containers on site that were not properly marked, or were double marked. Facility staff should ensure that all containers are labeled properly.

Section D – Self Monitoring Evaluation – Overall Rating of "Marginal"

The permit states in Part I.A (page 17):

...the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon..., in segment number 20.6.4.128 (from Outfall 03A113) of the Rio Grande Basin.

The permit states in Part I.A (page 5):

...the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon in Segment number 20.6.4.126 via outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A, or to Canada del Buey in Segment Number 20.6.4.128 of the Rio Grande Basin.

Findings for Self Monitoring

The permit description of the outfall at 03A022 authorizes discharges of cooling tower blowdown and "other wastewater". An ISCO sampler was located at the outfall (03A022) and may not be representative of the discharge at the facility due to comingling of process water (emergency cooling discharge) and stormwater. Facility representatives indicated that there may not be a way to sample the emergency discharge further up in the system where it would be representative. The manner in which the ISCO's intake was located may not collect a representative sample, in part due to the condition of the effluent pipe, which was cracked.

Similarly, the sampling location at 03A113 (LEDA cooling towers in TA 53) may not be representative of the monitored activity during or after a rain event due to the comingling of stormwater and cooling tower blowdown discharge.

The internal compliance monitoring point at the SWWS facility (Outfall 13S) is currently set at the end of the wastewater treatment train (after treatment by dechlorination). In the permittee's renewal application, a request was made to move the compliance monitoring point at 13S up to Outfall 001. There is nothing in the current permit that requires the compliance monitoring point to be at the current location, but the current compliance point is representative of the activity at SWWS. By moving this compliance point up to Outfall 001, the discharge from SWWS will be comingled with the other process wastewater discharges occurring at Outfall 001.

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Date: SEP 0 4 2014
Symbol: ENV-DO-14-0253
LAUR: 14-26902
Locates Action No.: U1402059

Ms. Racquel Douglas
U.S. Environmental Protection Agency, Region 6
Enforcement Branch (6EN-WM)
1445 Ross Avenue
Dallas, Texas 75202-2733

Mr. Bruce Yurdin
New Mexico Environment Department
Surface Water Quality Bureau
Point Source Regulation Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Dear Ms. Douglas and Mr. Yurdin:

Subject: NPDES Permit No. NM0028355, Response to Compliance Evaluation Inspection, July 7, 2014 through July 9, 2014

The New Mexico Environment Department, Surface Water Quality Bureau (NMED/SWQB) staff conducted an NPDES Compliance Evaluation Inspection (CEI) at NPDES outfall facilities at Los Alamos National Laboratory (Laboratory) on July 7-9, 2014. The Laboratory's Environmental Compliance Programs Group (ENV-CP) is submitting the enclosed (Enclosure 1) information in response to NMED/SWQB's inspection findings

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 if you have questions regarding this report.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Environmental Compliance Programs (ENV-CP)
Los Alamos National Security, LLC

ARG:MAB/lm

Enclosures: 1. NPDES Permit No. NM0028355, Response to Compliance Evaluation Inspection, July 7, 2014 through July 9, 2014

Cy: Everett Spencer, USEPA/Region 6, (E-File)
Gladys Gooden-Jackson, USEPA/Region 6, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Rick A. Alexander, STO-DO, (E-File)
Stephanie Q. Griego, STO-DO, (E-file)
Michael T. Saladen, ENV-CP, (E-File)
Marc A. Bailey, ENV-CP, (E-File)
LASOmailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, U1402059, (E-File)
env-correspondence@lanl.gov, (E-File)

ENCLOSURE 1

NPDES Permit No. NM0028355, Response to Compliance Evaluation Inspection, July 7, 2014 through July 9, 2014

ENV-DO-14-0253

LAUR-14-26902

U1402059

Date: SEP 0 4 2014

Los Alamos National Laboratory, NPDES Permit No. NM0028355
Compliance Evaluation Inspection (CEI) July 7-9, 2014
LANL's Response to CEI Report Findings
Action Item Number (U1402059)

Section C – Operations and Maintenance- Overall Rating of "Marginal"

C.1 Treatment Units Properly Operated- Rated Marginal

Findings

Prior to this inspection, there were numerous exceedances of the chlorine limit at Outfalls 03A181 (December 2013), 03A027 (August 2011), 03A113 (June 2012), 03A199 (August 2011, May 2012), and 03A048 (September 2011, April 2012, June 2013). In discussions with facility representatives at the outfalls where these exceedances occurred, it generally appeared that exceedances were due to equipment fouling or malfunction. Generally there were Preventative Maintenance procedures in place, but frequencies may need to be reevaluated to assure that the dechlorination equipment is functioning properly.

LANL Response:

Historically, cooling towers have been managed by different organizations throughout the Laboratory resulting in inconsistent maintenance of equipment, lack of routine inspections, and improper chemical application. The lack of operator expertise and resources at facilities are contributing factors. As a consequence, the inspection and maintenance program of these cooling towers and water treatment systems was modified.

To facilitate compliance with the requirements in the NPDES permit, Laboratory organizations have taken or are taking the following actions:

- Surveyed all existing cooling tower systems at the Laboratory. Replaced faulty equipment including pumps that inject chlorine neutralizer at specific cooling towers
- Placed chemical feed pumps on more rigorous inspection, maintenance, and replacement schedules
- Installed real-time monitoring at several cooling tower systems
- Installed additional treatment technologies to meet the more stringent standards in the permit (Ion exchange treatment columns)
- Evaluated the need for consistent cooling tower chemical treatment processes at all cooling towers, improved inspection and maintenance of cooling tower systems, and centralized operation and maintenance program to consistently monitor all cooling tower systems. and,
- Drafted a Scope of Work for water treatment contract. This activity is currently under review by LANL

C.3 Standby Power Or Other Equivalent Provided – Rated Unsatisfactory

C.5 All Needed Treatment Units In Service - Rated Unsatisfactory

Findings

The site visit at 03A022 (Sigma Emergency Cooling System) resulted in two findings of a significant nature. There are two types of potential discharges at Sigma – the first being the *discharge of sump water, which is treated cooling water. The second possible discharge is from the emergency cooling system. In the event of an activation of the emergency cooling system, potable water is used in a once-through cooling system. There is no dechlorination system present for the emergency cooling water, and the potable water carries a chlorine residual that in turn exceeds the water quality standards at the effluent pipe.* ***This is a repeat finding from the July 2009 NMED Compliance Evaluation Inspection.*** *There was an emergency discharge in May 2014 that exceeded the chlorine limitation in the permit.*

LANL Response:

Activities completed by Facility personnel to address the dechlorination issue when the Emergency Cooling System is engaged include:

- ISCO sampler set up at outfall to collect discharges from emergency cooling system during off-normal event – **June 5, 2014**
- Facility initiated routine surveillance of outfall to identify if additional discharges were occurring – **June 2014**
- DOE/LANS representatives conducted management assessment and walk through of Sigma facility – **June 12, 2014**
- Facility personnel initiated engineering controls to minimize the amount of time the Emergency Cooling System is engaged. Installation of new variable frequency drive for circulating pumps and new pump installed. -**May 2, 2014.**
- De-chlorination tablets installed at end of outfall pipe – **August 13, 2014**

C.9 Have Bypasses*/Overflows Occurred At The Plant Or In The Collection System In The Last Year, and Has Corrective Action Been Taken To Prevent Additional Bypasses/Overflows?
Rated as 'Yes'- bypasses have occurred over the past year and , 'No'- corrective actions have not been taken.

LANL Response:

The Laboratory responds to all sewer bypass/overflow occurrences. Each event triggers a corrective action. A Decision Tree document was developed jointly between DOE, LANS and NMED (March 10, 2009, copy available upon request) and each event is categorized using this document. Sewer bypasses/overflows are reported to NMED as required by the Decision Tree with a copy being sent to EPA.

Findings

Additionally, the second issue is compliance with the schedule in the permit to address copper exceedances at this particular outfall. Measures were required to be in place to mitigate copper exceedances by three years from the permit's effective date (the due date for compliance with the compliance schedule was August 1, 2010). During the visit on site, permittee's representatives explained that the source of the copper exceedances at this outfall was tracked to the heat *exchanger unit (installed around 1969). Representatives indicated that although a meeting with USDOE had recently occurred, there was currently no timeframe established for replacement of this unit.*

LANL Response:

Information regarding Compliance Schedule at Outfall 03A022:

- Ion exchange (IONX) for cooling tower blowdown in operation July 31, 2010.
- Copper exceedence May 5, 2011: suspected cross contamination from circulation water tank inside (known to have copper). Initiated design to discharge IONX-treated effluent directly to outfall pipe.
- Cooling tower blowdown treated by IONX, then discharged directly to outfall pipe outside via flexible hose on July 25, 2011.
- Cooling tower blowdown piped to sanitary collection system on November 16, 2011. IONX removed. Verification of no flow visits to outfall will continue.
- Discharge at outfall discovered November 26, 2012. Compliance samples collected with total copper exceeding permit limit. Cause was stuck makeup valve on circulation water tank inside. Facility personnel corrected the stuck makeup valve.
- Discharge at outfall discovered May 2, 2014. Compliance samples collected with total copper exceeding permit limit. Cause was stuck makeup valve on circulation water tank inside. Facility personnel submitted a request to replace makeup valve. The makeup valve was replaced on July 7, 2014. Additionally, the facility submitted a request for replacement of the outdated heat exchanger in July 2014 that is the suspected source of elevated copper in the circulation water tank inside the building.

Activities completed/to be completed by Facility personnel to address the copper issue:

- ISCO sampler set up at outfall to collect discharges from emergency cooling system during off-normal event – **June 5, 2014**
- Facility initiated routine surveillance of outfall to identify if additional discharges were occurring – **June 2014**
- DOE/LANS representatives conducted management assessment and walk through of Sigma facility – **June 12, 2014**
- Fact finding critique held to address potential copper exceedance occurring on August 13, 2014 – **August 25, 2014**
- Water in the recirculating water tank will be re-characterized to compare with the data from the STO-Facility's previous characterization. – **October 2014**
- Scope, estimate, design a new heat exchanger – **November 2014**

Section D – Self Monitoring Evaluation- Overall Rating of "Marginal"

D.2 Locations Adequate For Representative Samples. Sigma (Outfall 03A022), and LANSCE (03A048 [sic] (03A113)) **Rated as 'No'**

Findings

D.2 (a) *The permit description of the outfall at 03A022 authorizes discharges of cooling tower blowdown and "other wastewater". An ISCO sampler was located at the outfall (03A022) and may not be representative of the discharge at the facility due to comingling of process water (emergency cooling discharge) and stormwater. Facility representatives indicated that there may not be a way to sample the emergency discharge further up in the system where it would be representative. The manner in which the ISCO's intake was located may not collect a representative sample, in part due to the condition of the effluent pipe, which was cracked.*

LANL Response:

Roof drains at the Sigma Facility are tied in to the outfall pipe and cannot be easily separated. The ISCO sampler's intake is located at the point of discharge to the environment for Outfall 03A022. To ensure representative compliance samples are collected, LANL personnel do not collect samples during precipitation events. This eliminates the possibility of samples containing Emergency Cooling System or other industrial process water from being comingled with storm water discharges. Additionally, for samples collected by the automated ISCO sampler, site-wide precipitation data is reviewed to determine if the discharge was from a storm event, or from an industrial source.

During the next precipitation event the Laboratory will collect samples from Outfall 03A022 and evaluate the results against cooling tower/Emergency Cooling System discharge data.

D.2 (b) *Similarly, the sampling location at 03A113 (LEDA cooling towers in TA 53) may not be representative of the monitored activity during or after a rain event due to the comingling of stormwater and cooling tower blowdown discharge.*

LANL Response:

At Outfall 03A113, one of the two cooling towers (TA53-293) discharging to the outfall has been taken out of service (April 23, 2014). The remaining cooling tower (TA53-952, LEDA Cooling Tower) has a designated pipe discharging to Outfall 03A113 that cannot co-mingle with storm water. Therefore the samples are representative of the cooling tower blowdown.

D.2 (c) *The internal compliance monitoring point at the SWWS facility (Outfall 13S) is currently set at the end of the wastewater treatment train (after treatment by dechlorination). In the permittee's renewal application, a request was made to move the compliance monitoring point at 13S up to Outfall 001. There is nothing in the current permit that requires the compliance monitoring point to be at the current location, but the current compliance point is representative* *of the activity at SWWS. By moving this compliance point up to Outfall 001, the discharge from SWWS will be comingled with the other process wastewater discharges occurring at Outfall 001.*

LANL Response:

In the permit issued August 12, 2014 for Outfall 13S it states:

> *'During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon in Segment Numbers 20.6.4.126 via outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A, or to Canada del Buey in Segment Numbers 20.6.128 of the Rio Grande Basin.*
>
> *Such discharges shall be limited and monitored by the permittee as specified below:'*

When treated sanitary effluent is discharged to Outfall 001 or is used at any category 03A outfall, the monitoring requirements for Outfall 13S will be required. Operations staff at the sanitary treatment plant will continue to monitor the treatment train to maintain proper functioning of the plant.

Section F – Laboratory- Overall Rating of "Satisfactory"

F.5 Duplicate Samples Are Analyzed. 10% Of The Time- Rated as 'No'

Findings:

There were no comments in the 'Further Explanations' text.

LANL Response:

Laboratory duplicate samples are analyzed for each chain of custody submitted. Pursuant to Part III, Section 5 of the permit, contract laboratories used by LANL follow the required methods and analyze a duplicate sample for each analytical request submitted. This is performed by the laboratory to ensure an adequate quality control program for all analytical results. Copies of analytical data packages showing laboratory duplicates were submitted to the Inspectors, as requested.

NPDES Industrial Permit Outfall Locations

These maps display the locations of the outfalls as well as the discharge sources, such as buildings, cooling towers, and power plants.

EXHIBIT
tabbles
RR

Contact

Environmental Communication & Public Involvement

P.O. Box 1663 MS M996

Los Alamos, NM 87545

(505) 667-0216

Email

Where are the NPDES industrial outfalls?

Open in Google Earth | View in Google Maps

Outfall 001

Outfall 001 *for the* TA-3-22 Power Plant	
Description	The discharge of about 300,000 gallons of treated water per day from Outfall 001 creates a continuous flowing perennial reach in upper Sandia Canyon and supports a 3-acre wetland. Water meets all regulatory standards. Most of the water comes from the Co-Generating Power and Steam Plant, which provides heating to buildings at TA-3 in addition to steam for process needs and to produce electricity in one 10-megawatt and two 5-megawatt steam turbines/generators.
Permitted Discharge	Cooling towers, boiler blow-down drains, demineralizer backwash, R/O reject, floor and sink drains and treated sanitary re-use
Receiving Stream	Upper Sandia Canyon, Segment Number 20.6.4.126
Constituent Monitoring	Flow, TSS, E Coli, Total Residual Chlorine, Metals, pH, Temperature, PCBs, WET
Monitoring Frequency	Variable 1/week, 1/month, 1/year
Reporting Frequency	Monthly and annual Discharge Monitoring Reports (DMRs)

Outfall 13S

Outfall 13S *for the* TA-46-347 Sanitary Wastewater System (SWWS) Plant	
Description	Wastewater from sanitary sewer, other non-radiological drains and storm water from technical areas throughout the Laboratory are treated at the Sanitary Waste Water System Plant. Currently, no water is discharged at Outfall 13s. Treated sanitary effluent is pumped either to Outfall 001, or to the Sanitary Effluent Reclamation Facility (SERF) for tertiary treatment and reuse at the Strategic Computing Complex cooling towers. Outfall 13s is a sampling point after final treatment processes prior to pumping to Outfall 001 or to the SERF.
Permitted Discharge	Treated sanitary wastewater
Receiving Stream	Upper Sandia Canyon in Segment Numbers 20.6.4.126 or Canada Del Buey, Segment Number 20.6.4.128
Constituent Monitoring	Flow, BOD5, TSS, E. Coli, Total Residual Chlorine, pH, PCBs, and WET
Monitoring Frequency	Variable 1/week, 1/month, 1/year
Reporting Frequency	Monthly and annual Discharge Monitoring Reports (DMRs)

Outfall 051

Outfall 051 *for the* TA-50-1 Radioactive	

Liquid Waste Treatment Facility (RLWTF)	
Description	The Radioactive Liquid Waste Treatment Facility treats low level and transuranic radioactive liquid wastewater. A mechanical evaporator was installed so no water has been discharged at Outfall 015 since November 2010. Should the evaporator be offline, wastewater would then treated and discharged in batches to Mortandad Canyon. Discharged water meets all regulatory standards.
Permitted Discharge	Treated radioactive liquid waste
Receiving Stream	Ephemeral reach of Effluent Canyon, tributary to Mortandad Canyon, Segment Number 20.6.4.128
Constituent Monitoring	Flow, COD, TSS, Total Toxic Organics, Metals, Total residual Chlorine, pH, Perchlorate, PCBs, and WET
Monitoring Frequency	Variable 1/week, 1/month, 1/year
Reporting Frequency	Monthly, quarterly and annual Discharge Monitoring Reports (DMRs)

Outfall 05A055

Outfall 05A055 ***for the*** **TA-16-1508 High Explosives Wastewater Treatment Facility (HEWTF)**	
Description	The High Explosive Wastewater Treatment Facility (HEWTF) treats high explosive contaminated wastewater, storm water, and cooling tower blow-down from various sites in the southeast section of the Laboratory. Since

	an evaporator is normally used, the HEWTF has not discharged since November 2007. Should this malfunction, high explosives wastewater influent is effectively treated through multiple processes before being discharged into Cañon de Valle.
Permitted Discharge	Treated high explosives wastewater, storm water, and cooling tower blow-down
Receiving Stream	Ephemeral tributary to Canon de Valle, Segment Number 20.6.4.128
Constituent Monitoring	Flow, COD, TSS, Oil & Grease, Total Toxic Organics, TNT, RDX, Perchlorate, pH and WET
Monitoring Frequency	Variable 1/week, 1/month, 1/quarter, 1/year
Reporting Frequency	Monthly, quarterly and annual Discharge Monitoring Reports (DMRs)

Outfall 03A022

Outfall 03A022 *for the* TA-3-2274 Sigma Cooling Tower	
Description	Water discharged here includes treated cooling tower blow-down water and storm water from roof drains which is then discharged into Mortandad Canyon. Discharged water meets all regulatory standards. Under emergency facility shut down due to a power outage emergency cooling water, which is potable, overflows from the circulating water pump basin directly to this outfall.
Permitted Discharge	Cooling tower blow-down, storm water, emergency cooling water (potable water)
Receiving Stream	Ephemeral reach of Mortandad Canyon, Segment Number 20.6.4.128

Constituent Monitoring	Flow, TSS, Total Residual Chlorine, Phosphorus, Metals, pH and WET
Monitoring Frequency	Variable 1/day, 1/week, 1/quarter, 1/year
Reporting Frequency	Monthly, quarterly and annual Discharge Monitoring Reports (DMRs)

Outfall 03A181

Outfall 03A181 *for the* TA-55-6 Cooling Tower	
Description	Treated blow-down water from the Plutonium Facility cooling tower is discharged into Mortandad Canyon. Discharged water meets all regulatory standards.
Permitted Discharge	Cooling tower blow-down and other wastewater
Receiving Stream	Ephemeral reach of Mortandad Canyon, Segment Number 20.6.4.128
Constituent Monitoring	Flow, TSS, Total Residual Chlorine, Metals, pH and WET
Monitoring Frequency	Variable 1/day, 1/week, 1/month, 1/quarter, 1/year
Reporting Frequency	Monthly, quarterly and annual Discharge Monitoring Reports (DMRs)

Outfall 03A027

Outfall 03A027 *for the* TA-3-285 & 23127 Strategic Computing Complex (SCC) Cooling Towers

Description	The Strategic Computing Center cooling towers use treated effluent from the SERF facility to conserve potable water resources. The cooling tower blow-down consists of circulation water from the potable water system treated to remove minerals and biota and/or treated effluent from SERF. Water which meets all regulatory standards is then discharged into Sandia Canyon.
Permitted Discharge	Cooling tower blow-down and tertiary treated sanitary wastewater from SERF
Receiving Stream	Upper Sandia Canyon, Segment Number 20.6.4.126
Constituent Monitoring	Flow, TSS, E Coli, Total Residual Chlorine, Phosphorus, Metals, pH and WET
Monitoring Frequency	Variable 1/day, 1/week, 1/quarter and 1/year
Reporting Frequency	Monthly, quarterly and annual Discharge Monitoring Reports (DMRs)

Outfall 03A113

Outfall 03A113
for the
TA-53 Low Energy Demonstration Accelerator (LEDA) Cooling Towers

Description	Treated water from cooling tower blow-down and storm water from parking lots and roof drains is discharged into Sandia Canyon. Discharged water meets all regulatory standards.
Permitted Discharge	Cooling tower blow-down, and storm water runoff
Receiving Stream	Ephemeral tributary to Sandia Canyon, Segment Number 20.6.4.128

Towers

Description	Cooling towers for the Los Alamos Neutron Science Center provide cooling to equipment and systems at the accelerator facility. The treated water discharged into Los Alamos Canyon meets all regulatory standards.
Permitted Discharge	Cooling tower blow-down
Receiving Stream	Ephemeral tributary to Los Alamos Canyon, Segment Number 20.6.4.128
Constituent Monitoring	Flow, TSS, Total Residual Chlorine, Phosphorous, Metals, pH and WET
Monitoring Frequency	Variable 1/day, 1/week, 1/month, 1/quarter
Reporting Frequency	Monthly and quarterly Discharge Monitoring Reports (DMRs)

Outfall 03A160

Outfall 03A160 ***for the*** **TA-35-124/595 National High Magnetic Field Laboratory (NHMFL) Cooling Tower**

Description	A cooling tower provides water cooling to equipment and systems at the National High Magnetic Field Laboratory. The water is treated using a corrosion inhibitor then batched into two storage tanks. Water from these tanks is treated to remove copper prior to discharge into Ten-Site Canyon. Discharged water meets all regulatory standards.
Permitted Discharge	Cooling tower blow-down
Receiving Stream	Ephemeral tributary of Ten Site Canyon, Segment Number 20.6.4.128

Constituent Monitoring	Flow, TSS, Phosphorous, Metals, pH and WET
Monitoring Frequency	Variable 1/day, 1/week, 1/month1 /quarter
Reporting Frequency	Monthly and quarterly Discharge Monitoring Reports (DMRs)

EXHIBIT
SS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

AUG 1 2 2014

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (7010 2780 0002 4354 5701)

Mr. Alison M. Dorries
U.S. DOE Los Alamos Site Office
3747 West Jemez Road
Los Alamos, NM 87544

Re: NPDES Permit No. NM0028355
Final Permit Decision

Dear Mr. Dorries:

This package constitutes EPA's final permit decision for the above referenced facility. Enclosed are the responses to comments received during the public comment period and the final permit. According to EPA regulations at 40 CFR124.19, within 30 days after a final permit decision has been issued, any person who filed comments on that draft permit or participated in the public hearing may petition the Environmental Appeals Board to review any condition of the permit decision.

Should you have any questions regarding the final permit, please feel free to contact Isaac Chen of the NPDES Permits Branch at the above address or VOICE:214-665-7364, FAX:214-665-2191, or EMAIL:chen.isaac@epa.gov. Should you have any questions regarding compliance with the conditions of this permit, please contact the Water Enforcement Branch at the above address or VOICE:214-665-6468.

Sincerely yours,

WK Honker

William K. Honker, P.E.
Director
Water Quality Protection Division

Enclosures

cc (w/enclosures): New Mexico Environment Department

LA-UR-14-27491

NPDES PERMIT NO. NM0028355
RESPONSE TO COMMENTS

RECEIVED ON THE SUBJECT DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT IN ACCORDANCE WITH REGULATIONS LISTED AT 40CFR124.17

APPLICANT:

Los Alamos National Security, LLC Los Alamos National Laboratory PO Box 1663, K491 Los Alamos, New Mexico 87544	AND	U.S. Department of Energy Los Alamos Area Office, A316 3747 West Jemez Road Los Alamos, NM 87544

ISSUING OFFICE: U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

PREPARED BY: Isaac Chen
Environmental Engineer
Permits & Technical Section (6WQ-PP)
NPDES Permits Branch
Water Quality Protection Division
VOICE: 214-665-7364
FAX: 214-665-2191
EMAIL: chen.isaac@epa.gov

PERMIT ACTION: Final permit decision and response to comments received on the draft reissued NPDES permit publicly noticed on June 29, 2013.

DATE PREPARED: August 4, 2014

Unless otherwise stated, citations to 40CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of April 1, 2014.

SIGNIFICANT CHANGES FROM DRAFT PERMIT

There are significant changes from the draft reissued permit publicly noticed on June 29, 2013. All minor changes and their rationale for changes can be found in the following response to conditions of certification or response to comments.

A. Method 1668C for PCBs is added to the final permit in accordance with the State conditions of certification;

B. Effluent limitations and monitoring requirements for impaired parameters in discharges to impaired waters are added to the final permit in accordance with the State conditions of certification; and

C. 6T3 temperature limitation is added to Outfall 001 in accordance with the State conditions of certification.

State Certification
State certification letter from Mr. James Hogan (NMED) to Mr. William Honker (EPA), dated September 19, 2013, conditionally certifies that the discharge will comply with the applicable provisions of the Clean Water Act and with appropriate requirements of State law. NMED also includes comments in the certification letter.

Note: Inclusion of permit requirements to comply with conditions of certification are required by 40 CFR § 124.55(a)(2). Challenges to conditions of certification must be made through NMED. In any case, if conditions are based on procedures or guidelines, rather than state regulations or statutes, EPA would treat those conditions as recommendations or comments, and would respond accordingly. If any condition will result in less stringent permit conditions, then EPA would treat those conditions as a statement of the extent to which the permit could be made less stringent (see 40 CFR §124.53(e)(3)).

Comments Received From Other Entities
Letter from Ms. Kathleen Sanchez (TEWA Women United) to Ms. Diane Smith (EPA) via e-mail dated August 12, 2013.

Letter from Ms. Paula Garcia (New Mexico Acequia Association) to Ms. Diane Smith (EPA) via e-mail dated August 12, 2013.

Letter from Mses. Rachel Conn, Joni Arends, and Marian Naranjo (Communities For Clean Water) to Ms. Diane Smith (EPA) via e-mail dated August 13, 2013.

Letter from Ms. Becky Rafter (Georgia Women's Action for New Directions) to Ms. Diane Smith (EPA) via e-mail dated August 13, 2013.

Letter from Ms. Sheri Kotowski (The Carnelian Center) to Ms. Diane Smith (EPA) via e-mail dated August 13, 2013.

Letter from Messrs. Alison M. Dorries and Gene E. Turner (Los Alamos National Laboratory-LANL) to Ms. Diane Smith (EPA) via email dated August 13, 2013.

Individuals who sent comments via email are (in the order of last name): Ms. Diana Baker, Ms. Bobbe Besold, Ms. Jon Block, Mr. John Boomer, Ms. Jeanne Green, Mr. Don Hide, Ms. Marilyn Hoff, Ms. Dominique Mazeaud, Ms. Shannon Romeling, Ms. Ramona Ruark, Ms. Deborah Schreifels, and Ms. Jacqueline Wasilewski.

EPA's Responses to NMED's Conditions of Certification

Condition #1 (PCB Monitoring and Effluent Limitations): NMED conditioned that "USEPA must revise the draft permit to include a monitoring and compliance maximum discharge limit for Polychlorinated Biphenyls (PCBs) of 0.00064 micrograms per liter (µg/l). The State will require that monitoring and reporting of PCBs be performed in accordance with USEPA published Method 1668C or later revisions. Pursuant to 20.6.4.14.A (3) NMAC, Method 1668C is a State approved method for testing surface wastewater discharges. Additionally, Method 1668C has a Minimum Quantification Level (MQL) set at or below the applicable and limiting State WQS found in 20.6.4.900.J (2) NMAC. Further supporting this requirement is that Method 1668C is the only known and least restrictive and readily available laboratory wastewater sampling method that can reasonably assure that the proposed discharges do not exceed the WQS limits of 20.6.4.900.J (2) NMAC. As a valid state law condition and limitation pursuant to Section 401 (d) (33 U.S.C. §1341 (d)) and 40 C.F.R. 124.53(e)(3), and in accord with 20.6.2.2001.B NMAC, USEPA must include this requirement in the final permit. 33 U.S.C. 1341 (a); 40 C.F.R. §124.53 (a). USEPA will need to determine how footnotes or other language in the Final Permit should best be changed to meet this condition...."

Response: As required by the conditions of certification, the final permit includes daily maximum limit of 0.00064 µg/l of PCBs and NMED suggested footnote languages including the Minimum Qualification Level (MQL) for Method 1668 in the certification. When EPA proposed the draft permit, all footnotes related to PCB limitations and monitoring requirements were under the basis that analytical results from the Method 1668 are not for compliance purposes. EPA considers all NMED suggested permit language regarding PCBs that are incorporated into the final permit, including footnotes and MQL, to be integral to complying with NMED's condition of certification.

Condition #2 (Outfalls 001, 027 & 199, Discharges to Impaired Receiving Waters in 20.6.4.126 NMAC): NMED issued the following conditions:
(Condition #2a) For Outfalls 001, 027 and 199, Part I.A of the Final Permit must control aluminum and copper pollutants by the use of effluent limitations based on the most limiting applicable State WQS numeric criteria for the receiving stream in Segment 20.6.4.126 NMAC." NMED provided the following criteria

	Calculated Chronic Aquatic Life Criteria
Total Recoverable Aluminum	988.9 µg/L (0.9889 mg/L)
Dissolved Copper	7.3 µg/L (0.0073 mg/L)

Response: As required by the conditions of certification, EPA adds NMED provided numeric criteria for total recoverable aluminum and dissolved copper as daily maximum effluent limitations for Outfalls 001, 03A027 and 03A199.

EPA establishes a 3-year compliance schedule. This compliance schedule applies to all effluent limitations established based on NMED conditions of certification unless a more stringent limitation was already established in the expired permit.

(Condition #2b) For Outfall 199, Part I.A of the Final Permit must control mercury by the use of effluent limitations based on the most limiting applicable State WQS numeric criteria for the receiving stream in Segment 20.6.4.126 NMAC. NMED provided the following criteria

Pollutant	Designated Use	Numeric Criteria
Total Mercury	Wildlife Habitat	0.77 µg/L
Dissolved Mercury	Chronic Aquatic Life	0.77 µg/L

Response: As required by the conditions of certification, EPA adds NMED provided numeric criteria for total mercury and dissolved mercury as daily maximum effluent limitations for Outfall 03A199 (Note: the permittee needs to report both total and dissolved values). EPA establishes a 3-year compliance schedule as discussed above.

(Condition #2c) For Outfalls 001, 027 and 199, there were no effluent concentration data for adjusted gross alpha in the application. For pollutants that are Probable Causes of Impairment for which there are no effluent characteristic data, NMED requires confirmation of effluent characteristics, at least one time effluent characteristic monitoring and reporting as soon as practicable....

Response: As required by the conditions of certification, EPA adds monitoring and reporting requirements for adjusted gross alpha for Outfall 001, 03A027 and 03A199.

Because NMED did not specify the sample type and monitoring frequency, a grab sample and a minimum frequency of 1/year as required by the federal regulation are established for aluminum, copper and mercury. Monitoring frequency of once per permit term and grab sample are established for adjusted gross alpha. The general reopener clause in Part II.E. covers the reopener clause requirement.

Condition #3 (Outfalls 13S, 055, 051, 022, 181, 048, 113 & 160, Discharges to Impaired Receiving Waters in 20.6.4.128 NMAC): NMED issued following conditions:
(Condition #3a) For Outfalls 181, 113 and 048, Part I.A of the Final Permit must control copper pollutants by the use of effluent limitations based on the most limiting applicable State WQS numeric criteria for the receiving stream in Segment 20.6.4.128 NMAC. NMED provided the following criteria

Outfall #	Acute Dissolved Copper Aquatic Life Numeric Criteria
181	0.0115 mg/l (11.5 µg/l)
048	0.0233 mg/l (23.3 µg/l)
113	0.0218 mg/l (21.8 µg/l)

Response: As required by the conditions of certification, EPA adds NMED provided numeric criteria for dissolved copper as daily maximum limit to Outfalls 03A181, 03A048 and 03A113, respectively. A 3-year compliance schedule is established as discussed above.

(Condition #3b) NMED required mercury limitations to be established for Outfall 048 and stated that "For discharges that contribute to a currently listed impairment, a mercury WQBEL is required by 40 CFR 122.44(d)(1)(ii) and (iii) and State WQS 20.6.4.8.A.5 and 6 NMAC (Implementation Plan) consistent with the WQMP to ensure that NPDES permits are protective of State WQS. The following are the applicable numeric criteria in State WQS 20.6.4.900.H(7) for limited aquatic life and 20.6.4.900 NMAC:

Pollutant	Designated Use	Numeric Criteria
Total Mercury	Wildlife Habitat	0.77 μg/L
Dissolved Mercury	Acute Aquatic Life	1.4 μg/L

Response: As required by the conditions of certification, EPA adds NMED provided numeric criteria for total mercury and dissolved mercury as daily maximum limits to Outfall 03A048, respectively. A 3-year compliance schedule is established as discussed above.

(Condition #3c) For Outfalls 13S, 181, 113, 048 and 160, the Final Permit must control aluminum by the use of effluent limitations based on the applicable State WQS numeric criteria for the receiving stream in Segment 20.6.4.128 NMAC. Total recoverable aluminum WQBELs at least as protective of applicable State WQS are required by 40 CFR 122.44(d)(1)(ii) and (iii) and State WQS 20.6.4.8.A.5 and 6 NMAC and is consistent with the State WQMP. The acute aquatic life criteria apply to the receiving waters (State WQS 20.6.4.900.H(7) NMAC for Limited Aquatic Life) of Outfalls 13S, 181, 113, 048 and 160. Hardness-dependent Acute Aquatic Life numeric criteria for total recoverable aluminum can be calculated for this permit action as described in State WQS 20.6.4.900 NMAC using the outfall effluent total hardness as $CaCO_3$ in the application consistent with the USEPA reasonable potential analysis in the Fact Sheet. However, for CWA purposes, USEPA did not approve hardness-based equations for aluminum in waters with pH below 6.5 su in State WQS 20.6.4.900 NMAC. The pH limitations in the Draft Permit for receiving waters in Segment 20.6.4.128 NMAC are in a range between 6.0 to 9.0 standard unit consistent with the state WQMP. USEPA must incorporate an aluminum effluent limitation that is at least as stringent as state WQS. Requirement for aluminum effluent limitations more stringent than State WQS is not a condition of this certification.

Response: As required by the conditions of certification, EPA adds total recoverable aluminum limits to the following outfalls based on calculated acute aquatic life criteria:

Outfall #	13S	181	113	048	160
Al Limit (mg/l)	3.514	2.724	6.904	7.592	4.290

It is not clear whether NMED has determined the impairment is based on new WQS for total recoverable aluminum or is based on the previous dissolved aluminum WQS. NMED did not provide specific aluminum limits for pH range of 6.0 – 6.5, and stated that "Requirement for aluminum effluent limitations more stringent than State WQS is not a condition of this certification," EPA establishes one outfall-specific total recoverable aluminum limitation for each outfall in accordance with State conditions of certification. A 3-year compliance schedule is established as discussed above.

(Condition #3d) For Outfalls 051, 055 and 022 and to determine effluent characteristics, at least one time representative effluent characteristic analysis monitoring and reporting as soon as practicable for total recoverable aluminum for Outfalls 051, 055 and 022 and copper for Outfall 022 with a reopener clause condition is required in the Final Permit.

Response: As required by the conditions of certification, EPA adds a monitoring requirement for total recoverable aluminum for Outfalls 051, 055 and 022 and a monitoring requirement for dissolved copper for Outfall 022 at a frequency of once per permit term in the final permit.

(Condition #3e) For Outfalls 13S, 051, 055, 022, 181, 113, 048 & 160 and to determine effluent characteristics, at least one time representative effluent characteristic analysis monitoring and reporting as soon as practicable for adjusted gross alpha with a reopener clause condition is required in the Final Permit.

Response: As required by the conditions of certification, EPA adds a monitoring requirement for adjusted gross alpha for Outfalls 13S, 051, 055, 022, 181, 113, 048 & 160 at a frequency of once per permit term in the final permit.

Because NMED did not specify the sample type and monitoring frequency, grab sample type with the minimum frequency of 1/year as required by the federal regulation are established for parameters with limits. Monitoring frequency of once per permit term and grab sample are established for monitoring only parameters. The general reopener clause in Part II.E. covers the reopener clause requirement.

Condition #4 (Outfall 001, 6T3 Temperature Limitation with Schedule of Compliance) NMED conditioned that "The following additional limitations, measurement frequency and sample type must be incorporated into the Final Permit:

Pollutant	Limitation	Measurement Frequency	Sample Type
Temperature	6T3 Temperature of 20°C (68°F) shall not be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days.	While discharging, measurement of temperature must be at a frequency not to exceed 1/hr. [NMED clarified that it should read as "... at a frequency not less than 1/hour."]	Grab [NMED clarified that continuous record could be used.]

NMED recognizes that new or updated temperature monitoring instrumentation and/or procedures and operational changes may be needed to meet the 6T3 temperature limitations for discharges from Outfall 001 to the effluent-dominated receiving stream. Therefore, USEPA may choose to include a compliance schedule in the Final Permit to require compliance at the earliest practicable time.

Response: As required by the conditions of certification, EPA adds the condition provided by the NMED to the final permit. But, because NMED has not developed an implementation procedure to implement 6T3 Temperature WQS through the NPDES permit, and also because the permittee is working with NMED to conduct a site-specific designated use study and the study requires 2-3 summer time sampling events and may result in change of designated use for aquatic life, EPA establishes a "one-day before the permit expiration date" compliance schedule.

Condition #5 (Outfall 022, Effluent Monitoring and Limitations, Total Residual Chlorine) NMED conditioned that "If USEPA authorizes the discharge of once through cooling potable water in this permit action, then Part I.A of the Final Permit for Outfall 022 must also control TRC by the use of effluent limitations based on the most limiting applicable State WQS numeric criteria in 20.6.4.900 NMAC for the receiving stream in Segment 20.6.4.128 NMAC when Outfall 022 discharges once through cooling potable water. The following are the applicable and limiting numeric criteria in State WQS 20.6.4.900 NMAC:

	Wildlife Habitat	Acute Aquatic Life
Total Residual Chlorine	11 µg/L	19 µg/L "

Condition #9 (Additional Effluent Characteristic Analysis Monitoring for Chromium) NMED conditioned that "For Outfalls 027, 048 and 160, the Final Permit must include at least one time representative effluent characteristic analysis monitoring for chromium VI and reporting as soon as practicable...."

Response: As required by the conditions of certification, EPA has added a monitoring requirement for chromium VI at Outfalls 03A027, 03A048 and 03A160 in the final permit.

Condition #10 (Add Effluent Limitations if Reasonable Potential to Exceed State WQS, Additional Data submitted by Permittee) NMED conditioned that "USEPA reasonable potential analysis in the Fact Sheet indicated that for Outfall 027, effluent concentrations for total recoverable selenium had a reasonable potential to exceed State WQS, but those pollutants did not have effluent limitations in the Draft Permit. For Outfall 048, arsenic and total recoverable selenium had a reasonable potential to exceed State WQS, but those pollutants did not have effluent limitations in the Draft Permit. In addition to the monitoring and limitations in Part 1.A, or as required as a condition of certification, the Final Permit must control all pollutants that have a reasonable potential to exceed State WQS by the use of effluent limitations based on the most limiting applicable State WQS numeric criteria for the applicable receiving stream, in this case Segment 20.6.4.126 or Segment 20.6.4.128 NMAC, as appropriate."

Response: Additional effluent data and information provided by the permittee have demonstrated no RP for total recoverable selenium at Outfall 03A027. The draft permit had already included effluent limitations for total arsenic and total recoverable selenium at Outfall 03A048, which are retained in the final permit. No additional effluent limitations are required in the final permit.

EPA's Response to NMED's Comments

NMED Comment #1 (Monitoring Frequency): NMED requested USEPA to require a monitoring frequency for Outfall 051 of no less than once per year for PCBs, cadmium, mercury, nickel, and selenium. NMED requested that any case by case reasons for reducing the frequency found in NMIP Table 10 be documented in the Response to Comments for the Final Permit.

Response: Monitoring of those pollutants mentioned above is to collect data for future RP analysis and the frequency can be as few as once per permit term as described in NMED's Condition #6 for effluent characteristic analysis. The monitoring frequency suggested in NMIP Table 10 only apply to effluent limit monitoring. No change is made.

NMED Comment #2 (Outfalls 027 and 199, Rerun Reasonable Potential to Downstream Water, if needed include Limitations): NMED commented that NMED supports USEPA conducting a reasonable potential analysis for discharges from Outfall 199 that will reach a downstream water in Segment 20.6.4.126 NMAC. The reasonable potential analyses for Outfalls 027 and 199 should have also included effluent characteristics of Outfall 001 as ambient stream concentrations. NMED requested USEPA to re-run the analysis with the additional data. If pollutants have a reasonable potential to exceed state WQS, then any additional WQBELs would need to be incorporated into the Final Permit.

Response: EPA appreciates the comment and will discuss with NMED in more detail whether or not effluent characteristics of Outfall 001 can be used as ambient stream concentrations for RP analysis during the next permit renewal process.

Response: EPA did not propose to regulate TRC for the discharge of once through cooling potable water because such a discharge, if occurs, would be an emergency discharge for safety reason during unexpected electrical outage period. The permittee informed EPA that such discharges rarely happened and lasted only few minutes each time. Because the wildlife habitat WQS is more stringent than acute aquatic life WQS required by NMED in the condition of certification, EPA adds the TRC effluent limitation of 11 μg/l to the final permit.

Condition #6 (Outfalls 051, 055 and 022, Effluent Characteristic Analysis Monitoring and Reporting) NMED conditioned that "For Outfalls 051, 055 and 022, the Final Permit must include at least one time representative effluent characteristic monitoring and reporting as soon as practicable with a reopener clause condition to ensure that Permittee activities authorized in the NPDES permit are protective of applicable State WQS 20.6.4.128 and 20.6.4.900 NMAC consistent with CWA Section 401(d). USEPA must require effluent characteristic analysis monitoring, and may choose to require all required pollutants on NPDES Application Form 2C or the list of pollutants used to determine reasonable potential." NMED also stated that "Consistent with the NMIP for non-perennial waters, the following pollutants, if there are no effluent limitations in the Final Permit, must be analyzed and reported (note "(D)" means dissolved) when a discharge from Outfalls 051, 055 and/or 022 occurs:
Antimony (D), Zinc (D), Dieldrin, Arsenic (D), Aldrin, 2,3,7,8-TCDD dioxin, Nickel (D), Benzo (a) pyrene, Hexachlorobenzene, Selenium (D), Chlordane, PCBs, 4,4' -DDT and derivatives, Tetrachloroethylene, Thallium (D)."

Response: As required by the conditions of certification, the final permit includes one-time effluent characteristic analysis monitoring and reporting requirements when discharges occur. The general reopener clause in Part II.E. covers the reopener clause requirement.

Condition #7 (Outfall 051, Effluent Limitations, Hardness-Based Metals, Lead) NMED conditioned that "The total lead limitations in the Draft Permit would exceed the calculated applicable dissolved lead Acute Aquatic Life State WQS numeric criteria in 20.6.4.900 NMAC at the total hardness required in the Draft Permit (50 mg/L or greater). Dissolved hardness to total hardness is assumed to be a 1:1 ratio consistent with USEPA reasonable potential analyses in the Fact Sheet. Using a dissolved hardness as $CaCO_3$ of 50 mg/L, the dissolved lead Acute Aquatic Life numeric criteria presented in the table in State WQS 20.6.4.900(I)(3) NMAC is 0.030 mg/L (30 μg/L). USEPA must change lead limitations (calculated total lead and/or dissolved lead) that are at least as stringent as applicable and limiting State WQS numeric criteria for dissolved lead.".

Response: As required by the conditions of certification, EPA recalculates the effluent limitations based on the WQS of 0.030 mg/l dissolved lead, and establishes total lead daily maximum of 0.115 mg/l and monthly average of 0.076 mg/l at Outfall 051.

Condition #8 (Outfall 051, Effluent Limitations, Hardness-Based Metals, Chromium) NMED conditioned that "For Outfall 051, the Final Permit must include at least one time representative effluent characteristic analysis monitoring when Outfall 051 discharges for both chromium III and chromium VI and reporting as soon as practicable...."

Response: As required by the conditions of certification, EPA has added a monitoring requirement for chromium III and chromium VI at Outfall 051 in the final permit.

NMED Comment #3 (Reopener Clause): NMED suggested additional language to be included in the reopener clause.

Response: EPA may, but is not obligated to, reopen the permit for modification when new information becomes available in accordance with 40 CFR Part 122.62. Because the clause "new information" is broad enough to include almost any new information which may affect the permit conditions, it is not necessary to develop a permit-specific reopener clause. Also, the permit is designed to regulate the permittee, not the regulatory agency, and EPA also has the authority based on the federal regulations, not based on the permit languages, to modify the permit, if necessary. No change is made.

NMED Comment #4 (LANL Comments): NMED listed a summary of permittee's requests for changes in the final permit and requested that USEPA provide the final calculations used to determine effluent limitations in the Final Permit in their Response to Comments. NMED will review any changes between the Draft Permit and the Final Permit to determine if modifications (revision or addition) to this State conditional certification are warranted consistent with 40 CFR 124.53 and State WQS.

Response: The permit writer has contacted NMED staff to discuss whether or not NMED has identified any specific conflicts to the original State conditional certification. NMED has not identified any conflicts. EPA is not seeking re-certification prior to issuance of the final permit.

EPA's Responses to Individual Citizens and Citizens Groups (Citizens) Comments

Because most of comments from individuals and citizens groups addressed the same issues, EPA's responses to those comments are consolidated by issue, whenever appropriate.

Comment #1: Citizens commented that the NPDES permit allows for more than 1 million gallons of effluent to be discharged from industrial facilities into the canyons that flow to the Rio Grande every day.

Response: The above statement made by commenters is only partially correct. This permit renewal action does allow treated discharges from Los Alamos National Laboratory into canyons and those canyons are connected to the Rio Grande. However, those permitted discharges typically soak into the floor of the canyons and may reach the Rio Grande only due to direct response to precipitation events providing sufficient additional flow. EPA has no information how frequently and how much pollutants loads may actually reach all the way to the Rio Grande. Because discharges are to either ephemeral or intermittent streams, effluent limitations established for those discharges are based on water quality criteria without applying any dilution (criteria at the end-of-pipe). Therefore, those effluent limitations are much more stringent than if discharges are directly to the Rio Grande.

Comment #2: Citizens commented that to ensure that New Mexico surface water quality standards and EPA's anti-backsliding provision are met, EPA must require method 1668 for PCB monitoring and compliance purposes.

Response: The current human-health-based effluent limitations and analytical method for polychlorinated biphenyls (PCBs) were incorporated into the expired permit in 2007, as the result of the previous condition of State certification. In the current draft permit, EPA proposed: 1) to establish a new PCB limitation based on a default modified harmonic mean flow, and 2) to require Method 1668 for monitoring purposes only, and 3) to allow the 0.2 μg/l minimum quantification level (MQL) for compliance purposes. All of these changes are either permitted under the backsliding, or not in the scope of the anti-backsliding provision. The rationale for those changes are:

1) To establish a new PCB limitation based on a default modified harmonic mean flow: The NM Water Quality Standards (NMWQS), section 20.6.4.11.B.(1) states "For human health-organism only criteria, the critical low flow is the harmonic mean flow; .... For ephemeral waters the calculation shall be based upon the nonzero flow intervals and modified by including a factor to adjust for the proportion of intervals with zero flow." The PCB limitation established in the expired permit was based on "zero" harmonic mean flow which was in conflict with the NMWQS because NMWQS requires to use non-zero daily flow to calculate the harmonic mean flow. The newly proposed PCB limitation is based on a "non-zero" harmonic mean flow and therefore it results in a slightly less stringent effluent limitation. Although the proposed limitation is less stringent than the previous limitation, the change is allowed by the anti-backsliding policy because the previous limitation was in error.

2) To require Method 1668 for monitoring purposes only: The Clean Water Act (CWA), section 402(o) addresses the anti-backsliding prohibition, and it specifically prohibits less stringent effluent limitations with a provision of exceptions, but does not address the analytical method. In the fact sheet of the draft permit, EPA explained that Method 1668 (or PCB congener method) is not an EPA approved 40 CFR part 136 method. In the Federal Register Vol. 77, No. 97 (May 18, 2012), in EPA's final rule for "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures;" EPA stated "EPA is still evaluating the large number of public comments and intends to make a determination on the approval of this method at a later date." EPA also listed criticisms of the inter-laboratory study which include: (1) EPA did not produce documentation supporting changes to the method approved by EPA for the interlaboratory study, (2) the raw data for wastewater and biosolids was poor and is not fit for use in a comprehensive interlaboratory study, (3) EPA cited certain guidelines such as ASTM but deviated from those guidelines (e.g., used only one Youden pair per matrix), (4) the peer reviewers' qualifications were questioned, (5) the addendum and the pooled MDLs/MLs were not subjected to peer review, (6) MDL/ML are flawed, the process to calculate MDLs/MLs for congeners that co-elute was flawed, the MDL/ML ignored the ubiquitous problem of background contamination, and (7) the validation study did not include all matrices in the method (soil and sediment excluded). In addition, some commenters also suggested that EPA should first promulgate new detection and quantitation procedures. Further, commenters raised questions about possible adverse effects of this new method on compliance monitoring as well as concerns about data reporting and costs."

Method 608 or 625 (or PCB Aroclor method) is an approved 40 CFR part 136 method. Regulations at 40 CFR 122.44(i)(1)(iv) require use of an approved method for compliance purposes, but allows the permitting authority to specific a non-approved test method where there is no approved method. Since Method 608 or 625 are approved test methods that could be used for compliance purposes, EPA proposed, with the concurrence of LANL, to use the unapproved Method 1668 for reporting purposes to gather data at lower detection levels.

3) To allow the 0.2 μg/l minimum quantification level (MQL) for compliance purposes: EPA has developed MQLs to monitor compliance for permit limits below analytical values. The 0.2 MQL for PCB's reporting and compliance purposes is based on EPA approved analytical method for PCBs. Because Method 1668 for PCBs has not been approved, the MDL/ML for Method 1668 which were criticized by industry could not be used for compliance purposes. The permittee provided EPA with congener-based MQLs in accordance with the previous permit condition. But before Method 1668 and

its MDL/ML are approved by EPA, EPA may not use the permittee developed congener-based MQLs for compliance purposes. Once EPA has the approved congener method and MQLs, EPA will apply the approved method and MQLs to all dischargers.

However, Clean Water Act §401 allows states to require more stringent requirements as a condition for certification of the permit and regulations at 40 CFR 124.55(a)(2) requires the EPA to include requirements specified in a state certification under 40 CFR 124.53(e). Because New Mexico Environment Department (NMED) requires Method 1668 and congener-based MQLs to be used for compliance purposes as conditions of State certification, EPA incorporate those conditions into the final permit.

Comment #3: Citizens commented that effluent limits (or at the very least monitoring and reporting requirements) for impaired parameters should be required at outfalls into Montandad Canyon and Canada del Buey.

Response: In order to collect more data for further evaluations, EPA adds quarterly monitoring requirements for aluminum, copper and adjusted gross alpha at Outfalls 03A022, 03A181, and 051when discharges occur; and quarterly monitoring requirements for aluminum, adjusted gross alpha and PCBs at Outfall 013 if a discharge occurs.

Comment #4: Citizens commented that due to the drastically changed landscape due to large scale fires and drought, EPA must conduct updated Endangered Species Act (ESA) consultation with the US Fish and Wildlife Service (FWS) on southwestern willow flycatcher, black-footed ferret and Mexican spotted owl.

Response: EPA made the determination of "no effect" upon the 2000 consultation baseline. Although the wild land fire may change the environmental baseline, this permitting action will not result in fire or drought. As stated in the fact sheet and cited by the commenter, the Fish and Wildlife Service (FWS) found that the re-issuance of the NPDES permit would have "no effect" on the Mexican spotted owl and "may affect, not likely to adversely affect" the southwestern willow flycatcher. The FWS did not find that the black-footed ferret was present in the permit action area. EPA retained the "no effect" determination for Mexican spotted owl and black-footed ferret. In terms of effects on southwestern willow flycatcher, LANL has provided a statement "The only area of habitat that we currently manage as Southwestern Willow Flycatcher habitat is the wetlands complex on the north side of Pajarito Road just east of TA-18. We have been surveying the area since the mid-90s and have never had any nest, but we occasionally do have migrant Willow Flycatchers come through. Since none of them have stayed and nested we cannot say that they were the endangered southwestern subspecies." Furthermore, there is no NPDES outfall discharging to Pajarito Canyon where the habitat is located. Based on the information available, since the southwestern willow flycatcher has not been observed staying or nesting in LANL and no NPDES outfall discharge is to the habitat area, EPA has determined that this permitting action has also no effect on southwestern willow flycatcher. Therefore, EPA has determined that the reissuance of this permit will have no effects on any of those species.

Comment #5: Citizens commented that the final permit must do more to protect intermittent streams at LANL by applying the chronic life criteria to intermittent streams when calculating effluent limits.

Response: The NMWQS defines the reaches and designated uses of intermittent streams within the LANL. Both ephemeral and intermittent streams within LANL are categorized as 20.6.4.128 Rio Grande

Basin and the designated uses for those streams are livestock watering, wildlife habitat, limited aquatic life and secondary contact. The NMWQS, section 20.6.4.900.H(7) states "Limited Aquatic Life: The acute aquatic life criteria of Subsections I and J of this section apply to this subcategory. Chronic aquatic life criteria do not apply unless adopted on a segment-specific basis. Human health-organism only criteria apply only for persistent pollutants unless adopted on a segment-specific basis." NPDES permits are written to protect designated uses the State has assigned and do not circumvent the State's authority and the water quality standards process by assuming other uses apply. Citizens may continue to pursue NMED for changes of designated uses for intermittent streams within the LANL.

Comment #6: Commenters requested that EPA include additional language in the fact sheet about the following issues:

a. For Outfall 05A055, please include additional language in the Fact Sheet, as explained at the public meeting, about why permit limits for TNT at LANL are based on those for the Pantex plant.

Response: When state water quality standard or federal effluent limitation guidelines are not available to address the discharge from a particular process, EPA may establish monitoring requirements or effluent limitations based on best professional judgment (BPJ) per 40 CFR §122.44 (a). To adopt a limit from NPDES permit for another similar process is one of the approaches used by EPA to establish a BPJ-based limit. No change to the final permit is required in response to this comment.

b. For Outfall 13S, please include additional language in the Fact Sheet, as explained at the public meeting, about how the SERF treatment process removes PCBs and silica.

Response: Comment noted for the record. The SERF treatment process includes precipitation, flocculation, microfiltration and reverse osmosis. Through these processes, SERF reduces PCBs and silica.

c. V.7. Sewage Sludge Management. We learned at the public meeting that the Permittees plan to utilize state regulations for using sewage sludge as compost, possibly for reclamation sites (in order to provide nitrogen to the soils). The Permittees are working with NMED and the Solid Waste Bureau and the Ground Water Quality Bureau for registration and permitting. Please include language in the Fact Sheet, similar to that provided for the Section 401 certification process, that explains the public comment process for each and how a member of the public may sign-up for the Facility Mailing List for each bureau.

Response: Citizens need to contact NMED for information on how to participate in this State process.

d. VI. CWA 303(d) Impaired Water. Please include language in the Fact Sheet that NMED reviews the data for the Integrated Report and that the final report is submitted to EPA every two years. The next report is due to EPA in April 2014.

Response: Comment noted for the record. No change to the final permit required in response to this comment.

f. IX. Historical and Archeological Preservation Considerations. Please correct "mining" to "nuclear weapons research and development facility."

Response: Comment noted for the record. No change to the final permit required in response to this comment.

Please note: Written documents and/or information provided during the public comment period have been included in the permit's administrative records.

Comment #7: Citizens requested that EPA investigate why LANL and Los Alamos County are not subject to the Multi-sector General Permit 4 (MS-4) for their stormwater discharges into the canyons that flow to the Rio Grande.

Response: The EPA interprets this comment to refer to permitting of municipal separate storm sewer systems (MS4s) rather than the Multi-sector General Permit for storm water associated with industrial activity. MS4 permits are required for MS4s located within Urbanized Areas designated by the Bureau of the Census or where there has been a designation by the permitting authority. Los Alamos is not in a Urbanized Area and no separate designation has been made, so the MS4s in the Los Alamos area are not currently required to have MS4 permits. Discharges of storm water associated with industrial activity require NPDES permits other than MS4. LANL has an individual permit (NM0028355) covering industrial storm water.

EPA's Responses to LANL's Comments

General Comment #1: LANL commented that it supports the EPA's proposed limitations on the use of the PCB congener method for reporting purposes only and not for enforcement purposes. EPA issued a proposal (FR Vol. 75, No. 222, November 18, 2010) to incorporate the method into 40 CFR Part 136 and accepted comments addressing the validity of the method. EPA received comments from 35 respondents; only five (three states, one laboratory, and one laboratory organization) supported inclusion into Part 136. On May 18, 2012 EPA withdrew the proposed incorporation of the method (FR Vol. 77 No. 97, May 18, 2012). Moreover, LANL is the only known facility in New Mexico where the congener method is being used to determine compliance with an NPDES permit limit. The proposal to use Method 1668 for monitoring and reporting only is consistent with all other New Mexico NPDES permits that specify use of the method.

Response: Comment noted.

General Comment #2: LANL requested inclusion of schedules for compliance in the final permit, if necessary to address requirements incorporated into the final permit. LANL did not request a compliance schedule for specific requirements in the draft permit but will need to evaluate if compliance schedules are necessary to address any new or revised permit requirements incorporated into the final NPDES permit.

Response: Compliance schednles have been provided for those effluent limitations added to the final permit due to State conditions of certification - if allowed by the State certification.

General Comment #3: LANL requested elimination of the requirements related to selenium at Outfalls 03A027, 03A048, and 03A199 because there was no reasonable potential (RP) for selenium water quality standard exceedances. LANL explained that the appearance of selenium in samples taken at cooling towers was a false positive caused by bromine analytical interference. These cooling towers routinely use bromine as a biocide. It has been well established that when using EPA Method 200.8

(ICP-MS) for selenium analyses and bromine is present in the waste stream, there will be a positive interference and selenium will appear to be present in the sample. LANL documented this occurrence in comments submitted to EPA in 2006 on the current permit. As a result, the LANL used SW 846 Method 7742 (included in Section G. Test Methods in Part II of the current permit) for selenium monitoring and reporting purposes during the existing permit monitoring period. However, during sampling, analyses and reporting for NPDES Reapplication Project (Summer/Fall 2011), some selenium results were reported on the EPA's application Form 2C using EPA Method 200.8. These results indicated the presence of selenium, but they were false positives due to the presence of bromine. Upon discovery of the false positives, split samples from Summer/Fall 2011 were sent to the analytical laboratory for selenium re-analysis using SW 846 7742. The split sample results confirmed that selenium was not present in the samples. More recent sample results were also included.

Response: Sample results submitted by LANL indicate that results from EPA Method 200.8 have demonstrated RP and results from SW 846 7742 have demonstrated no RP. When EPA recalculated the RP based on the average value of all selenium data, the instream waste concentration (IWC) at Outfall 03A027 is 3.11 μg/l, at Outfall 03A048 is 8.62 μg/l, and at Outfall 03A199 is 0.47 μg/l, respectively. The most stringent applicable stream standard for total selenium is 5.0 μg/l. Therefore, EPA determines that there is no reasonable potential for selenium water quality standard exceedances at Outfalls 03A027 and 03A199. Effluent limitation remains for Outfall 03A048. Because EPA did not propose selenium limitations at Outfalls 03A027 and 03A199, no change is necessary.

General Comment #4: LANL requested that EPA delete Part I.B. Reporting of Monitoring Results (Major Discharges) from the draft permit, and retain only Part III.D.4 Discharge Monitoring Reports and Other Reports of this permit until the proposed NPDES Electronic Reporting Rule (FR/Vol. 78, No.146/July 30, 2013) is promulgated.

Response: Request is denied. Part I.B. Reporting of Monitoring Results applies to all dischargers. EPA intent was to require LANL to start using electronic reporting system (NetDMR) prior to the promulgation of EPA's NPDES Electronic Reporting Rule. Because LANL is not ready yet, EPA modifies the final language from "Monitoring information shall be submitted electronically as specified in Part III.D.4 of this permit...." to "Monitoring information shall be submitted as specified in Part III.D.4 of this permit...."

General Comment #5: LANL requested reduction in sampling frequencies at Outfalls 051 and 03A160 to once-per-week based on low discharge volumes and frequencies, and NMIP guidelines.

Response: EPA determines not to reduce the monitoring frequency for these two outfalls based on the following reasons: 1) discharges at Outfall 03A160 have potential to occur daily even though the discharge volume may be low; and 2) the permit allows LANL to adjust effluent hardness value so the discharge, if occurs, at Outfall 051 may comply with hardness dependent metal limitation and toxicity test; therefore, EPA considers that Outfall 051 may have potential to discharge more frequently. This decision will not cause additional monitoring burden at Outfall 051 when evaporators are used and no discharge occurs.

General Comment #6: LANL requested the deletion of the WET monitoring and reporting requirements for Outfalls 001, 03A027, 03A160, and 03A199 based on past WET testing results.

Response: The draft permit does not require WET tests at Outfall 03A160 and 03A199 because previous WET test results have demonstrated that discharges from these outfalls have met "effluent characterization single WET sample event" (Ec) requirement. Discharges at Outfall 001 are considered from a power utility, therefore, Ec does not apply to Outfall 001. Although Outfall 03A027 could be considered for Ec, the increase of discharge flow made the previous WET test result non-representative. Therefore, WET testing requirement for Outfall 03A027 is required. No change is made to the final permit.

General Comment #7: LANL requested that the EPA change notification and reporting requirements for spills and overflows on Page 1 of Part II.B of the draft NPDES permit from a 24-hour oral and 5-day written report to a 24-hour oral and a 7-day written report, so it will be consistent with the New Mexico Water Quality Control Commission regulations.

Response: Pursuant to 40 CFR §122.41(l)(6), under the provision of 24-hour reporting requirements for noncompliance which may endanger health or the environment, an oral reporting within 24 hours, followed by a written submission within 5 days of the time the permittee becomes aware of the circumstance shall be provided to the agency. The State's 7-day written reporting requirements are not consistent with federal requirements. No change is made to the final permit.

General Comment #8: LANL requested EPA refrain from adding any new effluent limits into the final permit for Outfalls 05A055 (no discharge since November 2007) and 051 (no discharge since November 2010) at this time. Establishing new effluent limits prior to evaluating new data would be premature and not be representative of existing conditions and treatment at the facilities, and effluent quality discharged to the environment. LANL requested the opportunity to provide EPA with new data for Outfalls 051 and 05A055, if discharges through these outfalls are initiated during the life of the new permit. These data would be used by EPA to evaluate the reasonable potential of water quality standard exceedances, and to establish potential new effluent limits at the respective outfalls based on current treatment technology at the time of discharge.

Response: It seems that LANL included this as a comment to NMED's conditions of certification. EPA must issue the permit with conditions as required by the State conditions in accordance with 40 CFR §124.55. If that is the case, LANL may appeal such permit conditions to the State. (Please see EPA's responses to State Conditions #3, #6, #7, and #8.)

Outfall 001 Specific Comments

Comment #1: LANL supported the lack of aluminum monitoring and reporting requirements and notes that the "no RP" conclusion was based on proper sampling methods.

Response: Comment noted.

Comment #2: LANL requested the deletion of the WET monitoring and reporting requirements for Outfall 001 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%).

Response: The discharge at Outfall 001 is categorized as minor industrial, therefore, chronic WET tests with a frequency of once per 5-years are required.

Comment #3: LANL requested to add Technical Area code (TA-3-22) to the description of Outfall 001.

Response: Technical Area code has been added as requested.

Outfall 13S Specific Comments

Comment #1: LANL requested the Latitude/Longitude modification be incorporated into the permit to identify the change in sampling location. The discharge location/sampling location for Outfall 13S is Latitude 35°51'08"N, Longitude 106°16'29"W. This is the location where Outfall 13S discharges into Canada del Buey.

Response: Change is made accordingly.

Comment #2: LANL requested to add TA-46-347 to the description of Outfall 13S.

Response: TA-46-347 has been added to Outfall 13S.

Comment #3: LANL provided the following statement and comment in response to a citizen's question about sanitary sludge compositing activities at LANL .

> "Public comments at the EPA Public Meeting on July 30, 2013 requested further information about composting activities at LANL. On August 15, 2012 the DOE/LANS notified EPA Region VI of its intent to compost and land apply biosolids at the Laboratory for beneficial use. The compost operation would take place at the Laboratory's TA-46 Sanitary Waste Water System (SWWS) Facility. Prior to initiating operations, the facility must register with the NMED's Solid Waste Bureau and provide a Notice of Intent to NMED's Ground Water Quality Bureau. The NOI and registration were submitted to NMED on July 31, 2012 and August 1, 2012 respectively. On December 21, 2012 DOE/LANS received a response from NMED suggesting the proposed land application would be surface disposal and not land application for beneficial use. LANS have consulted with NMED and intend to clarify and re-submit the NOI.
>
> Upon approval of the composting operation and land application method by NMED, Part IV Element 1 of the draft NPDES permit sets out requirements and conditions for preparation and reuse of biosolids (compost). The requirements are based on 40 CFR Part 503 regulations – Standards for the Use or Disposal of Sewage Sludge. The conditions in Part IV of the draft NPDES permit include: ceiling concentrations for metals and PCBs; monitoring and testing requirements; pathogen control; vector attraction reduction; general conditions; management practices; and, notification requirements. The draft permit and existing state and federal requirements adequately protect human health and the environment. Therefore no additional monitoring and reporting should be required."

Response: Statement and comment are noted.

Outfall 051 Specific Comments

Comment #1: LANL commented that public comments brought up at the EPA Public Meeting on July 30, 2013 requested further information regarding prior WET testing at RLWTF and recommended that this information be incorporated into the fact sheet for Outfall 051. LANL does not oppose this information being provided in the fact sheet and/or response to comments. Detailed information regarding prior WET testing and LANL's related corrective actions can be found in the quarterly compliance reports submitted to EPA from 2007 – 2013.

Response: Comment noted.

Comment #2: LANL requested to add TA-50-1 to Outfall 051.

Response: TA-50-1 has been added to description of Outfall 051.

Comment #3: LANL requested the flow monitoring requirements be changed from continuous/record to an estimate/once-per-day basis. RLWTF has not discharged since November 2010. If discharges to the Outfall 051 resume, it is estimated that RLWTF would only discharge intermittently under batch treatment and release. Flow is currently measured and reported based on tank volume discharge.

Response: Because RLWTF would only discharge intermittently under batch treatment if discharges resume, continuous/record monitoring is not necessary and daily estimate flow based on tank volume shall serve the purposes. Changes have been made accordingly to the final permit.

Comment #4: LANL requested that the definition of "estimate" for Outfall 03A022 be incorporated into the permit for Outfall 051. "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

Response: Note for "estimate" flow measurements has been added to the final permit.

Comment #5: LANL requested the sampling frequencies for copper, zinc and hardness be changed to once-per-week based on the NMIP. See General Comment #5.

Response: EPA determines to keep the 3/week frequency in case discharges at Outfall 051 occur more frequently. LANL is required to take one sample per day and up to three samples per week if discharges occur three or more days per calendar week.

Comment #6: LANL requested that the required 3-hr. composite WET test be replaced with a grab sample requirement. Typical flow durations for discharges from RLWTF through Outfall 051 only last approximately 1-1.5 hours. The NMIP sample type for once-per-week discharges at industrial outfalls is generally by grab and is appropriate here.

Response: The definition of "3-hour composite sample" given at Part II, section C.3. of the permit states "The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge." If only one or two samples could be collected, the operator may use whatever has been collected for composite and/or analysis. No change is made.

Outfall 05A055 Specific Comments

Comment #1: LANL requested that the new permit retain "Estimate" for the flow monitoring requirement at Outfall 05A055. The current permit defines "Estimate" as flow values that are be estimated using best engineering judgment. Outfall 05A055 has not discharged since November 2007. Typical discharges prior to November 2007 were low in volume and short in duration.

Response: Because no loading limitations are established at Outfall 05A055 and no discharge has been made since 2007, the term "estimate" flow is retained from the expired permit. EPA may reconsider the monitoring type if LANL resumes the discharge at Outfall 05A055.

Outfall 03A022 Specific Comments

Comment #1: LANL requested that the permit also incorporate once through cooling into the discharge description for emergency use only.

Response: Discharges of once-through cooling water for emergency only is added to the description of discharge in the final permit.

Comment #2: LANL requested the outfall be renamed "04A022". Historically, non-contact cooling water was categorized by the 04A designation. Outfall category 03A of the current permit is for treated cooling tower water discharges. The outfall description for 03A022 specifically states "Cooling tower blowdown is not authorized for discharge at this outfall." Therefore, the change of outfall name to 04A022 is more appropriate.

Response: Outfall 04A022 is assigned to this outfall.

Outfall 03A027 Specific Comments

Comment #1: LANL commented that EPA's RP calculation sheet documents an RP for selenium, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. LANL requested EPA not incorporate monitoring and reporting requirements or effluent limits in the permit for selenium at Outfall 03A027 due to analytical interference when using EPA Method 200.8. See General Comment #3.

Response: See EPA's response to LANL's General Comment #3.

Comment #2: LANL requested the deletion of the WET monitoring and reporting requirements for Outfall 03A027 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

Response: See EPA's response to LANL's General Comment #6.

Comment #3: LANL commented that Outfall 03A027 description should delete the reference to cooling tower TA3-285. Cooling tower TA3-285 has been inoperable for years and was demolished in 2012.

Response: TA3-285 has been deleted from the outfall description.

Comment #4: LANL requested the sample frequency for E Coli be changed to two-per-month, as indicated in the fact sheet. Page 15 of Part I.A of the draft permit specifies an E. Coli monitoring frequency of two-per-week. The monitoring frequency is 2-per-month based on the frequency recommended in the NMIP for a municipal facility with activated sludge technology and a design flow of 0.1 < 0.5 MGD.

Response: Monitoring frequency for E. coli has been changed to 2/month.

Outfall 03A048 Specific Comments

Comment #1: LANL requested the monitoring/reporting requirements and the effluent limits for selenium be deleted based on false positive results using Method 200.8. See General Comment #3.

Response: EPA recalculated the RP based on all effluent data available provided with LANL's comments and found RP for Outfall 03A048. See EPA's response to LANL's General Comment #3.

Outfall 03A160 Specific Comments

Comment #1: LANL requested deletion of cyanide requirements at Outfall 03A160. Cyanide is not used in operations of the cooling tower. The cyanide levels may have been a result of impacts from flying ash during the Las Conchas fire being deposited in the cooling tower. Additional cyanide samples recently collected at 03A160 do not confirm the result from the July 18, 2011 sample. In the alternative, if EPA retains cyanide requirements, LANL requested a reduction in sampling frequency from three-per-week to once-per-week at Outfall 03A160.

Response: Because cyanide concentrations in five additional samples taken during the comment period are all below the most stringent cyanide standard and below EPA's MQL, the average value of all data have demonstrated no RP, and cyanide is not used in operations, EPA determines to delete the effluent limitation for cyanide. But, because samples still showed trace amounts of cyanide, a monthly monitoring requirement is established to collect more data for future evaluation.

Comment #2: LANL requested a reduction in sampling frequency for copper from three-per-week to once-per-week at Outfall 03A160 based on NMIP. See General Comment #5.

Response: See EPA's response to LANL's General Comment #5.

Comment #3: LANL requested the deletion of the WET monitoring and reporting requirements for Outfall 03A160 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

Response: See EPA's response to LANL's General Comment #6.

Outfall 03A199 Specific Comments

Comment #1: LANL commented that EPA's Fact Sheet and RP calculation sheets documents an RP for selenium at Outfall 03A199, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. False positives for selenium at this cooling tower were caused by bromine analytical interference. LANL requested EPA not incorporate monitoring and reporting requirements or effluent limits in the permit for selenium at Outfall 03A199. See General Comment #3.

Response: See EPA's response to General Comment #3.

Comment #2: LANL commented that EPA's Fact Sheet and RP calculation sheets documents an RP for cyanide at Outfall 03A199 but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. The cyanide result in EPA's RP calculation sheet is documented at 13.6 µg/l. However, the NPDES Re-applications Form 2C documents a non-detect analytical result for cyanide (< 1.5 µg/l). LANL requested that EPA not include monitoring and reporting requirements or permit requirements for cyanide because no reasonable potential exists.

Response: The cyanide value used in RP screening was an error. Because there is no RP, effluent limitations and monitoring requirements for cyanide are not established in the permit.

Comment #3: LANL commented that EPA's RP calculation sheet documents a reasonable potential for copper at Outfall 03A199, but monitoring/reporting requirements and effluent limits are not incorporated into the draft permit. Based on the copper result of 13.2 µg/l and a hardness of 122 mg/l in the permit reapplication Form 2C, the potential effluent limit should be 26.7 µg/l.

Response: RP analysis indicated that the discharge at Outfall 03A199 has a RP to exceed the acute aquatic life standard in the perennial portion of Sandia Canyon in Waterbody Segment No. 20.6.4.126. The stream hardness of 78.8 mg/l in that water segment was used to calculate the effluent limitations. No change is made.

Comment #4: LANL requested the deletion of the WET monitoring and reporting requirements for Outfall 03A199 based on past WET testing results (no lethal effects to test species at or below the critical dilution of 100%). See General Comment #6.

Response: See EPA's response to LANL's General Comment #6.

Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

NPDES Permit No. **NM0028355**

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended,
(33 U.S.C. 1251 et. seq; the "Act"),

Los Alamos National Security, LLC
Management Contractor for Operations
Los Alamos, New Mexico 87544

and

U.S. Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

are authorized to discharge from a facility located at Los Alamos,

to receiving waters named: Perennial portion of Sandia Canyon in Waterbody Segment No. 20.6.4.126, and Mortandad Canyon, Canada del Buey, Los Alamos Canyon, ephemeral portion of Sandia Canyon, Ten Site Canyon, and Canon de Valle, in Waterbody Segment No. 20.6.4.128 of the Rio Grande Basin,

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Parts I [Requirements for NPDES Permits], II [Other Conditions], III [Standard Conditions for NPDES Permits], and IV [Sewage Sludge Requirements] hereof.

This permit supersedes and replaces NPDES Permit No. NM0028355 issued on June 8, 2007.

This permit shall become effective on October 1, 2014

This permit and the authorization to discharge shall expire at midnight, September 30, 2019

Issued on August 12, 2014

Prepared by

William K. Honker, P.E.
Director
Water Quality Protection Division (6WQ)

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NPDES Permits Branch (6WQ-P)

LA-UR-14-27491

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PART I - REQUIREMENTS FOR NPDES PERMITS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL 001

Discharge Type: Continuous
Latitude 35°52'26"N, Longitude 106°19'09"W (TA-3-22)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge Power Plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, R/O reject, floor and sink drains, and treated sanitary re-use to Sandia Canyon, and the discharge creates a perennial portion of Sandia Canyon, Segment Number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS CONCENTRATION (mg/L, unless stated) MONTHLY AVERAGE	DAILY MAXIMUM	LOADING (Lbs/day, unless stated) MONTHLY AVERAGE	DAILY MAXIMUM	MONITORING REQUIREMENTS FREQUENCY	SAMPLE TYPE
Flow (MGD)	***	***	Report	Report	Continuous	Record
TSS	30	100	Report	Report	1/Month	24-hr Composite
E. Coli (#/100 ml) (*1)	126	410	***	***	2/Month	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total Recoverable Aluminum	***	0.9889 (*3)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*3)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
6T3 Temperature (°C)	(*4)	(*4)	***	***	1/Hour	Grab (or Continuous Record)
Total PCB (μg/l) (*5)	0.00064	0.00064	Report	Report	1/Year	24-hr Composite
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*6) (7-day Static Renewal)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ceriodaphnia dubia	Report	Report	1/5 Years	24-Hr Composite
Pimephales promelas	Report	Report	1/5 Years	24-Hr Composite

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge from Outfall 001.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FOOTNOTES
*1 Logarithmic mean. Effluent limitations and monitoring requirements only apply when effluent from Outfall 13S is rerouted and discharged at Outfall 001.
*2 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*3 Effluent limitations take effective on the date of three years from the effective date of the permit.
*4 6T3 Temperature of 20° C (68° F) shall not be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days. The effluent limitation 6T3 = 20° C takes effective on the date one-day before the permit expiration date.

*5 EPA published congener Method 1668 Revision and detection limits shall be used. [The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).] Human health-based limitations.

*6 Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section G. Whole Effluent Toxicity (7-Day Chronic Testing).

OUTFALL 13S

Discharge Type: Continuous
Latitude 35°51'08"N, Longitude 106°16'29"W (TA-46-347)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon in Segment Numbers 20.6.4.126 via outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A, or to Canada del Buey in Segment Numbers 20.6.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	Continuous	Record
BOD	30	45	73	109	1/Month	24-hr Composite
TSS	30	45	73	109	1/Month	24-hr Composite
E. Coli (#/100 ml) (*1)	548	2507	***	***	2/Month	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total PCB (µg/l) (*3,*4)	0.00064	0.000642	Report	Report	1/Year	24-hr Composite
Total Recoverable Aluminum	***	3.514 (*5)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*6)	MONTHLY AVG MINIMUM	48-HOUR MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE

(48-hr Static Renewal) Daphnia pulex	Report	Report	1/ 2-Years	24-Hr Composite

FOOTNOTES

*1 Logarithmic mean. If the wastewater is discharge at other outfall, it shall comply with effluent limitations and monitoring requirements for E. coli as established for Outfall 13S.

*2 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 If the wastewater is discharge at other outfall, it shall comply with effluent limitations and monitoring requirements for PCBs as established for Outfall 13S. EPA published congener Method 1668 Revision and detection limits shall be used for reporting purposes. The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).

*4 Human health-based limitation.

*5 Effluent limitations take effective on the date of three years from the effective date of the permit.

*6 1st sample in the 1st year of the permit and 2nd sample in the 3rd year of the permit. The WET test should occur between November 1 and March 31. If discharges are not expected to occur during this sampling period, the test should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%.
See Part II, Section H. Whole Effluent Toxicity (48-Hr Acute Testing).

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements shall be taken at the following location(s): at the flow measuring device in Canada del Buey only when a discharge occurs at the outfall.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 051 - Radioactive Liquid Waste Treatment Facility

Discharge Type: Intermittent
Latitude 35°51'54"N, Longitude 106°17'52"W (TA-50-1)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated radioactive liquid waste to Mortandad Canyon in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*5)
COD	125	125	***	***	1/Month	Grab
TSS	30	45	73	109	1/Month	Grab
Total Toxic Organics (*1)	1.0	1.0	***	***	1/Month	Grab
Ra 226+228 (pCi/l)	30	30	***	***	1/Week	Grab
Total Chromium	1.34	2.68	***	***	1/Week	Grab
Total Lead	0.076	0.115	***	***	1/Week	Grab
Total Copper	0.014	0.014	***	***	3/Week	Grab
Total Zinc	0.191	0.191	***	***	3/Week	Grab
Total Hardness	Greater than or equal to 50 mg/l				3/Week	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total Cadmium	Report	Report	***	***	2/Term (*3)	Grab
Total Mercury	Report	Report	***	***	2/Term (*3)	Grab
Total Nickel	Report	Report	***	***	2/Term (*3)	Grab
Total Selenium	Report	Report	***	***	2/Term (*3)	Grab

Perchlorate	Report	Report	***	***	1/Week	Grab
Total PCB (µg/l)	Report	Report	***	***	2/Term (*3)	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium III	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
Whole Effluent Lethality (PCS 22414) (48-Hr NOEC) (*4)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	100%	100%	1/3 Months	3-Hr Composite

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetracblorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 At least two samples from different discharge events shall be taken during the term of the permit if discharges occur. EPA published congener Method 1668 Revision and detection limits shall be used for reporting purposes. The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).

*4 Monitoring and reporting requirements begin on the effective date of this permit. 100% limitation becomes effective on March 1, 2016. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. Also see Part II, Section I. Whole Effluent Toxicity (48-Hour Acute Limits).

*5 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following the final treatment and prior to or at the point of discharge from TA-50-1 treatment plant.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 05A055 - High Explosives Waste Water Treatment Plant

Discharge Type: Intermittent
Latitude 35°50'49"N, Longitude 106°19'51"W (TA-16-1508)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated waste water from the high explosives waste water treatment facility to a tributary to Canon de Valle in segment number 20.6.4.128 of the Rio Grande Basin

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*4)
COD	125	125	***	***	1/Quarter	Grab
TSS	30	45	***	***	1/Quarter	Grab
Total Toxic Organics (*1)	1.0	1.0	***	***	1/Quarter	Grab
Oil and Grease	15	15	***	***	1/Quarter	Grab
Trinitrotoluene	0.02	Report	***	***	1/Quarter	Grab
Total RDX	0.20	0.66	***	***	2/Month (*2)	Grab
Perchlorate	Report	Report	***	***	1/Year	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*3) (48-Hour Static Renewal)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	Report	Report	1/5 Years	3-Hr Composite

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 One sample should be taken before the 15th of the month and another taken after the 15th of the month.

*3 The WET test should occur during the period of November 1 to March 31 after the effective date of the permit. If no discharge is expected during this period, testing should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section H. Whole Effluent Toxicity (48-Hour Acute Testing).

*4 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 04A022

Discharge Type: Intermittent
Outfall 03A022: Latitude 35°52'14"N, Longitude 106°19'01"W (TA3-2274)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge storm water, roof drain water, and once-through cooling water for emergency use only to Mortandad Canyon, in segment number 20.6.4.128 of the Rio Grande Basin. (Cooling tower blowdown is not authorized for discharge at this outfall.)

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)			
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine	***	0.011	***	***	1/Week (*1)	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Dissolved Copper	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

Note (*1) When discharge of once-through cooling water for emergency purposes only.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FLOW MEASUREMENTS

"Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

OUTFALL 03A181

Discharge Type: Intermittent
Outfall 03A181: Latitude 35°51'50.8"N, Longitude 106°18'05"W (TA55-6)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge storm water, cooling tower blowdown and other wastewater to Mortandad Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Dissolved Copper	***	0.0115 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	2.724 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A113

Discharge Type: Intermittent
Outfall 03A113: Latitude 35°52'03"N, Longitude 106°15'43"W (TA-53-293, 294, 952, 1032, & 1038)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Dissolved Copper	***	0.0218 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	6.904 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALLS 03A027

Discharge Type: Intermittent
Outfall 03A027: Latitude 35°52'26"N, Longitude 106°19'08"W (TA3-2327)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
E. Coli (#/100 ml) (*2)	548	2507	***	***	2/Month	Grab
Total Recoverable Aluminum	***	0.9889 (*3)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*3)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
Whole Effluent Toxicity Testing (7-day Static Renewal) (*4)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE

Ceriodaphnia dubia	Report	Report	1/5 Years	24-Hr Composite
Pimephales promelas	Report	Report	1/5 Years	24-Hr Composite

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Logarithmic mean. Effluent limitations and monitoring requirements only apply at Outfall when effluent from Outfall 13S is rerouted and discharged at the Outfall. Total PCB effluent limitations established at Outfall 13S applies when effluent from Outfall 13S is rerouted and discharged at Outfall 03A027.

*3 Effluent limitations take effective on the date of three years from the effective date of the permit.

*4 Critical dilution of 23% (with a dilution series of 10%, 13%, 17%, 23%, and 31%) applies to Outfall 03A027. Also see Part II. Section G. Whole Effluent Toxicity (7-Day Chronic Testing). The WET test should occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, the test should occur as soon as possible.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALLS 03A048

Discharge Type: Intermittent
03A048: Latitude 35°52'11"N, Longitude 106°15'45"W (TA-53-964 & 979)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Los Alamos Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Arsenic	0.013	0.013	***	***	1/Year	Grab
Total Selenium (µg/l)	5.0	5.0	***	***	3/Week	Grab
Dissolved Copper	***	0.0233 (*2)	***	***	1/Year	Grab
Total Mercury (µg/l)	***	0.77 (*2)	***	***	1/Year	Grab
Dissolved Mercury (µg/l)	***	1.4 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	7.592 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from tbe effective date of the permit.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A160

Discharge Type: Intermittent
Outfall 03A160: Latitude 35°51'47"N, Longitude 106°17'49"W (TA35-124)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Ten Site Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Arsenic	0.013	0.018	***	***	1/Year	Grab
Total Copper	0.021	0.032	***	***	3/Week	Grab
Total Cyanide (μg/l)	Report	Report	***	***	1/Month	Grab
Total Recoverable Aluminum	***	4.290 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A199

Outfall 03A199: Latitude 35°52'33"N, Longitude 106°19'19"W (TA3-1837)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Record
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Recoverable Aluminum	***	0.9889 (*2)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Total Mercury	***	0.77 µg/l (*2)	***	***	1/Year	Grab
Dissolved Mercury	***	0.77 µg/l (*2)	***	***	1/Year	Grab
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

B. COMPLIANCE SCHEDULES

All effluent limitations with a compliance schedule established in Part I., section A. above, must comply with the following reporting requirements and compliance schedules:

1. Provide semi-annual progress reports by August 31 for the period of January – June, and by February 28 for the period of July – December;

2. Identify sources or causes of exceedance of permit limitations by six months from the effective date of the permit;

3. Identify corrective measures or study plan by one year from the effective date of the permit;

4. Comply with the final effluent limitations by the date specified in Part I. section A. of the permit.

C. REPORTING OF MONITORING RESULTS (MAJOR DISCHARGERS)

Monitoring information shall be submitted as specified in Part III.D.4 of this permit and shall be submitted monthly.

1. Reporting periods shall end on the last day of the month.

2. The permittee is required to submit regular monthly reports as described above no later than the 28th day of the month following each reporting period.

The permittee shall report all overflows with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary). Any noncompliance which may endanger health or the environment shall be made to the EPA at the following e-mail address: R6_NPDES_Reporting@epa.gov, as soon as possible, but within 24-hours from the time the permittee becomes aware of the circumstance. This language supersedes that contained in Part III.D.7 of the Permit. Additionally, oral notification shall also be to the New Mexico Environment Department at (505) 827-0187 as soon as possible, but within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows which endanger health or the environment shall be provided to EPA and the New Mexico Environment Department, within 5 days of the time the permittee becomes aware of the circumstance.

D. APPLICATION

A complete copy of application with original officer signature for permit renewal shall be sent to EPA and either a paper copy or an electronic copy shall be sent to New Mexico Environment Department (NMED) at the mailing address listed in Part III of this permit.

E. EFFLUENT CHARACTERISTIC ANALYSIS (Outfalls 051, 05A055 and 04A022)

During the term of this permit, if a discharge occurs at Outfall 051, Outfall 05A055 or Outfall 04A022, at the minimum of an one-time discharge effluent grab sample shall be taken for effluent characteristic analysis from the associated outfall as soon as practical. Effluent sample(s) shall be analyzed for pollutants listed in the New Mexico Water Quality Standards, 20.6.4 NMAC, section 900.J(2) Table of Numeric Criteria, which have at least one of the following criteria: irrigation, livestock watering, wildlife habitat, acute/chronic aquatic life, or persistent human health-organism only (HH-OO) criteria. The permittee shall report analytical results to EPA within 30 days when full results become available.

PART II - OTHER CONDITIONS

A. MINIMUM QUANTIFICATION LEVEL (MQL)

If any individual analytical test result is less than the minimum quantification level listed in the Appendix A to this permit, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40CFR136. For any pollutant for which the permittee determines an effluent specific MDL, the permittee shall send to the EPA Region 6 NPDES Permits Branch (6WQ-P) a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that the effluent specific MDL was correctly calculated. An effluent specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

$$MQL = 3.3 \times MDL$$

Upon written approval by the EPA Region 6 NPDES Permits Branch (6WQ-P), the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) reporting requirements.

B. 24-HOUR ORAL REPORTING

Under the provisions of Part III.D.7.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported to EPA at the following e-mail address:
R6_NPDES_Reporting@epa.gov and orally to the New Mexico Environment Department at (505) 827-0187, within 24 hours from the time the permittee becomes aware of the violation followed by a written report in five days.

Arsenic, Copper, Selenium, Zinc, Cyanide, TRC, and PCBs.

The permittee shall report all overflows with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary). Any noncompliance which may endanger health or the environment shall be made to the EPA at the following e-mail address: R6_NPDES_Reporting@epa.gov, as soon as possible, but within 24-hours from the time the permittee becomes aware of the circumstance. This language supersedes that contained in Part III.D.7 of the Permit. Additionally, oral notification shall also be to the New Mexico Environment Department at (505) 827-0187 as soon as possible, but within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows which endanger health or the environment shall be provided to EPA and the New Mexico Environment Department, within 5 days of the time the permittee becomes aware of the circumstance."

C. COMPOSITE SAMPLING

1. STANDARD PROVISIONS

Unless otherwise specified in this permit, the term "24-hour composite sample" means a sample consisting of a minimum of three (3) aliquots of effluent collected at regular intervals over a normal 24-hour operating period and combined in proportion to flow or a sample continuously collected in proportion to flow over a normal 24-hour operating period.

2. VOLATILE COMPOUNDS

For the "24-hour composite" sampling of volatile compounds using EPA Methods 601, 602, 603, 624, 1624, or any other 40 CFR 136 method approved after the effective date of the permit, the permittee shall manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. These aliquots must be combined in the laboratory to represent the composite sample of the discharge. One of the following alternative methods shall be used to composite these aliquots.

a. Each aliquot is poured into a syringe. The plunger is added, and the volume in the syringe is adjusted to 1-1/4 ml. Each aliquot (1-1/4 ml.) is injected into the purging chamber of the purge and trap system. After four (4) injections (total 5 ml.), the chamber is purged. Only one analysis or run is required since the aliquots are combined prior to analysis.

b. Chill the four (4) aliquots to 4 Degrees Centigrade. These aliquots must be of equal volume. Carefully pour the contents of each of the four aliquots into a 250-500 ml. flask which is chilled in a wet ice bath. Stir the mixture gently with a clean glass rod while in the ice bath. Carefully fill two (2) or more clean 40 ml. zero head-space vials from the flask and dispose of the remainder of the mixture. Analyze one of the aliquots to determine the concentration of the composite sample. The remaining aliquot(s) are replicate composite samples that can be analyzed if desired or necessary.

c. Alternative sample compositing methods may be used following written approval by EPA Region 6.

The individual samples resulting from application of these compositing methods shall be analyzed following the procedures specified for the selected test method. The resulting analysis shall be reported as the daily composite concentration.

As an option to the above compositing methods, the permittee may manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. A separate analysis shall be conducted for each discrete grab sample following the approved test methods. The determination of daily composite concentration shall be the arithmetic average (weighted by flow) of all grab samples collected during the 24-hour sampling period.

3. 3-HOUR COMPOSITE SAMPLE

The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

D. CO-PERMITTEES

The Los Alamos National Security (LANS) and the U.S. Department of Energy (DOE) are co-permittees for the Los Alamos National Laboratory (LANL) NPDES permit. EPA may take enforcement actions as appropriate against either LANS or DOE or both.

E. REOPENER CLAUSE

The permit may be reopened and modified during the life of the permit, in accordance with provisions in 40 CFR 122.62.

The permit may also be reopened and modified if the U.S. Fish and Wildlife Service determines that more stringent permit conditions are necessary to protect federally listed endangered species.

F. TEST METHODS

The following methods may be used for analysis under this permit:

Methods Listed in 40 CFR 136.3

EPA Methods 1668A or later revision.

EPA Methods 904.0 and 903.1

Nitroaromatics and Nitramines by High Performance Liquids Chromatography: SW846 Method 8330 or 8330A.

Microwave Digestion: SW846 Method 3015

SW 846 Method 7742

Hot Plate Digestion: EPA Method 200.2

G. WHOLE EFFLUENT TOXICITY TESTING (7-DAY CHRONIC NOEC FRESHWATER)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S): See Part I

REPORTED ON DMR AS FINAL OUTFALL: See Part I

CRITICAL DILUTION (%): Outfall 03A027 - 23%
Other Outfalls - 100%

EFFLUENT DILUTION SERIES (%):
Outfall 03A027 - 10%, 13%, 17%, 23%, 31%
Other Outfalls - 32%, 42%, 56%, 75%, 100%

COMPOSITE SAMPLE TYPE: Defined at PART I

TEST SPECIES/METHODS: 40 CFR Part 136

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA-821-R-02-013, or the most recent update thereof. This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (Fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA-821-R-02-013, or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is herein defined as the greatest effluent dilution at and below which toxicity that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution. Chronic sub-lethal test failure is defined as a demonstration of a statistically significant sub-lethal effect (i.e., growth or reproduction) at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

2. PERSISTENT LETHAL and/or SUB-LETHAL EFFECTS

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal and/or sub-lethal effects at or below the critical dilution. The purpose of additional tests (also referred to as 'retests' or confirmation tests) is to determine the duration of a toxic event. A test that meets all test acceptability criteria and demonstrates significant toxic effects does not need additional confirmation. Such testing cannot confirm or disprove a previous test result.

If any valid test demonstrates significant lethal or sub-lethal effects to a test species at or below the critical dilution, the frequency of testing for that species is automatically increased to once per quarter for the life of the permit.

a. Part I Testing Frequency Other Than Monthly

i. The permittee shall conduct a total of three (3) additional tests for any species that demonstrates significant toxic effects at or below the critical dilution. The additional tests shall be conducted monthly during the next three consecutive months. If testing on a quarterly basis, the permittee may substitute one of the additional tests in lieu of one routine toxicity test. A full report shall be prepared for each test required by this section in accordance with procedures outlined in Item 4 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.

ii. IF LETHAL EFFECTS HAVE BEEN DEMONSTRATED If any of the additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest. A TRE may be also be required due to a demonstration of-intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

iii. IF ONLY SUB-LETHAL EFFECTS HAVE BEEN DEMONSTRATED If any two of the three additional tests demonstrates significant sub-lethal effects at 75% effluent or lower, the permittee shall initiate the Sub-Lethal Toxicity Reduction Evaluation (TRE_{SL}) requirements as specified in Item 5 of this section. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the Sub-Lethal Effects TRE initiation date will be the test completion date of the first failed retest. A TRE may be also be required for failure to perform the required retests.

iv. The provisions of Item 2.a.i. are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution. A TRE may also be required due to a demonstration of intermittent lethal and/or sub-lethal effects at or below the critical dilution, or for failure to perform the required retests.

3. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

i. The toxicity test control (0% effluent) must have survival equal to or greater than 80%.

ii. The mean number of *Ceriodaphnia dubia* neonates produced per surviving female in the control (0% effluent) must be 15 or more.

iii. 60% of the surviving control females must produce three broods.

iv. The mean dry weight of surviving Fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.

v. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the *Ceriodaphnia dubia* reproduction test; the growth and survival endpoints of the Fathead minnow test.

vi. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the young of surviving females in the *Ceriodaphnia dubia* reproduction test; the growth and survival endpoints of the Fathead minnow test.

vii. A Percent Minimum Significant Difference (PMSD) range of 13 - 47 for *Ceriodaphnia dubia* reproduction;

viii. A PMSD range of 12 - 30 for Fathead minnow growth.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

i. For the *Ceriodaphnia dubia* survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/821/R-02-013 or the most recent update thereof.

ii. For the *Ceriodaphnia dubia* reproduction test and the Fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/821/R-02-013 or the most recent update thereof.

iii. If the conditions of Test Acceptability are met in Item 3.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report a survival NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

(A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

(B) the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);

(C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and

(D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

ii. The permittee shall collect second and third composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iii. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 4 of this section.

v. MULTIPLE OUTFALLS: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in item 1.a. above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.

4. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/821/R-02-013, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported on the DMR during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the LOWEST lethal and sub-lethal effects results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for EPA review.

c. The permittee shall submit the results of each valid toxicity test on the subsequent monthly DMR for that reporting period in accordance with PART III.D.4 of this permit, as follows below. Submit retest information clearly marked as such with the following month's DMR. Only results of valid tests are to be reported on the DMR.

i. *Pimephales promelas* (Fathead Minnow)

If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP6C

Report the NOEC value for survival, Parameter No. TOP6C

Report the Lowest Observed Effect Concentration (LOEC) value for survival, Parameter No. TXP6C

Report the NOEC value for growth, Parameter No. TPP6C

Report the LOEC value for growth, Parameter No. TYP6C

If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP6C

Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C

ii. *Ceriodaphnia dubia*

(A) If the NOEC for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0'_ for Parameter No. TLP3B

(B) Report the NOEC value for survival, Parameter No. TOP3B

(C) Report the LOEC value for survival, Parameter No. TXP3B

(D) Report the NOEC value for reproduction, Parameter No. TPP3B

(E) Report the LOEC value for reproduction, Parameter No. TYP3B

(F) If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP3B

(G) Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B

d. Enter the following codes on the DMR for retests only:

For retest number 1, Parameter 22415, enter a '1' if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a '0'

For retest number 2, Parameter 22416, enter a '1' if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a '0'

For retest number 3, Parameter 51443, enter a '1' if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a '0'

5. TOXICITY REDUCTION EVALUATIONS (TREs)

TREs for lethal and sub-lethal effects are performed in a very similar manner. EPA Region 6 is currently addressing TREs as follows: a sub-lethal TRE (TRE_{SL}) is triggered based on three sub-lethal test failures while a lethal effects TRE (TRE_L) is triggered based on only two test failures for lethality. In addition, EPA Region 6 will consider the magnitude of toxicity and use flexibility when considering a TRE_{SL} where there are no effects at effluent dilutions of less than 76% effluent.

a. Within ninety (90) days of confirming persistent toxicity, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The goal of the TRE is to maximally reduce the toxic effects of effluent at the critical dilution and includes the following:

i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents 'Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures' (EPA-600/6-91/003) and 'Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I' (EPA-600/6-91/005F), or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents 'Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity' (EPA/600/R-92/080) and 'Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity' (EPA/600/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 48 hours of test initiation, each composite sample shall be analyzed independently.

Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).

A. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.

B. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:

any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;

any studies/evaluations and results on the treatability of the facility's effluent toxicity; and

any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution.

A copy of the TRE Activities Report shall also be submitted to the state agency.

d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the state agency.

e. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

6. MONITORING FREQUENCY REDUCTION

a. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for one or both test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution. If granted, the monitoring frequency for that test species may be reduced to not less than once per year for the less sensitive species (usually the Fathead minnow) and not less than twice per year for the more sensitive test species (usually the *Ceriodaphnia dubia*).

b. CERTIFICATION - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in item 3.a. above. In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub-lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the agency will issue a letter of confirmation of the monitoring frequency reduction. A copy of the letter will be forwarded to the agency's Permit Compliance System section to update the permit reporting requirements.

c. SUB-LETHAL OR SURVIVAL FAILURES - If any test fails the survival or sub-lethal endpoint at any time during the life of this permit, three monthly retests are required and the monitoring frequency for the affected test species shall be increased to once per quarter until the permit is re-issued. Monthly retesting is not required if the permittee is performing a TRE.

Any monitoring frequency reduction granted applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.

H. WHOLE EFFLUENT TOXICITY TESTING (48-HOUR ACUTE NOEC FRESHWATER)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	13S
REPORTED ON DMR AS FINAL OUTFALL:	13S
CRITICAL DILUTION (%):	100%
EFFLUENT DILUTION SERIES (%):	32%, 42%, 56%, 75%, 100%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA-821-R-02-012, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Acute test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

2. PERSISTENT LETHALITY

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal effects at or below the critical dilution. Significant lethal effects are herein defined as a statistically significant difference at the 95% confidence

level between the survival of the appropriate test organism in a specified effluent dilution and the control (0% effluent). The purpose of additional tests (also referred to as 'retests' or confirmation tests) is to determine the duration of a toxic event. A test that meets all test acceptability criteria and demonstrates significant toxic effects does not need additional confirmation.
Such testing cannot confirm or disprove a previous test result.

If any valid test demonstrates significant lethal effects to a test species at or below the critical dilution, the frequency of testing for this species is automatically increased to once per quarter with no option for frequency reduction.

a. Part I Testing Frequency Other Than Monthly

i. The permittee shall conduct a total of three (3) additional tests for any species that demonstrates significant lethal effects at or below the critical dilution. The additional tests shall be conducted monthly during the next three consecutive months. If testing on a quarterly basis, the permittee may substitute one of the additional tests in lieu of one routine toxicity test. A full report shall be prepared for each test required by this section in accordance with procedures outlined in Item 4 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.

ii. If any of the additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest. A TRE may be also be required due to a demonstration of intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

iii. The provisions of Item 2.a are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution. A TRE may also be required due to a demonstration of intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

3. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

i. Each toxicity test control (0% effluent) must have a survival equal to or greater than 90%.

ii. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: Daphnia pulex survival test.

iii. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal effects are exhibited for: Daphnia pulex survival test.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

For the Daphnia pulex survival test, the statistical analyses used to determine if there is a statistically significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA-821-R-02-012 or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 3.a above and the percent survival of the test organism is equal to or greater than 90% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

(A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

(B) the test indicating receiving water toxicity has been carried out to completion (i.e., 48 hours);

(C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and

(D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect two flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

ii. The permittee shall collect a second composite sample for use during the 24-hour renewal of each dilution concentration for both tests. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 36 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

iii. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 4 of this section.

4. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this Part in accordance with the Report Preparation Section of EPA-821-R-02-012, for every valid or invalid toxicity test initiated, whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported on the DMR during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only <u>ONE</u> set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the <u>LOWEST</u> Survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for EPA review.

c. The permittee shall report the following results of each valid toxicity test on the subsequent monthly DMR for that reporting period in accordance with

PART III.D.4 of this permit. Submit retest information clearly marked as such with the following month's DMR. Only results of valid tests are to be reported on the DMR.

i. Daphnia pulex

(A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D

(B) Report the NOEC value for survival, Parameter No. TOM3D.

(C) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQM3D.

d. Enter the following codes on the DMR for retests only:

i. For retest number 1, Parameter 22415, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

ii. For retest number 2, Parameter 22416, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

5. TOXICITY REDUCTION EVALUATION (TRE)

a. Within ninety (90) days of confirming lethality in the retests, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The TRE Action Plan shall lead to the successful elimination of effluent toxicity at the critical dilution and include the following:

i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity

Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA-600/6-91/003) or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600-/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 24 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).

b. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.

c. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:

i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;

ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and

iii. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution.

A copy of the TRE Activities Report shall also be submitted to the state agency.

d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the state agency.

e. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

I. WHOLE EFFLUENT TOXICITY LIMITS (48-HOUR ACUTE NOEC FRESHWATER)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	051
REPORTED ON DMR AS FINAL OUTFALL:	051
CRITICAL DILUTION (%):	100%
EFFLUENT DILUTION SERIES (%):	32%, 42%, 56%, 75%, 100%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA-821-R-02-012, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Acute test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

d. Test failure is defined as a demonstration of statistically significant lethal effects to a test species at or below the effluent critical dilution.

e. This permit does not establish requirements to automatically increase the WET testing frequency after a test failure, or to begin a toxicity reduction evaluation (TRE) in the event of multiple test failures. However, upon failure of any WET test, the permittee must report the test results to NMED, Surface Water Quality Bureau, in writing, within 5 business days of notification the test failure. NMED will review the test results and determine the appropriate action necessary, if any.

2. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

i. Each toxicity test control (0% effluent) must have a survival equal to or greater than 90%.

ii. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent).

iii. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal effects are exhibited.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

The statistical analyses used to determine if there is a statistically significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA-821-R-02-012 or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 2.a above and the percent survival of the test organism is equal to or greater than 90% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the reporting requirements found in Item 3 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

(A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

(B) the test indicating receiving water toxicity has been carried out to completion (i.e., 48 hours);

(C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and

(D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect two flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

ii. The permittee shall collect a second composite sample for use during the 24-hour renewal of each dilution concentration for the tests. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 36 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

iii. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 3 of this section.

3. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this Part in accordance with the Report Preparation Section of EPA-821-R-02-012, for every valid or invalid toxicity test initiated, whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded for each reporting period. The data submitted should reflect the LOWEST Survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached for EPA review.

c. The permittee shall report the following results of each valid toxicity test. Submit retest information, if required, clearly marked as such. Only results of valid tests are to be reported.

i. Daphnia pulex

(A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D.

(B) Report the NOEC value for survival, Parameter No. TOM3D.

(C) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQM3D.

d. If retests are required by NMED, enter the following codes:

i. For retest number 1, Parameter 22415, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

ii. For retest number 2, Parameter 22416, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

APPENDIX A of PART II

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thalllium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury *1	0.0005 0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Clorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
	BASE/NEUTRAL		
Acenaphthene	10	Dimethyl Phthalate	10
Anthracene	10	Di-n-Butyl Phthalate	10
Benzidine	50	2,4-Dinitrotoluene	10
Benzo(a)anthracene	5	1,2-Diphenylhydrazine	20
Benzo(a)pyrene	5	Fluoranthene	10
3,4-Benzofluoranthene	10	Fluorene	10
Benzo(k)fluoranthene	5	Hexachlorobenzene	5
Bis(2-chloroethyl)Ether	10	Hexachlorobutadiene	10
Bis(2-chloroisopropyl)Ether	10	Hexachlorocyclopentadiene	10
Bis(2-ethylhexyl)Phthalate	10	Hexachloroethane	20
Butyl Benzyl Phthalate	10	Indeno(1,2,3-cd)Pyrene	5
2-Chloronapthalene	10	Isophorone	10
Chrysene	5	Nitrobenzene	10
Dibenzo(a,h)anthracene	5	n-Nitrosodimethylamine	50
1,2-Dichlorobenzene	10	n-Nitrosodi-n-Propylamine	20
1,3-Dichlorobenzene	10	n-Nitrosodiphenylamine	20
1,4-Dichlorobenzene	10	Pyrene	10
3,3'-Dichlorobenzidine	5	1,2,4-Trichlorobenzene	10
Diethyl Phthalate	10		
	PESTICIDES AND PCBS		
Aldrin	0.01	Beta-Endosulfan	0.02
Alpha-BHC	0.05	Endosulfan sulfate	0.02
Beta-BHC	0.05	Endrin	0.02
Gamma-BHC	0.05	Endrin Aldehyde	0.1
Chlordane	0.2	Heptachlor	0.01
4,4'-DDT and derivatives	0.02	Heptachlor Epoxide	0.01
Dieldrin	0.02	PCBs *2	—
Alpha-Endosulfan	0.01	Toxaphene	0.3

(MQL's Revised November 1, 2007)

Footnotes:

*1 Default MQL for Mercury is 0.005 unless Part I of your permit requires the more sensitive Method 1631 (Oxidation / Purge and Trap / Cold vapor Atomic Fluorescence Spectrometry), then the MQL shall be 0.0005.

*2 Detectable levels defined in Method 1668 must be used. MQL should be equal to or less than 0.00064 µg/l.

PART III - STANDARD CONDITIONS FOR NPDES PERMITS

A. GENERAL CONDITIONS

1. INTRODUCTION
In accordance with the provisions of 40 CFR Part 122.41, et. seq., this permit incorporates by reference ALL conditions and requirements applicable to NPDES Permits set forth in the Clean Water Act, as amended, (hereinafter known as the "Act") as well as ALL applicable regulations.

2. DUTY TO COMPLY
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. TOXIC POLLUTANTS

   a. Notwithstanding Part III.A.5, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.

   b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

4. DUTY TO REAPPLY
If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated at 40 CFR Part 122.6 and any subsequent amendments.

5. PERMIT FLEXIBILITY
This permit may be modified, revoked and reissued, or terminated for cause in accordance with 40 CFR 122.62-64. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. PROPERTY RIGHTS
This permit does not convey any property rights of any sort, or any exclusive privilege.

7. DUTY TO PROVIDE INFORMATION
The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. CRIMINAL AND CIVIL LIABILITY
Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to 18 U.S.C. Section 1001.

9. OIL AND HAZARDOUS SUBSTANCE LIABILITY
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

10. STATE LAWS
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

11. SEVERABILITY
The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

B. PROPER OPERATION AND MAINTENANCE

1. NEED TO HALT OR REDUCE NOT A DEFENSE
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent.

2. DUTY TO MITIGATE
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. PROPER OPERATION AND MAINTENANCE

a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by permittee as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants and will achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

b. The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.

4. BYPASS OF TREATMENT FACILITIES

a. BYPASS NOT EXCEEDING LIMITATIONS
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts III.B.4.b. and 4.c.

b. NOTICE

(1)ANTICIPATED BYPASS
If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2)UNANTICIPATED BYPASS
The permittee shall, within 24 hours, submit notice of an unanticipated bypass as required in Part III.D.7.

c. PROHIBITION OF BYPASS

(1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

(c) The permittee submitted notices as required by Part III.B.4.b.

(2) The Director may allow an anticipated bypass after considering its adverse effects, if the Director determines that it will meet the three conditions listed at Part III.B.4.c(1).

5. UPSET CONDITIONS

a. EFFECT OF AN UPSET
An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Part III.B.5.b. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. CONDITIONS NECESSARY FOR A DEMONSTRATION OF UPSET
A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated;

(3) The permittee submitted notice of the upset as required by Part III.D.7; and,

(4) The permittee complied with any remedial measures required by Part III.B.2.

c. BURDEN OF PROOF
In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. REMOVED SUBSTANCES
Unless otherwise authorized, solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. PERCENT REMOVAL (PUBLICLY OWNED TREATMENT WORKS)
For publicly owned treatment works, the 30-day average (or Monthly Average) percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent unless otherwise authorized by the permitting authority in accordance with 40 CFR 133.103.

C. MONITORING AND RECORDS

1. INSPECTION AND ENTRY
The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by the law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

2. REPRESENTATIVE SAMPLING
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. RETENTION OF RECORDS
The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time.

4. RECORD CONTENTS
Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) and time(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

5. MONITORING PROCEDURES

a. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.

b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.

c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

6. FLOW MEASUREMENTS
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.

D. REPORTING REQUIREMENTS

1. PLANNED CHANGES

a. INDUSTRIAL PERMITS
The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b); or,

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements listed at Part III.D.10.a.

b. MUNICIPAL PERMITS
Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. ANTICIPATED NONCOMPLIANCE
The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. TRANSFERS
This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. DISCHARGE MONITORING REPORTS AND OTHER REPORTS
Monitoring results must be reported to EPA on either the electronic or paper Discharge Monitoring Report (DMR) approved formats. Monitoring results can be submitted electronically in lieu of the paper DMR Form. To submit electronically, access the NetDMR website at www.epa.gov/netdmr and contact the R6NetDMR.epa.gov in-box for further instructions. Until you

are approved for Net DMR, you must report on the Discharge Monitoring Report (DMR) Form EPA. No. 3320-1 in accordance with the "General Instructions" provided on the form. No additional copies are needed if reporting electronically, however when submitting paper form EPA No. 3320-1, the permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA at the address below. Duplicate copies of paper DMR's and all other reports shall be submitted to the appropriate State agency (ies) at the following address (es):

EPA:
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

New Mexico:
Program Manager
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
1190 Saint Francis Drive
Santa Fe, NM 87502-5469

5. ADDITIONAL MONITORING BY THE PERMITTEE
If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased monitoring frequency shall also be indicated on the DMR.

6. AVERAGING OF MEASUREMENTS
Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

7. TWENTY-FOUR HOUR REPORTING

a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain the following information:

(1) A description of the noncompliance and its cause;

(2) The period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and,

(3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. The following shall be included as information which must be reported within 24 hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and,

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part II (industrial permits only) of the permit to be reported within 24 hours.

c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

8. OTHER NONCOMPLIANCE
The permittee shall report all instances of noncompliance not reported under Parts III.D.4 and D.7 and Part I.B (for industrial permits only) at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.7.

9. OTHER INFORMATION
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

10. CHANGES IN DISCHARGES OF TOXIC SUBSTANCES
All existing manufacturing, commercial, mining, and silvacultural permittees shall notify the Director as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) One hundred micrograms per liter (100 µg/L);
(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2, 4-dinitro-phenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Director.

b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/L);

(2) One milligram per liter (1 mg/L) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Director.

11. SIGNATORY REQUIREMENTS
All applications, reports, or information submitted to the Director shall be signed and certified.

a. ALL PERMIT APPLICATIONS shall be signed as follows:

(1) FOR A CORPORATION - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(a)A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or,

(b)The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) FOR A PARTNERSHIP OR SOLE PROPRIETORSHIP - by a general partner or the proprietor, respectively.

(3) FOR A MUNICIPALITY, STATE, FEDERAL, OR OTHER PUBLIC AGENCY - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(a)The chief executive officer of the agency, or

(b)A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

b. ALL REPORTS required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental

matters for the company. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and,

(3) The written authorization is submitted to the Director.

c. CERTIFICATION
Any person signing a document under this section shall make the following 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."

12. AVAILABILITY OF REPORTS
Except for applications, effluent data permits, and other data specified in 40 CFR 122.7, any information submitted pursuant to this permit may be claimed as confidential by the submitter. If no claim is made at the time of submission, information may be made available to the public without further notice.

E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

1. CRIMINAL

a. NEGLIGENT VIOLATIONS
The Act provides that any person who negligently violates permit conditions implementing Section 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

b. KNOWING VIOLATIONS
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. KNOWING ENDANGERMENT
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both.

d. FALSE STATEMENTS
The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the Clean Water Act)

2. CIVIL PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $27,500 per day for each violation.

3. ADMINISTRATIVE PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

a. CLASS I PENALTY
Not to exceed $11,000 per violation nor shall the maximum amount exceed $27,500.

b. CLASS II PENALTY
Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

F. DEFINITIONS

All definitions contained in Section 502 of the Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:

1. ACT means the Clean Water Act (33 U.S.C. 1251 et. seq.), as amended.

2. ADMINISTRATOR means the Administrator of the U.S. Environmental Protection Agency.

3. APPLICABLE EFFLUENT STANDARDS AND LIMITATIONS means all state and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards or performance, toxic effluent standards and prohibitions, and pretreatment standards.

4. APPLICABLE WATER QUALITY STANDARDS means all water quality standards to which a discharge is subject under the Act.

5. BYPASS means the intentional diversion of waste streams from any portion of a treatment facility.

6. DAILY DISCHARGE means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the sampling day. "Daily discharge" determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day.

7. DAILY MAXIMUM discharge limitation means the highest allowable "daily discharge" during the calendar month.

8. DIRECTOR means the U.S. Environmental Protection Agency Regional Administrator or an authorized representative.

9. ENVIRONMENTAL PROTECTION AGENCY means the U.S. Environmental Protection Agency.

10. GRAB SAMPLE means an individual sample collected in less than 15 minutes.

11. INDUSTRIAL USER means a non-domestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.

12. MONTHLY AVERAGE (also known as DAILY AVERAGE) discharge limitations means the highest allowable average of "daily discharge(s)" over a calendar month, calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes daily average concentration effluent limitations or conditions, the daily average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily concentration, F = daily flow, and n = number of daily samples; daily average discharge =

$$\frac{C_1F_1 + C_2F_2 + \ldots + C_nF_n}{F_1 + F_2 + \ldots + F_n}$$

13. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Act.

14. SEVERE PROPERTY DAMAGE means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

15. SEWAGE SLUDGE means the solids, residues, and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff that are discharged to or otherwise enter a publicly owned treatment works.

16. TREATMENT WORKS means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Act, or necessary to recycle or reuse water at

the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extension, improvement, remodeling, additions, and alterations thereof.

17. UPSET means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

18. FOR FECAL COLIFORM BACTERIA, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.

19. The term "MGD" shall mean million gallons per day.

20. The term "mg/L" shall mean milligrams per liter or parts per million (ppm).

21. The term "µg/L" shall mean micrograms per liter or parts per billion (ppb).

22. MUNICIPAL TERMS

   a. 7-DAY AVERAGE or WEEKLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The 7-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.

   b. 30-DAY AVERAGE or MONTHLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The 30-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.

   c. 24-HOUR COMPOSITE SAMPLE consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.

   d. 12-HOUR COMPOSITE SAMPLE consists of 12 effluent portions collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.

   e. 6-HOUR COMPOSITE SAMPLE consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

   f. 3-HOUR COMPOSITE SAMPLE consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

MINOR - SEWAGE SLUDGE REQUIREMENTS

INSTRUCTIONS TO PERMITTEES

Select only those Elements and Sections which apply to your sludge reuse or disposal practice.

The sludge conditions <u>do not apply</u> to wastewater treatment lagoons where sludge is not wasted for final reuse/disposal. If the sludge is not removed, the permittee shall indicate on the DMR "No Discharge".

Although reporting is not required at this time, this permit may be modified or revoked and reissued to require an annual DMR.

ELEMENT 1 - LAND APPLICATION

SECTION I: Page 2 - Requirements Applying to <u>All</u> Sewage Sludge Land Application

SECTION II: Page 6 - Requirements Specific to Bulk Sewage Sludge for Application to the Land Meeting Class A or B Pathogen Reduction and the Cumulative Loading Rates in Table 2, or Class B Pathogen Reduction and the Pollutant Concentrations in Table 3

SECTION III: Page 9 - Requirements Specific to Bulk Sewage Sludge Meeting Pollutant Concentrations in Table 3 and Class A Pathogen Reduction Requirements

SECTION IV: Page 10 - Requirements Specific to Sludge Sold or Given Away in a Bag or Other Container for Application to the Land that does not Meet the Pollutant Concentrations in Table 3

ELEMENT 2 - SURFACE DISPOSAL

SECTION I: Page 11 - Requirements Applying to <u>All</u> Sewage Sludge Surface Disposal

SECTION II: Page 15 - Requirements Specific to Surface Disposal Sites <u>Without</u> a Liner and Leachate Collection System

SECTION III: Page 17 - Requirements Specific to Surface Disposal Sites <u>With</u> a Liner and Leachate Collection System

ELEMENT 3 - MUNICIPAL SOLID WASTE LANDFILL DISPOSAL

SECTION I: Page 18 - Requirements Applying to <u>All</u> Municipal Solid Waste Landfill Disposal Activities

ELEMENT 1 - LAND APPLICATION

SECTION I. REQUIREMENTS APPLYING TO ALL SEWAGE SLUDGE LAND APPLICATION

A. General Requirements

1. The permittee shall handle and dispose of sewage sludge in accordance with Section 405 of the Clean Water Act and all other applicable Federal regulations to protect public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants which may be present in the sludge.

2. If requirements for sludge management practices or pollutant criteria become more stringent than the sludge pollutant limits or acceptable management practices in this permit, or control a pollutant not listed in this permit, this permit may be modified or revoked and reissued to conform to the requirements promulgated at Section 405(d)(2) of the Clean Water Act. If new limits for Molybdenum are promulgated prior to permit expiration, than those limits shall become directly enforceable.

3. In all cases, if the person (permit holder) who prepares the sewage sludge supplies the sewage sludge to another person for land application use or to the owner or lease holder of the land, the permit holder shall provide necessary information to the parties who receive the sludge to assure compliance with these regulations.

4. The permittee shall give prior notice to EPA (Chief, Permits Branch, Water Management Division, Mail Code 6W-P, EPA Region 6, 1445 Ross Avenue, Dallas, Texas 75202) of any planned changes in the sewage sludge disposal practice, in accordance with 40 CFR Part 122.41(l)(1)(iii). These changes may justify the application of permit conditions that are different from or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR Part 122.62(a)(1).

B. Testing Requirements

1. Sewage sludge shall not be applied to the land if the concentration of the pollutants exceed the pollutant concentration criteria in Table 1. The frequency of testing for pollutants in Table 1 is found in Element 1, Section I.C.

TABLE 1

Pollutant	Ceiling Concentration (milligrams per kilogram)*
Arsenic	75
Cadmium	85
Chromium	3000
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
PCBs	49
Selenium	100
Zinc	7500

* Dry weight basis

2. Pathogen Control

All sewage sludge that is applied to agricultural land, forest, a public contact site, or a reclamation site shall be treated by either the Class A or Class B pathogen requirements. Sewage sludge that is applied to a lawn or home garden shall be treated by the Class A pathogen requirements. Sewage sludge that is sold or given away in a bag shall be treated by Class A pathogen requirements.

a. Six alternatives are available to demonstrate compliance with Class A sewage sludge. All 6 options require either the density of fecal coliform in the sewage sludge be less than 1000 Most Probable Number (MPN) per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge be less than three MPN per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to the land. Below are the additional requirements necessary to meet the definition of a Class A sludge. Alternatives 5 and 6 are not authorized to demonstrate compliance with Class A sewage sludge in Texas permits.

Alternative 1 - The temperature of the sewage sludge that is used or disposed shall be maintained at a specific value for a period of time. See 503.32(a)(3)(ii) for specific information.

Alternative 2 - The pH of the sewage sludge that is used or disposed shall be raised to above 12 and shall remain above 12 for 72 hours.

The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

At the end of the 72 hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50 percent.

Alternative 3 - The sewage sludge shall be analyzed for enteric viruses prior to pathogen treatment. The limit for enteric viruses is one Plaque-forming Unit per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 503.32(a)(5)(ii) for specific information. The sewage sludge shall be analyzed for viable helminth ova prior to pathogen treatment. The limit for viable helminth ova is less than one per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 503.32(a)(5)(iii) for specific information.

Alternative 4 - The density of enteric viruses in the sewage sludge shall be less than one Plaque-forming Unit per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed or at the time the sludge is prepared for sale or give away in a bag or other container for application to the land.

The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed or at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land.

Alternative 5 - Sewage sludge shall be treated by one of the Processes to Further Reduce Pathogens (PFRP) described in 503 Appendix B. PFRPs include composting, heat drying, heat treatment, and thermophilic aerobic digestion.

Alternative 6 - Sewage sludge shall be treated by a process that is equivalent to a Process to Further Reduce Pathogens, if individually approved by the Pathogen Equivalency Committee representing the EPA.

b. Three alternatives are available to demonstrate compliance with Class B sewage sludge. Alternatives 2 and 3 are not authorized to demonstrate compliance with Class B sewage sludge in Texas permits.

Alternative 1 - (i) Seven random samples of the sewage sludge shall be collected for one monitoring episode at the time the sewage sludge is used or disposed.

(ii) The geometric mean of the density of fecal coliform in the samples collected shall be less than either 2,000,000 MPN per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

Alternative 2 - Sewage sludge shall be treated in one of the Processes to significantly Reduce

Pathogens described in 503 Appendix B.

Alternative 3 - Sewage sludge shall be treated in a process that is equivalent to a PSRP, if individually approved by the Pathogen Equivalency Committee representing the EPA.

In addition, the following site restrictions must be met if Class B sludge is land applied:

i. Food crops with harvested parts that touch the sewage sludge/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of sewage sludge.

ii. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of sewage sludge when the sewage sludge remains on the land surface for 4 months or longer prior to incorporation into the soil.

iii. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than 4 months prior to incorporation into the soil.

iv. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of sewage sludge.

v. Animals shall not be allowed to graze on the land for 30 days after application of sewage sludge.

vi. Turf grown on land where sewage sludge is applied shall not be harvested for 1 year after application of the sewage sludge when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.

vii. Public access to land with a high potential for public exposure shall be restricted for 1 year after application of sewage sludge.

viii. Public access to land with a low potential for public exposure shall be restricted for 30 days after application of sewage sludge.

3. Vector Attraction Reduction Requirements

All bulk sewage sludge that is applied to agricultural land, forest, a public contact site, or a reclamation site shall be treated by one of the following alternatives 1 through 10 for Vector Attraction Reduction. If bulk sewage sludge is applied to a home garden, or bagged sewage sludge is applied to the land, only alternative 1 through alternative 8 shall be used.

Alternative 1 - The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.

Alternative 2 - If Alternative 1 cannot be met for an anaerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. Volatile solids must be reduced by less than 17 percent to demonstrate compliance.

Alternative 3 - If Alternative 1 cannot be met for an aerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge with a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. Volatile solids must be reduced by less than 15 percent to demonstrate compliance.

Alternative 4 - The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.

Alternative 5 - Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of the sewage sludge shall be higher than 45 degrees Celsius.

Alternative 6 - The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

Alternative 7 - The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Alternative 8 - The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Alternative 9 - (i) Sewage sludge shall be injected below the surface of the land.

(ii) No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.

(iii) When sewage sludge that is injected below the surface of the land is Class A with respect to pathogens, the sewage sludge shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

Alternative 10 - (i) Sewage sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application to or placement on the land.

(ii) When sewage sludge that is incorporated into the soil is Class A with respect to pathogens, the sewage sludge shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

C. Monitoring Requirements

All other pollutants shall be monitored at the frequency shown below:

Amount of sewage sludge* (metric tons per 365 day period)	Frequency
0 ≤ Sludge < 290	Once/Year
290 ≤ Sludge < 1,500	Once/Quarter
1,500 ≤ Sludge < 15,000	Once/Two Months

15,000 ≤ Sludge Once/Month

- Either the amount of bulk sewage sludge applied to the land or the amount of sewage sludge received by a person who prepares sewage sludge that is sold or given away in a bag or other container for application to the land (dry weight basis).

Representative samples of sewage sludge shall be collected and analyzed in accordance with the methods referenced in 40 CFR 503.8(b).

SECTION II. REQUIREMENTS SPECIFIC TO BULK SEWAGE SLUDGE FOR APPLICATION TO THE LAND MEETING CLASS A or B PATHOGEN REDUCTION AND THE CUMULATIVE LOADING RATES IN TABLE 2, OR CLASS B PATHOGEN REDUCTION AND THE POLLUTANT CONCENTRATIONS IN TABLE 3

For those permittees meeting Class A or B pathogen reduction requirements and that meet the cumulative loading rates in Table 2 below, or the Class B pathogen reduction requirements and contain concentrations of pollutants below those listed in Table 3 found in Element I, Section III, the following conditions apply:

1. Pollutant Limits

Table 2

Pollutant	Cumulative Pollutant Loading Rate (kilograms per hectare)
Arsenic	41
Cadmium	39
Chromium	3000
Copper	1500
Lead	300
Mercury	17
Molybdenum	Monitor
Nickel	420
Selenium	100
Zinc	2800

2. Pathogen Control

All bulk sewage sludge that is applied to agricultural land, forest, a public contact site, a reclamation site, or lawn or home garden shall be treated by either Class A or Class B pathogen reduction requirements as defined above in Element 1, Section I.B.3.

3. Management Practices

a. Bulk sewage sludge shall not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen, or snow-covered so that the bulk sewage sludge enters a wetland or other waters of the U.S., as defined in 40 CFR 122.2, except as provided in a permit issued pursuant to section 404 of the CWA.

b. Bulk sewage sludge shall not be applied within 10 meters of a water of the U.S.

c. Bulk sewage sludge shall be applied at or below the agronomic rate in accordance with recommendations from the following references:

i. STANDARDS 1992, Standards, Engineering Practices and Data, 39th Edition (1992) American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085-9659.

ii. National Engineering Handbook Part 651, Agricultural Waste Management Field Handbook

(1992), P.O. Box 2890, Washington, D.C. 20013.

iii. Recommendations of local extension services or Soil Conservation Services.

iv. Recommendations of a major University's Agronomic Department.

d. An information sheet shall be provided to the person who receives bulk sewage sludge sold or given away. The information sheet shall contain the following information:

i. The name and address of the person who prepared the sewage sludge that is sold or given away in a bag or other container for application to the land.

ii. A statement that application of the sewage sludge to the land is prohibited except in accordance with the instructions on the label or information sheet.

iii. The annual whole sludge application rate for the sewage sludge that does not cause any of the cumulative pollutant loading rates in Table 2 above to be exceeded, unless the pollutant concentrations in Table 3 found in Element I, Section III below are met.

4. Notification requirements

a. If bulk sewage sludge is applied to land in a State other than the State in which the sludge is prepared, written notice shall be provided prior to the initial land application to the permitting authority for the State in which the bulk sewage sludge is proposed to be applied. The notice shall include:

i. The location, by either street address or latitude and longitude, of each land application site.

ii. The approximate time period bulk sewage sludge will be applied to the site.

iii. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who prepares the bulk sewage sludge.

iv. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who will apply the bulk sewage sludge.

b. The permittee shall give 60 days prior notice to the Director of any change planned in the sewage sludge practice. Any change shall include any planned physical alterations or additions to the permitted treatment works, changes in the permittee's sludge use or disposal practice, and also alterations, additions, or deletions of disposal sites. These changes may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional disposal sites not reported during the permit application process
or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR 122.62(a)(1).

c. The permittee shall provide the location of all existing sludge disposal/use sites to the State Historical Commission within 90 days of the effective date of this permit. In addition, the permittee shall provide the location of any new disposal/use site to the State Historical Commission prior to use of the site.

The permittee shall within 30 days after notification by the State Historical Commission that a specific sludge disposal/use area will adversely effect a National Historic Site, cease use of such area.

5. Recordkeeping Requirements - The sludge documents will be retained on site at the same location as other NPDES records.

The person who prepares bulk sewage sludge or a sewage sludge material shall develop the following information and shall retain the information for <u>five years</u>. If the permittee supplies the sludge to another person who land applies the sludge, the permittee shall notify the land applier of the requirements for recordkeeping found in 40 CFR 503.17 for persons who land apply.

a. The concentration (mg/Kg) in the sludge of each pollutant listed in Table 3 found in Element I, Section III and the applicable pollutant concentration criteria (mg/Kg), <u>or</u> the applicable cumulative pollutant loading rate and the applicable cumulative pollutant loading rate limit (kg/ha) listed in Table 2 above.

b. A description of how the pathogen reduction requirements are met (including site restrictions for Class B sludges, if applicable).

c. A description of how the vector attraction reduction requirements are met.

d. A description of how the management practices listed above in Section II.3 are being met.

e. The recommended agronomic loading rate from the references listed in Section II.3.c. above, as well as the actual agronomic loading rate shall be retained.

f. A description of how the site restrictions in 40 CFR Part 503.32(b)(5) are met for each site on which Class B bulk sewage sludge is applied.

g. The following certification statement:

"I certify, under penalty of law, that the management practices in §503.14 have been met for each site on which bulk sewage sludge is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

h. A certification statement that all applicable requirements (specifically listed) have been met, and that the permittee understands that there are significant penalties for false certification including fine and imprisonment. See 40 CFR 503.17(a)(4)(i)(B) or 40 CFR Part 503.17(a)(5)(i)(B) as applicable to the permittees sludge treatment activities.

i. The permittee shall maintain information that describes future geographical areas where sludge may be land applied.

j. The permittee shall maintain information identifying site selection criteria regarding land application sites not identified at the time of permit application submission.

k. The permittee shall maintain information regarding how future land application sites will be managed.

The person who prepares bulk sewage sludge or a sewage sludge material shall develop the following information and shall retain the information <u>indefinitely</u>. If the permittee supplies the sludge to another person who land applies the sludge, the permittee shall notify the land applier of the requirements for recordkeeping found in 40 CFR 503.17 for persons who land apply.

a. The location, by either street address or latitude and longitude, of each site on which sludge is applied.

b. The number of hectares in each site on which bulk sludge is applied.

c. The date and time sludge is applied to each site.

d. The cumulative amount of each pollutant in kilograms/hectare listed in Table 2 applied to each site.

e. The total amount of sludge applied to each site in metric tons.

f. The following certification statement:

"I certify, under penalty of law, that the requirements to obtain information in §503.12(e)(2) have been met for each site on which bulk sewage sludge is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the requirements to obtain information have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

g. A description of how the requirements to obtain information in §503.12(e)(2) are met.

6. Reporting Requirements - None.

SECTION III. REQUIREMENTS SPECIFIC TO BULK OR BAGGED SEWAGE SLUDGE MEETING POLLUTANT CONCENTRATIONS IN TABLE 3 AND CLASS A PATHOGEN REDUCTION REQUIREMENTS

For those permittees with sludge that contains concentrations of pollutants below those pollutant limits listed in Table 3 for bulk or bagged (containerized) sewage sludge and also meet the Class A pathogen reduction requirements, the following conditions apply (Note: All bagged sewage sludge must be treated by Class A pathogen reduction requirements.):

1. Pollutant limits - The concentration of the pollutants in the municipal sewage sludge is at or below the values listed.

Table 3

Pollutant	Monthly Average Concentration (milligrams per kilogram)*
Arsenic	41
Cadmium	39
Chromium	1200
Copper	1500
Lead	300
Mercury	17
Molybdenum	Monitor
Nickel	420
Selenium	36
Zinc	2800

* Dry weight basis

2. Pathogen Control

All bulk sewage sludge that is applied to agricultural land, forest, a public contact site, a reclamation site, or lawn or home garden shall be treated by the Class A pathogen reduction requirements as defined above in Element I, Section I.B.3. All bagged sewage sludge must be treated by Class A pathogen reduction requirements.

3. Management Practices - None.

4. Notification Requirements - None.

5. Recordkeeping Requirements - The permittee shall develop the following information and shall retain the information for five years. The sludge documents will be retained on site at the same location as other NPDES records.

a. The concentration (mg/Kg) in the sludge of each pollutant listed in Table 3 and the applicable pollutant concentration criteria listed in Table 3.

b. A certification statement that all applicable requirements (specifically listed) have been met, and that the permittee understands that there are significant penalties for false certification including fine and imprisonment. See 503.17(a)(1)(ii) or 503.17(a)(3)(i)(B), whichever applies to the permittees sludge treatment activities.

c. A description of how the Class A pathogen reduction requirements are met.

d. A description of how the vector attraction reduction requirements are met.

6. Reporting Requirements - None.

SECTION IV. REQUIREMENTS SPECIFIC TO SLUDGE SOLD OR GIVEN AWAY IN A BAG OR OTHER CONTAINER FOR APPLICATION TO THE LAND THAT DOES NOT MEET THE MINIMUM POLLUTANT CONCENTRATIONS

1. Pollutant Limits

Table 4

Pollutant	Annual Pollutant Loading Rate (kilograms per hectare per 365 day period)
Arsenic	2
Cadmium	1.9
Chromium	150
Copper	75
Lead	15
Mercury	0.85
Molybdenum	Monitor
Nickel	21
Selenium	5
Zinc	140

2. Pathogen Control

All sewage sludge that is sold or given away in a bag or other container for application to the land shall be treated by the Class A pathogen requirements as defined above in Section I.B.3.a. above.

3. Management Practices

Either a label shall be affixed to the bag or other container in which sewage sludge that is sold or given away for application to the land, or an information sheet shall be provided to the person who receives sewage sludge sold or given away in an other container for application to the land. The label or information sheet shall contain the following information:

a. The name and address of the person who prepared the sewage sludge that is sold or given away in a bag or other container for application to the land.

b. A statement that application of the sewage sludge to the land is prohibited except in accordance with the instructions on the label or information sheet.

c. The annual whole sludge application rate for the sewage sludge that will not cause any of the annual pollutant loading rates in Table 4 above to be exceeded.

4. Notification Requirements - None.

5. Recordkeeping Requirements - The sludge documents will be retained on site at the same location as other NPDES records.

The person who prepares sewage sludge or a sewage sludge material shall develop the following information and shall retain the information for five years.

a. The concentration in the sludge of each pollutant listed above in found in Element I, Section I, Table 1.

b. The following certification statement found in §503.17(a)(6)(iii).

"I certify, under penalty of law, that the management practice in §503.14(e), the Class A pathogen requirement in §503.32(a), and the vector attraction reduction requirement in (insert vector attraction reduction option) have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practice, pathogen requirements, and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

c. A description of how the Class A pathogen reduction requirements are met.

d. A description of how the vector attraction reduction requirements are met.

e. The annual whole sludge application rate for the sewage sludge that does not cause the annual pollutant loading rates in Table 4 to be exceeded. See Appendix A to Part 503 - Procedure to Determine the Annual Whole Sludge Application Rate for a Sewage Sludge.

6. Reporting Requirements - None.

ELEMENT 2- SURFACE DISPOSAL

SECTION I. REQUIREMENTS APPLYING TO ALL SEWAGE SLUDGE SURFACE DISPOSAL

A. General Requirements

1. The permittee shall handle and dispose of sewage sludge in accordance with Section 405 of the Clean Water Act and all other applicable Federal regulations to protect public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants which may be present.

2. If requirements for sludge management practices or pollutant criteria become more stringent than the sludge pollutant limits or acceptable management practices in this permit, or control a pollutant not listed in this permit, this permit may be modified or revoked and reissued to conform to the requirements promulgated at Section 405(d)(2) of the Clean Water Act.

3. In all cases, if the person (permit holder) who prepares the sewage sludge supplies the sewage sludge to another person (owner or operator of a sewage sludge unit) for disposal in a surface disposal site, the permit holder shall provide all necessary information to the parties who receive the sludge to assure compliance with these regulations.

4. The permittee shall give prior notice to EPA (Chief, Permits Branch, Water Management Division, Mail Code 6W-P, EPA Region 6, 1445 Ross Avenue, Dallas, Texas 75202) of any planned changes in the sewage sludge disposal practice, in accordance with 40 CFR Part 122.41(l)(1)(iii). These changes may justify the application of permit conditions that are different from or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR Part 122.62(a)(1).

5. The permittee or owner/operator shall submit a written closure and post closure plan to the permitting authority 180 days prior to the closure date. The plan shall include the following information:

(a) A discussion of how the leachate collection system will be operated and maintained for three years after the surface disposal site closes if it has a liner and leachate collection system.

(b) A description of the system used to monitor continuously for methane gas in the air in any structures within the surface disposal site. The methane gas concentration shall not exceed 25% of the lower explosive limit for methane gas for three years after the sewage sludge unit closes. A description of the system used to monitor for methane gas in the air at the property line of the site shall be included. The methane gas concentration at the surface disposal site property line shall not exceed the lower explosive limit for methane gas for three years after the sewage sludge unit closes.

(c) A discussion of how public access to the surface disposal site will be restricted for three years after it closes.

B. Management Practices

1. An active sewage sludge unit located within 60 meters of a fault that has displacement in Holocene time shall close by March 22, 1994.

2. An active sewage sludge unit located in an unstable area shall close by March 22, 1994.

3. An active sewage sludge unit located in a wetland shall close by March 22, 1994.

4. Surface disposal shall not restrict the flow of the base 100-year flood.

5. The run-off collection system for an active sewage sludge unit shall have the capacity to handle run-off from a 25-year, 24-hour storm event.

6. A food crop, feed crop, or a fiber crop shall not be grown on a surface disposal site.

7. Animals shall not be grazed on a surface disposal site.

8. Public access shall be restricted on the active surface disposal site and for three years after the site closes.

9. Placement of sewage sludge shall not contaminate an aquifer. This shall be demonstrated through one of the following:

   (a) Results of a ground-water monitoring program developed by a qualified ground-water scientist.

   (b) A certification by a qualified ground-water scientist may be used to demonstrate that sewage sludge placed on an active sewage sludge unit does not contaminate an aquifer.

10. When a cover is placed on an active surface disposal site, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit for methane gas during the period that the sewage sludge unit is active. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit for methane gas during the period that the sewage sludge unit is active. Monitoring shall be continuous.

C. Testing Requirements

1. Sewage sludge shall be tested at the frequency show below in Element 2, Section I.D. for PCBs. Any sludge exceeding a concentration of 50 mg/Kg shall not be surface disposed.

2. Pathogen Control

All sewage sludge that is disposed of in a surface disposal site shall be treated by either the Class A or Class B pathogen requirements unless sewage sludge is placed on an active surface disposal site, and is covered with soil or other material at the end of each operating day.

(a) Six alternatives are available to demonstrate compliance with Class A sewage sludge. All 6 alternatives require either the density of fecal coliform in the sewage sludge be less than 1000 MPN per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to the land. Below are the additional requirements necessary to meet the definition of a Class A sludge. Alternatives 5 and 6 are not authorized to demonstrate compliance with Class A sewage sludge in Texas permits.

Alternative 1 - The temperature of the sewage sludge that is used or disposed shall be maintained at a specific value for a period of time. See 503.32(a)(3)(ii) for specific information.

Alternative 2 - The pH of the sewage sludge that is used or disposed shall be raised to above 12 and shall remain above 12 for 72 hours.

The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

At the end of the 72 hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50 percent.

Alternative 3 - The sewage sludge shall be analyzed for enteric viruses prior to pathogen treatment. The limit for enteric viruses is one Plaque-forming Unit per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 503.32(a)(5)(ii) for specific information. The sewage sludge shall be analyzed for viable helminth ova prior to pathogen treatment. The limit for viable helminth ova is less than one per four grams of total solids (dry weight basis) either before or following pathogen treatment. See 503.32(a)(5)(iii) for specific information.

Alternative 4 - The density of enteric viruses in the sewage sludge shall be less than one Plaque-forming Unit per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed or at the time the sludge is prepared for sale or give away in a bag or other container for application to the land.

The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed or at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land.

Alternative 5 - Sewage sludge shall be treated by one of the Processes to Further Reduce Pathogens (PFRP) described in 503 Appendix B. PFRPs include composting, heat drying, heat treatment, and thermophilic aerobic digestion.

Alternative 6 - Sewage sludge shall be treated by a process that is equivalent to a Process to Further Reduce Pathogens, if individually approved by the Pathogen Equivalency Committee representing the EPA.

(b) Four alternatives are available to demonstrate compliance with Class B sewage sludge. Alternatives 2, 3, and 4 are not authorized to demonstrate compliance with Class B sewage sludge in Texas permits.

Alternative 1 - (i) Seven random samples of the sewage sludge shall be collected for one monitoring episode at the time the sewage sludge is used or disposed.

(ii) The geometric mean of the density of fecal coliform in the samples collected shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

Alternative 2 - Sewage sludge shall be treated in one of the Processes to significantly Reduce Pathogens described in 503 Appendix B.

Alternative 3 - Sewage sludge shall be treated in a process that is equivalent to a PSRP, if individually approved by the Pathogen Equivalency Committee representing the EPA.

Alternative 4 - Sewage sludge placed on an active surface disposal site is covered with soil or other material at the end of each operating day.

3. Vector Attraction Reduction Requirements

All sewage sludge that is disposed of in a surface disposal site shall be treated by one of the following alternatives 1 through 11 for Vector Attraction Reduction.

Alternative 1 - The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.

Alternative 2 - If Alternative 1 cannot be met for an anaerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. Volatile solids must be reduced by less than 17 percent to demonstrate compliance.

Alternative 3 - If Alternative 1 cannot be met for an aerobically digested sludge, demonstration can be made by digesting a portion of the previously digested sludge with a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. Volatile solids must be reduced by less than 15 percent to demonstrate compliance.

Alternative 4 - The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.

Alternative 5 - Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of the sewage sludge shall be higher than 45 degrees Celsius.

Alternative 6 - The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

Alternative 7 - The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or an anaerobic treatment process.

Alternative 8 - The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials. Unstabilized solids are defined as organic materials in sewage sludge that have not been treated in either an aerobic or an anaerobic treatment process.

Alternative 9 - (i) Sewage sludge shall be injected below the surface of the land.

(ii) No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.

(iii) When sewage sludge that is injected below the surface of the land is Class A with respect to pathogens, the sewage sludge shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

Alternative 10 - (i) Sewage sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application to or placement on the land.

(ii) When sewage sludge that is incorporated into the soil is Class A with respect to pathogens, the sewage sludge shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

Alternative 11 - Sewage sludge placed on an active sewage sludge unit shall be covered with soil or other material at the end of each operating day.

4. Methane Gas Control Within a Structure On Site

When cover is placed on an active surface disposal site, the methane gas concentration in the air in any structure shall not exceed 25% of the lower explosive limit (LEL) for methane gas during the period that the disposal site is active.

5. Methane Gas Control at Property Line

The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the LEL for methane gas during the period that the disposal site is active.

D. Monitoring Requirements

Methane Gas in covered structures on site - Continuous

Methane Gas at property line - Continuous

All other pollutants shall be monitored at the frequency shown below:

Amount of sewage sludge* (metric tons per 365 day period)	Frequency
0 ≤ Sludge < 290	Once/Year
290 ≤ Sludge < 1,500	Once/Quarter
1,500 ≤ Sludge < 15,000	Once/Two Months
15,000 ≤ Sludge	Once/Month

* Amount of sewage sludge placed on an active sewage sludge unit (dry weight basis).

Representative samples of sewage sludge shall be collected and analyzed in accordance with the methods referenced in 40 CFR 503.8(b).

SECTION II. REQUIREMENTS SPECIFIC TO SURFACE DISPOSAL SITES WITHOUT A LINER AND LEACHATE COLLECTION SYSTEM.

1. Pollutant limits - Sewage sludge shall not be applied to a surface disposal site if the concentration of the listed pollutants exceed the corresponding values based on the surface disposal site boundary to the property line distance:

TABLE 5

Unit boundary to property line distance (meters)	Pollutant Concentrations* Arsenic (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	PCB's (mg/kg)
0 to less than 25	30	200	210	49
25 to less than 50	34	220	240	49
50 to less than 75	39	260	270	49
75 to less than 100	46	300	320	49
100 to less than 125	53	360	390	49
125 to less than 150	62	450	420	49
≥ 150	73	600	420	49

* Dry weight basis

2. Management practices - Listed in Section I.B. above.

3. Notification requirements

   a. The permittee shall assure that the owner of the surface disposal site provide written notification to the subsequent site owners that sewage sludge was placed on the land.

   b. The permittee shall provide the location of all existing sludge disposal/use sites to the State Historical Commission within 90 days of the effective date of this permit. In addition, the permittee shall provide the location of any new disposal/use site to the State Historical Commission prior to use of the site.

      The permittee shall within 30 days after notification by the State Historical Commission that a specific sludge disposal/use area will adversely affect a National Historic Site, cease use of such area.

4. Recordkeeping requirements - The permittee shall develop the following information and shall retain the information for five years. The sludge documents will be retained on site at the same location as other NPDES records.

   a. The distance of the surface disposal site from the property line and the concentration (mg/Kg) in the sludge of each pollutant listed above in Table 5, as well as the applicable pollutant concentration criteria listed in Table 5.

   b. A certification statement that all applicable requirements (specifically listed) have been met, and that the permittee understands that there are significant penalties for false certification including fine and imprisonment. See 503.27(a)(1)(ii) or 503.27(a)(2)(ii) as applicable to the permittees sludge disposal activities.

   c. A description of how either the Class A or Class B pathogen reduction requirements are met, or whether sewage sludge placed on a surface disposal site is covered with soil or other material at the end of each operating day.

   d. A description of how the vector attraction reduction requirements are met.

   e. Results of a groundwater monitoring program developed by a qualified ground-water scientist, or a certification by a qualified groundwater scientist may be used to demonstrate that sewage sludge placed on an active sewage sludge unit does not contaminate an aquifer.

A qualified groundwater scientist is an individual with a baccalaureate or post graduate degree in the natural sciences or engineering who has sufficient training and experience in groundwater hydrology and related fields, as may be demonstrated by State registration, professional certification or completion of accredited university programs, to make sound professional judgements regarding groundwater monitoring, pollutant fate and transport, and corrective action.

5. Reporting Requirements - None.

SECTION III. <u>REQUIREMENTS SPECIFIC TO SURFACE DISPOSAL SITES WITH A LINER AND LEACHATE COLLECTION SYSTEM.</u>

1. Pollutant limits - None.

2. Management Practices - Listed in Section I.B. above.

3. Notification requirements

a. The permittee shall assure that the owner of the surface disposal site provide written notification to the subsequent owner of the site that sewage sludge was placed on the land.

b. The permittee shall provide the location of all existing sludge disposal/use sites to the State Historical Commission within 90 days of the effective date of this permit. In addition, the permittee shall provide the location of any new disposal/use site to the State Historical Commission prior to use of the site.

The permittee shall within 30 days after notification by the State Historical Commission that a specific sludge disposal/use area will adversely affect a National Historic Site, cease use of such area.

4. Recordkeeping requirements - The permittee shall develop the following information and shall retain the information for five years. The sludge documents will be retained on site at the same location as other NPDES records.

a. The following certification statement found in 503.27(a)(1)(ii).

"I certify, under penalty of law, that the pathogen requirements (define option used) and the vector attraction reduction requirements in (define option used) have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine the (pathogen requirements and vector attraction reduction requirements, if appropriate) have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

b. A description of how either the Class A or Class B pathogen reduction requirements are met or whether sewage sludge placed on a surface disposal site is covered with soil or other material at the end of each operating day.

c. A description of how the vector attraction reduction requirements are met.

d. Results of a ground-water monitoring program developed by a qualified ground-water scientist, or

A certification by a qualified ground-water scientist may be used to demonstrate that sewage sludge placed on an active sewage sludge unit does not contaminate an aquifer.

5. Reporting Requirements - None.

ELEMENT 3 - MUNICIPAL SOLID WASTE LANDFILL DISPOSAL

SECTION I. REQUIREMENTS APPLYING TO ALL SEWAGE SLUDGE DISPOSED IN A MUNICIPAL SOLID WASTE LANDFILL

1. The permittee shall handle and dispose of sewage sludge in accordance with Section 405 of the Clean Water Act and all other applicable Federal regulations to protect public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants that may be present. The permittee shall ensure that the sewage sludge meets the requirements in 40 CFR 258 concerning the quality of the sludge disposed in a municipal solid waste landfill.

2. If requirements for sludge management practices or pollutant criteria become more stringent than the sludge pollutant limits or acceptable management practices in this permit, or control a pollutant not listed in this permit, this permit may be modified or revoked and reissued to conform to the requirements promulgated at Section 405(d)(2) of the Clean Water Act.

3. If the permittee generates sewage sludge and supplies that sewage sludge to the owner or operator of a MSWLF for disposal, the permittee shall provide to the owner or operator of the MSWLF appropriate information needed to be in compliance with the provisions of this permit.

4. The permittee shall give prior notice to EPA (Chief, Permits Branch, Water Management Division, Mail Code 6W-P, EPA Region 6, 1445 Ross Avenue, Dallas, Texas 75202) of any planned changes in the sewage sludge disposal practice, in accordance with 40 CFR Part 122.41(l)(1)(iii). These changes may justify the application of permit conditions that are different from or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR Part 122.62(a)(1).

5. The permittee shall provide the location of all existing sludge disposal/use sites to the State Historical Commission within 90 days of the effective date of this permit. In addition, the permittee shall provide the location of any new disposal/use site to the State Historical Commission prior to use of the site.

   The permittee shall within 30 days after notification by the State Historical Commission that a specific sludge disposal/use area will adversely affect a National Historic Site, cease use of such area.

6. Recordkeeping requirements - The permittee shall develop the following information and shall retain the information for five years. The sludge documents will be retained on site at the same location as other NPDES records.

   a. The description and results of the tests performed, required by the owner/operator of the MSWLF to demonstrate compliance with the 40 CFR 258 regulations.

   b. A certification that sewage sludge meets the requirements in 40 CFR 258 concerning the quality of the sludge disposed in a municipal solid waste landfill unit.

7. Reporting requirements - None.

EXHIBIT
II

Sarah
LANL 28355
pink permit pro

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

DEC 1 9 2014

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (7010 2780 0002 4354 5770)

Ms. Kimberly Davis Lebak, Manager
U.S. Department of Energy
Los Alamos Field Office, MS A316
3747 West Jemez Road
Los Alamos, NM 87544

DEC 2 3 2014

Re: NPDES Permit No. NM0028355
Public Notice of Draft Permit Modification

Dear Ms. Lebak:

Please find enclosed a copy of a draft National Pollutant Discharge Elimination System (NPDES) permit modification Part I, the Environmental Protection Agency's NPDES Permits & TMDLs Branch has developed. The fact sheet explaining the basis for the permit modifications and the public notice for this permit are also enclosed. Upon final issuance, the permit will authorize the discharge of pollutants from your facility in accordance with the requirements of the Clean Water Act.

Any formal comments you wish to make should be submitted in writing by the due date stated in the public notice to Ms. Evelyn Rosborough (6WQ-N) at the above address. After all public comments have been received and carefully evaluated, the Agency will make a final permit modification decision. A copy of the final permit will be mailed to you at that time.

If you have any questions or would like to discuss any aspect of this draft permit, please feel free to contact the permit writer, Isaac Chen, at VOICE:214-665-7364, FAX:214-665-2191, or EMAIL:chen.isaac@epa.gov.

Sincerely yours,

Claudia V. Hosch
Associate Director
NPDES Permits & TMDLs Branch

Enclosures

cc (w/enclosures): New Mexico Environment Department

J.S. Environmental Protection Agen
Public Notice of Draft NPDES Permit(s)

DECEMBER 20, 2014

This is to give notice that the U.S. Environmental Protection Agency, Region 6, has formulated a Draft Permit for the following facility (facilities) under the National Pollutant Discharge Elimination System (NPDES). Development of the draft permit(s) was based on a preliminary stuff review by EPA, Region 6, and consultation with the State of New Mexico. The State of New Mexico is currently reviewing the draft permit(s). The permit(s) will become effective no sooner than 30 days after the close of the comment period unless:

A. The State of New Mexico denies certification, or requests an extension for certification prior to that date.

B. Comments received by JANUARY 19, 2015, in accordance with §124.20, a warrant a public notice of EPA's final permit decision.

C. A public hearing is held requiring delay of the effective date.

EPA's contact person for submitting written comments, requesting information regarding the draft permit, and/or obtaining copies of the permit and the Statement of Basis or Fact Sheet is:

Ms. Evelyn Rosborough
U.S. Environmental Protection Agency
Permit Processing Team (6WQ-NP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733
(214) 665-7515
rosborough.evelyn@epa.gov

EPA's comments and public hearing procedures may be found at 40 CFR 124.10 and 124.12 (48 Federal Register 14264, April 1, 1983, as amended at 49 Federal Register 38051, September 26, 1984). The comment period during which written comments on the draft permit may be submitted extends for 30 days from the date to this Notice.

Ɔuring the comment period, any interested person may request a Public Hearing by filing a written equest which must state the issues to be raised. A public hearing will be held when EPA finds a significant degree of public interest.

EPA will notify the applicant and each person who has submitted comments or requested notice of the final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke or reissue, or terminate a permit. Any person who filed comments on or participated in public hearing on the draft permit may appeal the Agency's final permit decision. However, the request must be submitted within 30 days of the date of the final permit decision and be in accordance with the requirements of 40 CFR 124.19.

Further information including the administrative record may be viewed at the above address between 8 a.m. and 4:30 p.m., Monday through Friday. It is recommended that you write or call to the contact above for an appointment, so the record(s) will be available at your convenience.

The draft permit(s) are available on the New Mexico NPDES Public Notices website at:
http://www.epa.gov/region6/water/npdes/publicnotices/nm/nmdraft.htm

AUTHORIZATION TO DISCHARGE TO WATERS OF THE UNITED STATES,
NPDES PERMIT NO. NM0028355.

The applicant's mailing address is:

U.S. Department of Energy Los Alamos Site Office
3747 West Jemez Road
Los Alamos, NM 87544

EPA proposes to modify the current permit issued August 12, 2014, with an effective date of October 1, 2014, and an expiration date of September 30, 2019. Significant changes from the current permit include:

A. Delete effluent limitations and monitoring requirements for selenium at Outfall 03A048;
B. Change flow measurement type to "estimate" for Outfalls 03A113, 03A027, 03A048, 03A160, 03A199, and 03A181;
C. Add compliance schedule for 6T3 Temperature monitoring at Outfall 001; and
D. Add effluent limitations and monitoring requirements for temperature at Outfall 001.

This permit modification public notice only opens those modified permit conditions for public comments.

State Certification

This Notice also serves as Public Notice of the intent of the New Mexico Environment Department, Surface Water Quality Bureau to consider issuing Clean Water Act (CWA) Section 401 Certification. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner that will comply with applicable New Mexico water quality standards, including the antidegradation policy, and the statewide water quality management plan. The NPDES permit will not be issued until the certification requirements of Section 401 have been met.

If you want to comment on State Certification submit written comments within the 30 day period to:

Bruce Yurdin
Manager, Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
1190 Saint Francis Drive
Santa Fe, NM 87502-5469
Phone (505) 827-2795
Fax (505) 827-0160
bruce.yurdin@state.nm.us

NPDES PERMIT NO. NM0028355
FACT SHEET

MODIFICATION OF NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

PERMITTEES:

Los Alamos National Security, LLC
Management Contractor for Operations
Los Alamos, New Mexico 87545

and

U.S. Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

ISSUING OFFICE: U.S. Environmental Protection Agency (EPA)
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

PREPARED BY: Isaac Chen
Environmental Engineer
NPDES Permits Branch (6WQ-P)
Water Quality Protection Division
VOICE: 214-665-7364
FAX: 214-665-2191
EMAIL: chen.isaac@epa.gov

PERMIT ACTION: Proposed modification of NPDES Permit No. NM0028355, issued by EPA on August 12, 2014.

DATE PREPARED: December 5, 2014

40 CFR CITATIONS: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of October 1, 2014.

STATE CERTIFICATION: The draft permit modification has been forwarded to the New Mexico Environment Department (NMED) for certification in accordance with Section 401 of the CWA and regulations promulgated at 40 CFR124.53. The draft modified permit and public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service; and to the National Marine Fisheries Service prior to publication.

I. BACKGROUND AND BASIS FOR MODIFICATION

On August 12, 2014, EPA Region 6 issued NPDES Permit No. NM0028355 ("the Permit") to co- permittees Los Alamos National Security, LLC (LANS) and the U.S. Department of Energy ("DOE") for discharges of treated wastewaters from eleven (11) outfalls located at the Los Alamos National Laboratory (LANL) facility in Los Alamos County, NM.

On September 15, 2014, LANS and DOE ("Petitioners") filed a Petition for Review of the Permit with the EPA Environmental Appeals Board (EAB) under 40 CFR 124.19(a). The petitioners' challenge that the basis for imposition of monitoring and sampling requirements for selenium at permitted Outfall 03A048 is erroneous.

By letter to the EAB dated November 21, 2014, the Region provided notice, as required by 40 CFR §§ 124.16(a)(2)(ii) and 124.60(b), of the conditions of the Permit that are uncontested and severable from the Permit conditions contested in the Petition for Review. Under 40 CFR §§ 124.16(a)(2)(i), these uncontested and severable conditions of the Permit as issued become fully effective 30 days from the date of the letter or on December 19, 2014.

EPA and the petitioners filed a joint request on October 21, 2014, to ask EAB to stay the proceedings of petition so that EPA and the petitioners may delete the contested permit conditions through Region 6's modification of the permit. Modification of the Permit will allow the parties to resolve the Petition for Review and finalize the terms and conditions of the Permit without the expense and delay of continued litigation. EPA believes the proposed modification is consistent with the CWA and federal regulations and that modification of the Permit is in the best interest of EPA, the permittees and the public.

Because permittees have also requested clarification/modification of some permit conditions in their mail and emails dated September 11, 2014, September 15, 2014, and September 24, 2014, respectively, EPA is addressing those issues here. Modification of the permit is authorized under 40 CFR 122.62.

II. CLARIFICATION/MODIFICATION REQUEST RESPONSE

A. Petition Issue

Monitoring Requirements and Effluent Limitations for Selenium at Outfall 03A048: The draft permit proposed effluent limits and corresponding monitoring requirements for selenium at Outfall 03A048 based on a determination that there was a reasonable potential (RP) for selenium to cause or contribute to an excursion above state water quality standards. During the public comment period, permittees recognized an error in the data used for the RP analysis for Outfall 03A048. Specifically, the values for selenium were reported in the renewal application using EPA Method 200.8, which method generated false positives for selenium. (A modified analytical method, SW 846 Method 7742, is authorized in the previously issued permit for reporting and compliance purposes.) Thus, EPA's RP determination for selenium at Outfall 03A048 was based on flawed data. Permittees brought the selenium false positives issue in comments on the draft permit, and submitted new split sample results indicating that selenium was not present in the samples at levels with a reasonable potential to cause or contribute to an excursion above state water quality standards. Accordingly, permittees requested that the requirements related to selenium at Outfall 03A048 be eliminated. However, when EPA recalculated the RP for selenium, EPA used both true and false data and it resulted in establishment of effluent limitations and elevated monitoring frequency of 3/week.

EPA Response: EPA took a very conservative approach by averaging all SW 846 Method 7742 and EPA Method 200.8 selenium data provided to EPA in calculation of RP during the final permit decision. While EPA cannot definitively determine that all EPA Method 200.8 was in fact false, use of suspect data is not scientific sound, so EPA decides that it should not use the EPA Method 200.8 data in permit development. Method SW 846 7742 was approved for reporting and compliance purposes in both the previous and current permits and the permittees have demonstrated no selenium RP based on data from Method SW 846 7742. Therefore, EPA proposes to remove the monitoring requirements and effluent limitations for selenium at Outfall 03A048.

B. Comment Issue:

Flow Measurements at Outfalls 03A113, 03A027, 03A048, 03A160, 03A199, and 03A181: The permittees requested to change the flow measurement type from "record" to "estimate" for Outfall 03A113, 03A027, 03A048, 03A160 and 03A199, and add the definition of "estimate" flow to all those six outfalls. EPA did not provide explanations to require flow record at those outfalls or provide the definition of "record" for those discharges.

EPA's Response: EPA proposed to change the flow measurement type from "record" to "estimate" because "estimate" type was used in the previous permit and it was likely that the "record" type was a typographical error when EPA proposed permit renewal in 2013 and EPA did not receive any comment on the issue.

Compliance Schedules for Outfall 03A048, 03A160 and 051: The permittees requested 3-year compliance schedules be established for parameters which have more stringent limitations in the new permit.

EPA's Response: While the New Mexico Water Quality Standards do allow compliance schedules, 40 CFR 122.47(a)(1) states "schedules of compliance ... shall require compliance as soon as possible" and there is no automatic three year compliance period. EPA denies the request and rationales for denial are described as below.

Outfall 03A048

Total Selenium- Effluent limitations are proposed to be removed as described above.

Total Arsenic- Changes of limitations are within 30% and the permittees should be able to comply with the new limitations with a shorter period of time than the 1/year monitoring frequency.

Outfall 03A160

Total Arsenic- The permittees should be able to comply with the new limitations with a shorter period of time than the 1/year monitoring frequency.

Total Copper- Changes of limitations are within 5% and the permittees should be able to comply with it without a compliance schedule.

Outfall 051- No discharge has occurred since 2010. The permittees can start evaluating the treatment technology and operation practices prior to next discharge.

Effluent Limitations and Monitoring Requirements at Outfall 04A022: The permittees requested clarification on the effluent limits, monitoring and reporting requirements for Outfall 04A022. The permittees commented "It is assumed that the effluent limits are established only for the once through cooling water discharge. If the intent of the Permit Writer is to have monitoring requirements for storm water and roof drain water in this permit at Outfall 04A022, then the Permittees request that only monitoring and reporting requirements (no effluent limits) be established for storm water discharges, or a 3-year compliance schedule for storm water/roof drain water will be needed to meet the permit limits for pH and TSS at Outfall 04A022 (Page 11 of Part I)." The permittees also stated "…the pH of natural rainwater in New Mexico is often < 6.0 s.u., and it is unknown if storm water/roof drain water will meet the TSS limits."

EPA's Response: All parameters, except for total residual chlorine (TRC) listed for monitoring requirements and/or effluent limitations apply to storm water and roof drain discharges; and all parameters including TRC apply to once through cooling water discharges. Because both pH and TSS limitations were retained from the previous permit and discharges of storm water/roof drain are infrequent, the permittees should be able to use the existing on-site technologies to control both pH and TSS. No compliance schedule is proposed. Flow measurement type is changed to estimate.

Effluent Limitations and Monitoring Requirements at Outfall 03A027: (1) The Permittees requested that "total PCB (ug/L) *2" be added to the effluent characteristic table for Outfall 03A027 after E. Coli to reflect the discharge limitation monitoring requirement (at Page 17 of Part I). (2) The permittees requested clarification as to whether BOD monitoring and reporting requirements apply at Outfall 03A027. (3) The Permittees also requested the WET monitoring requirement be changed to "Grab" due to the intermittent 'discharge type' of the cooling tower blowdown to this outfall and it is consistent with sample type of 'Grab' for all other parameters listed for this outfall.

EPA's Response: (1) EPA proposes to add "total PCB (ug/L) *2" to the effluent characteristic table. (2) EPA does not intent to require limit or monitoring for BOD at Outfall 03A027 in the permit issued August 12, 2014. All effluent limitations established at Outfall 03A027 are water quality-based limitations. (3) EPA proposes to change the sample type from "24-hour composite" to "3-hour composite" because a "3-hour composite" sample type was used in the previous permit. The "24-hour composite" sample type might be a typo when EPA proposed the permit renewal in 2013. The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period 3 hours of discharge.

Description of Outfall 03A113: Buildings 294, 1032, and 1038 no longer discharge to the outfall, and will not in the future. The Permittees requested the description located on Page 25 of Part I be changed to (TA-53-293 & 952).

EPA's Response: EPA proposes to change the description of Outfall 03A113 to (TA-53-293 & 952).

Effluent Limitations and Monitoring Requirements at Outfall 03A181: The permittees requested clarification on the effluent limits, monitoring and reporting requirements for Outfall 03A181. The permittees commented "It is assumed that the effluent limits are established only for the once through cooling water discharge. If the intent of the Permit Writer is to have monitoring requirements for storm water in this permit at Outfall 03A181, then the Permittees request that only monitoring and reporting requirements (no effluent limits) be established for storm water discharges, or a 3-year compliance schedule for storm water discharge will be needed to meet the permit limits for pH and TSS…." The permittees also stated "…the pH of natural rainwater in New Mexico is often < 6.0 s.u., and it is unknown if storm water will meet the TSS limits."

EPA's Response: All parameters, except for total residual chlorine (TRC) listed for monitoring requirements and/or effluent limitations apply to storm water discharges; and all parameters including TRC apply to once through cooling water discharges. Because both pH and TSS limitations were retained from the previous permit and discharges of storm water are infrequent, the permittees should be able to use the existing on-site technologies to control both pH and TSS. No changes to the permit or a compliance schedule are proposed.

Outfall 13S: The permittees stated that "Outfall 13S is located at the TA-46 Sanitary Waste Water System (SWWS) Plant and potentially discharges treated sanitary wastewater effluent to the TA-3-336 Reuse Tank for tertiary treatment at the TA-3 Sanitary Effluent Reclamation Facility (SERF) or directly to NPDES Outfall 001; or directly into Canada Del Buey. The SWWS Plant has never discharged to Canada Del Buey since beginning operations in 1992. The permittee will properly operate and maintain these facilities pursuant to Part III. B and will not discharge to Canada del Buey unless under emergency conditions. If a discharge occurs to Canada del Buey, the permittee will notify EPA pursuant to Part III.D. of the Laboratory's NPDES Permit."

EPA's Response: Comment noted. No permit changes proposed.

6T3 Temperature Monitoring at Outfall 001: The permittees in their email dated September 24, 2014, stated "…the monitoring requirement is '1/Hour, Grab (or Continuous Record)'. A compliance schedule is stated for the effluent limitation (6T3 = 20°C), but not for the monitoring requirement of 1/Hour. In the EPA response to comments, NMED stated that they recognize that new or updated temperature monitoring instrumentation and/or procedures and operational changes may be needed to meet the 6T3 temperature limitations…." Then, it continued that "Currently, there is no instrumentation to monitor temperature 1/Hour at Outfall 001. For the previous permit (temperature monitoring requirement 1/Week, Grab), monitoring was by a grab sample and a calibrated temperature probe."

EPA's Response: EPA proposes to include the 1/Hour monitoring frequency in the permit because the compliance schedule was designed to address monitoring instrumentation and operational changes. EPA also proposes to re-establish the 1/Week and grab sample type as the interim monitoring and reporting requirements for temperature.

Potential Contaminant in Sewer System: The permittees notified EPA R6's Water Enforcement Branch in the letter dated August 27, 2014, that showers and sinks used by personnel to wash off after working in the building or near areas adjacent to the high explosive (HE) facilities have potential to contain HE. Approximately 50 – 100 gallons per day of soap and wash water which may contain de minimis quantities of HE are discharged to the sanitary collection system. The permittees also stated that the basement of Building 86 was flooded and captured storm water were contaminated with oil & grease, uranium, and HE. The captured storm water would be disposed at the Sanitary Wastewater Systems Plant (SWSP) for treatment and discharge.

EPA's Response: The SWSP is not designed to treat HE waste stream and Outfall 13S or Outfall 001 is not authorized to discharge HE waste stream. It is common that workers' personnel clothing and/or body are contaminated with de minimis amount of chemicals, oil and grease, raw materials, products, by-products, and etc., and those contaminants are washed off to the sanitary collection system through washing, shower, or laundry. While LANL shall (and has done so) provide as detailed as practicable a list of potential sources of wastes in the application or addendum to the application, EPA does not believe it is necessary to include de minimis amount of HE in the description of the discharge at Outfall 13S or Outfall 001. EPA is not proposing to make any changes for Outfall 13S.

In terms of flooding water or other unexpected waste streams (e.g., collected accidental spill, firefighting water, etc,) needing to be treated at the SWSP, the permittees shall notify EPA R6's Water Enforcement Branch for monitoring requirements or discharge instructions.

III. PUBLIC COMMENT AND FINAL DETERMINATION

The proposed permit modification is open to the public for review and comment for a period of xx days from xxxx, 2014, or until xxxx, 2014 (to accommodate staggered newspaper notice of the proposed modification). In accordance with 40 CFR 122.62, only the modified parts of the permit as described below are open for comment. Anyone wishing to comment on the draft permit modification should submit their comments in writing by the close of business on June 7, 2010, to the address listed below.) Pursuant to 40 C.F.R. § 122.62, only the proposed changes from the previously issued final permit are open for comment.

Evelyn Rosborough
U.S. Environmental Protection Agency
Water Quality Protection Division
1445 Ross Ave, Suite 1200 (6WQ-NP)
Dallas, TX 75202
Rosborough.evelyn@epa.gov

Any person, prior to the close of the comment period, may submit a request in writing to EPA for a public hearing to consider the draft permit modification. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest.

Following the close of the comment period and any public hearing, if held, the Regional Administrator will issue a final permit modification decision and forward a copy of the final decision to the permittees, and send a notice to anyone who submitted written comments on the modification or requested notice.

Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

NPDES Permit No. **NM0028355**

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Los Alamos National Security, LLC Management Contractor for Operations Los Alamos, New Mexico 87544	and	U.S. Department of Energy Los Alamos Area Office Los Alamos, New Mexico 87544

are authorized to discharge from a facility located at Los Alamos,

to receiving waters named: Perennial portion of Sandia Canyon in Waterbody Segment No. 20.6.4.126, and Mortandad Canyon, Canada del Buey, Los Alamos Canyon, ephemeral portion of Sandia Canyon, Ten Site Canyon, and Canon de Valle, in Waterbody Segment No. 20.6.4.128 of the Rio Grande Basin,

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Parts I [Requirements for NPDES Permits], II [Other Conditions], III [Standard Conditions for NPDES Permits], and IV [Sewage Sludge Requirements] hereof.

This permit modification supersedes and replaces Part I – Requirements for NPDES Permits of NPDES Permit No. NM0028355 issued on August 12, 2014.

This permit modification shall become effective on

This permit and the authorization to discharge shall expire at midnight, September 30, 2019.

Issued on	Prepared by
William K. Honker, P.E. Director Water Quality Protection Division (6WQ)	Isaac Chen Environmental Engineer NPDES Permits Branch (6WQ-P)

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PART I - REQUIREMENTS FOR NPDES PERMITS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL 001

Discharge Type: Continuous
Latitude 35°52'26"N, Longitude 106°19'09"W (TA-3-22)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge Power Plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, R/O reject, floor and sink drains, and treated sanitary re-use to Sandia Canyon, and the discharge creates a perennial portion of Sandia Canyon, Segment Number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)			
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	***	***	Report	Report	Continuous	Record
TSS	30	100	Report	Report	1/Month	24-hr Composite
E. Coli (#/100 ml) (*1)	126	410	***	***	2/Month	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total Recoverable Aluminum	***	0.9889 (*3)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*3)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Temperature (°C) (*4)	20° C	20° C	***	***	1/Week	Grab
6T3 Temperature (°C)	(*5)	(*5)	***	***	1/Hour	Grab (or Continuous Record)
Total PCB (μg/l) (*6)	0.00064	0.00064	Report	Report	1/Year	24-hr Composite
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*7) (7-day Static Renewal)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ceriodaphnia dubia	Report	Report	1/5 Years	24-Hr Composite
Pimephales promelas	Report	Report	1/5 Years	24-Hr Composite

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge from Outfall 001.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

FOOTNOTES
*1 Geometric mean. Effluent limitations and monitoring requirements only apply when effluent from Outfall 13S is rerouted and discharged at Outfall 001.
*2 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*3 Effluent limitations take effective on the date of three years from the effective date of the permit.
*4 Monitoring and reporting requirements end when 6T3 Temperature limitations become effective.

*5 6T3 Temperature of 20° C (68° F) shall not be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days. The effluent limitation and monitoring requirements of 6T3 takes effective on the date one-day before the permit expiration date.

*6 EPA published congener Method 1668 Revision and detection limits shall be used. [The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).] Human health-based limitations.

*7 Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section G. Whole Effluent Toxicity (7-Day Chronic Testing).

OUTFALL 13S

Discharge Type: Continuous
Latitude 35°51'08"N, Longitude 106°16'29"W (TA-46-347)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated sanitary waste water to Sandia Canyon in Segment Numbers 20.6.4.126 via outfalls utilizing treated effluent as specified in Outfall 001 and Category 03A, or to Canada del Buey in Segment Numbers 20.6.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	Continuous	Record
BOD	30	45	73	109	1/Month	24-hr Composite
TSS	30	45	73	109	1/Month	24-hr Composite
E. Coli (#/100 ml) (*1)	548	2507	***	***	2/Month	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total PCB (μg/l) (*3,*4)	0.00064	0.000642	Report	Report	1/Year	24-hr Composite
Total Recoverable Aluminum	***	3.514 (*5)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*6)	MONTHLY AVG MINIMUM	48-HOUR MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE

(48-hr Static Renewal) Daphnia pulex	Report	Report	1/ 2-Years	24-Hr Composite

FOOTNOTES

*1 Logarithmic mean. If the wastewater is discharge at other outfall, it shall comply with effluent limitations and monitoring requirements for E. coli as established for Outfall 13S.

*2 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 If the wastewater is discharge at other outfall, it shall comply with effluent limitations and monitoring requirements for PCBs as established for Outfall 13S. EPA published congener Method 1668 Revision and detection limits shall be used for reporting purposes. The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).

*4 Human health-based limitation.

*5 Effluent limitations take effective on the date of three years from the effective date of the permit.

*6 1st sample in the 1st year of the permit and 2nd sample in the 3rd year of the permit. The WET test should occur between November 1 and March 31. If discharges are not expected to occur during this sampling period, the test should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%.
See Part II, Section H. Whole Effluent Toxicity (48-Hr Acute Testing).

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements shall be taken at the following location(s): at the flow measuring device in Canada del Buey only when a discharge occurs at the outfall.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 051 - Radioactive Liquid Waste Treatment Facility

Discharge Type: Intermittent
Latitude 35°51'54"N, Longitude 106°17'52"W (TA-50-1)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated radioactive liquid waste to Mortandad Canyon in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)			
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*5)
COD	125	125	***	***	1/Month	Grab
TSS	30	45	73	109	1/Month	Grab
Total Toxic Organics (*1)	1.0	1.0	***	***	1/Month	Grab
Ra 226+228 (pCi/l)	30	30	***	***	1/Week	Grab
Total Chromium	1.34	2.68	***	***	1/Week	Grab
Total Lead	0.076	0.115	***	***	1/Week	Grab
Total Copper	0.014	0.014	***	***	3/Week	Grab
Total Zinc	0.191	0.191	***	***	3/Week	Grab
Total Hardness	Greater than or equal to 50 mg/l				3/Week	Grab
Total Residual Chlorine	***	0.011 (*2)	***	***	1/Week	Grab
Total Cadmium	Report	Report	***	***	2/Term (*3)	Grab
Total Mercury	Report	Report	***	***	2/Term (*3)	Grab
Total Nickel	Report	Report	***	***	2/Term (*3)	Grab
Total Selenium	Report	Report	***	***	2/Term (*3)	Grab

Perchlorate	Report	Report	***	***	1/Week	Grab
Total PCB (μg/l)	Report	Report	***	***	2/Term (*3)	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium III	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
Whole Effluent Lethality (PCS 22414) (48-Hr NOEC) (*4)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	100%	100%	1/3 Months	3-Hr Composite

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*3 At least two samples from different discharge events shall be taken during the term of the permit if discharges occur. EPA published congener Metbod 1668 Revision and detection limits shall be used for reporting purposes. The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).

*4 Monitoring and reporting requirements begin on the effective date of this permit. 100% limitation becomes effective on March 1, 2016. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. Also see Part II, Section I. Whole Effluent Toxicity (48-Hour Acute Limits).

*5 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following the final treatment and prior to or at the point of discharge from TA-50-1 treatment plant.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 05A055 - High Explosives Waste Water Treatment Plant

Discharge Type: Intermittent
Latitude 35°50'49"N, Longitude 106°19'51"W (TA-16-1508)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated waste water from the high explosives waste water treatment facility to a tributary to Canon de Valle in segment number 20.6.4.128 of the Rio Grande Basin

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*4)
COD	125	125	***	***	1/Quarter	Grab
TSS	30	45	***	***	1/Quarter	Grab
Total Toxic Organics (*1)	1.0	1.0	***	***	1/Quarter	Grab
Oil and Grease	15	15	***	***	1/Quarter	Grab
Trinitrotoluene	0.02	Report	***	***	1/Quarter	Grab
Total RDX	0.20	0.66	***	***	2/Month (*2)	Grab
Perchlorate	Report	Report	***	***	1/Year	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*3) (48-Hour Static Renewal)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	Report	Report	1/5 Years	3-Hr Composite

FOOTNOTES

*1 The limits and monitoring for Total Toxic Organics do not include 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), Pesticides, or Polychlorinated biphenyls.

*2 One sample should be taken before the 15th of the month and another taken after the 15th of the month.

*3 The WET test should occur during the period of November 1 to March 31 after the effective date of the permit. If no discharge is expected during this period, testing should be taken as soon as possible. Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section H. Whole Effluent Toxicity (48-Hour Acute Testing).

*4 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 04A022

Discharge Type: Intermittent
Outfall 03A022: Latitude 35°52'14"N, Longitude 106°19'01"W (TA3-2274)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge storm water, roof drain water, and once-through cooling water for emergency use only to Mortandad Canyon, in segment number 20.6.4.128 of the Rio Grande Basin. (Cooling tower blowdown is not authorized for discharge at this outfall.)

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS CONCENTRATION (mg/L, unless stated) MONTHLY AVERAGE	DAILY MAXIMUM	LOADING (Lbs/day, unless stated) MONTHLY AVERAGE	DAILY MAXIMUM	MONITORING REQUIREMENTS FREQUENCY	SAMPLE TYPE
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*2)
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine	***	0.011	***	***	1/Week (*1)	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Term	Grab
Dissolved Copper	Report	Report	***	***	1/Term	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

Footnote

*1 When discharge of once-through cooling water for emergency purposes only.
*2 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A181

Discharge Type: Intermittent
Outfall 03A181: Latitude 35°51'50.8"N, Longitude 106°18'05"W (TA55-6)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge storm water, cooling tower blowdown and other wastewater to Mortandad Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*3)
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Dissolved Copper	***	0.0115 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	2.724 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes. TRC applies when discharges of cooling tower blowdown occur only.

*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

*3 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A113

Discharge Type: Intermittent
Outfall 03A113: Latitude 35°52'03"N, Longitude 106°15'43"W (TA-53-293 & 952)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*3)
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Dissolved Copper	***	0.0218 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	6.904 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.
*3 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALLS 03A027

Discharge Type: Intermittent
Outfall 03A027: Latitude 35°52'26"N, Longitude 106°19'08"W (TA3-2327)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*4)
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
E. Coli (#/100 ml) (*2)	548	2507	***	***	2/Month	Grab
Total PCB (μg/l) (*2)	0.00064	0.000642	Report	Report	1/Year	Grab
Total Recoverable Aluminum	***	0.9889 (*3)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*3)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
Whole Effluent Toxicity Testing (7-day Static Renewal) (*5)	MONTHLY AVG MINIMUM	7-DAY MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ceriodaphnia dubia	Report	Report	1/5 Years	3-Hr Composite (*6)
Pimephales promelas	Report	Report	1/5 Years	3-Hr Composite (*6)

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*2 Effluent limitations and monitoring requirements only apply at Outfall when effluent from Outfall 13S is rerouted and discharged at the Outfall. E. coli limitations are geometric mean. Total PCB effluent limitations established at Outfall 13S applies when effluent from Outfall 13S is rerouted and discharged at Outfall 03A027.

*3 Effluent limitations take effective on the date of three years from the effective date of the permit.

*4 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

*5 Critical dilution of 23% (with a dilution series of 10%, 13%, 17%, 23%, and 31%) applies to Outfall 03A027. Also see Part II. Section G. Whole Effluent Toxicity (7-Day Chronic Testing). The WET test should occur during the first period of November 1 to March 31 after the effective date of the permit. If no discharge occurs during this period, the test should occur as soon as possible.

*6 "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALLS 03A048

Discharge Type: Intermittent
03A048: Latitude 35°52'11"N, Longitude 106°15'45"W (TA-53-964 & 979)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Los Alamos Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*3)
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Arsenic	0.013	0.013	***	***	1/Year	Grab
Dissolved Copper	***	0.0233 (*2)	***	***	1/Year	Grab
Total Mercury (µg/l)	***	0.77 (*2)	***	***	1/Year	Grab
Dissolved Mercury (µg/l)	***	1.4 (*2)	***	***	1/Year	Grab
Total Recoverable Aluminum	***	7,592 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.
*3 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A160

Discharge Type: Intermittent
Outfall 03A160: Latitude 35°51'47"N, Longitude 106°17'49"W (TA35-124)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Ten Site Canyon, in segment number 20.6.4.128 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*3)
TSS	30	100	***	***	1/Quarter	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Arsenic	0.013	0.018	***	***	1/Year	Grab
Total Copper	0.021	0.032	***	***	3/Week	Grab
Total Cyanide (μg/l)	Report	Report	***	***	1/Month	Grab
Total Recoverable Aluminum	***	4.290 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Chromium VI	Report	Report	***	***	1/Term	Grab
pH (Standard Unit)	Range from 6.0 to 9.0		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.

*3 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

OUTFALL 03A199

Outfall 03A199: Latitude 35°52'33"N, Longitude 106°19'19"W (TA3-1837)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge cooling tower blowdown and other wastewater to Sandia Canyon, in segment number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	1/Day	Estimate (*3)
TSS	30	100	***	***	1/Quarter	Grab
Total Residual Chlorine (*1)	***	0.011	***	***	1/Week	Grab
Total Phosphorus	20	40	***	***	1/Quarter	Grab
Total Recoverable Aluminum	***	0.9889 (*2)	***	***	1/Year	Grab
Dissolved Copper	***	0.0073 (*2)	***	***	1/Year	Grab
Adjusted Gross Alpha	Report	Report	***	***	1/Term	Grab
Total Mercury	***	0.77 μg/l (*2)	***	***	1/Year	Grab
Dissolved Mercury	***	0.77 μg/l (*2)	***	***	1/Year	Grab
pH (Standard Unit)	Range from 6.6 to 8.8		***	***	1/Week	Grab

FOOTNOTES

*1 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.
*2 Effluent limitations take effective on the date of three years from the effective date of the permit.
*3 "Estimate" flow measurements shall not be subject to the accuracy provisions established at Part III.C.6. The daily flow value may be estimated using best engineering judgment.

SAMPLING LOCATION(S)
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge.

NO DISCHARGE REPORTING
If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box in the Discharge Monitoring Report.

FLOATING SOLIDS, OIL AND GREASE
There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

B. COMPLIANCE SCHEDULES

All effluent limitations with a compliance schedule established in Part I., section A. above, must comply with the following reporting requirements and compliance schedules:

1. Provide semi-annual progress reports by August 31 for the period of January – June, and by February 28 for the period of July – December;

2. Identify sources or causes of exceedance of permit limitations by six months from the effective date of the permit;

3. Identify corrective measures or study plan by one year from the effective date of the permit;

4. Comply with the final effluent limitations by the date specified in Part I. section A. of the permit.

C. REPORTING OF MONITORING RESULTS (MAJOR DISCHARGERS)

Monitoring information shall be submitted as specified in Part III.D.4 of this permit and shall be submitted monthly.

1. Reporting periods shall end on the last day of the month.

2. The permittee is required to submit regular monthly reports as described above no later than the 28th day of the month following each reporting period.

The permittee shall report all overflows with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary). Any noncompliance which may endanger health or the environment shall be made to the EPA at the following e-mail address: R6_NPDES_Reporting@epa.gov, as soon as possible, but within 24-hours from the time the permittee becomes aware of the circumstance. This language supersedes that contained in Part III.D.7 of the Permit. Additionally, oral notification shall also be to the New Mexico Environment Department at (505) 827-0187 as soon as possible, but within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows which endanger health or the environment shall be provided to EPA and the New Mexico Environment Department, within 5 days of the time the permittee becomes aware of the circumstance.

D. APPLICATION

A complete copy of application with original officer signature for permit renewal shall be sent to EPA and either a paper copy or an electronic copy shall be sent to New Mexico Environment Department (NMED) at the mailing address listed in Part III of this permit.

E. EFFLUENT CHARACTERISTIC ANALYSIS (Outfalls 051, 05A055 and 04A022)

During the term of this permit, if a discharge occurs at Outfall 051, Outfall 05A055 or Outfall 04A022, at the minimum of an one-time discharge effluent grab sample shall be taken for effluent characteristic analysis from the associated outfall as soon as practical. Effluent sample(s) shall be analyzed for pollutants listed in the New Mexico Water Quality Standards, 20.6.4 NMAC, section 900.J(2) Table of Numeric Criteria, which have at least one of the following criteria: irrigation, livestock watering, wildlife habitat, acute/chronic aquatic life, or persistent human health-organism only (HH-OO) criteria. The permittee shall report analytical results to EPA within 30 days when full results become available.

LANL 25355
pink permit process

ENVIRONMENTAL PROTECTION AGENCY
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SANTA FE, NM 87502-5469

8750285469 B015

PUBLIC NOTICE

17014

U.S. Environmental Protection Agency
Public Notice of Draft NPDES Permit(s)

DECEMBER 20, 2014

This is to give notice that the U.S. Environmental Protection Agency, Region 6, has formulated a Draft Permit for the following facility (facilities) under the National Pollutant Discharge Elimination System (NPDES). Development of the draft permit(s) was based on a preliminary stuff review by EPA, Region 6, and consultation with the State of New Mexico. The State of New Mexico is currently reviewing the draft permit(s). The permit(s) will become effective no sooner than 30 days after the close of the comment period unless:

A. The State of New Mexico denies certification, or requests an extension for certification prior to that date.

B. Comments received by JANUARY 19, 2015, in accordance with §124.20, a warrant a public notice of EPA's final permit decision.

C. A public hearing is held requiring delay of the effective date.

EPA's contact person for submitting written comments, requesting information regarding the draft permit, ıd/or obtaining copies of the permit and the Statement of Basis or Fact Sheet is:

Ms. Evelyn Rosborough
U.S. Environmental Protection Agency
Permit Processing Team (6WQ-NP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733
(214) 665-7515
rosborough.evelyn@epa.gov

EPA's comments and public hearing procedures may be found at 40 CFR 124.10 and 124.12 (48 Federal Register 14264, April 1, 1983, as amended at 49 Federal Register 38051, September 26, 1984). The comment period during which written comments on the draft permit may be submitted extends for 30 days from the date to this Notice.

uring the comment period, any interested person may request a Public Hearing by filing a written request which must state the issues to be raised. A public hearing will be held when EPA finds a significant degree of public interest.

EPA will notify the applicant and each person who has submitted comments or requested notice of the final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke or reissue, or terminate a permit. Any person who filed comments on or participated in public hearing on the draft permit may appeal the Agency's final permit decision. However, the request must be submitted within 30 days of the date of the final permit decision and be in accordance with the requirements of 40 CFR 124.19.

Further information including the administrative record may be viewed at the above address between 8 a.m. and 4:30 p.m., Monday through Friday. It is recommended that you write or call to the contact above for an appointment, so the record(s) will be available at your convenience.

The draft permit(s) are available on the New Mexico NPDES Public Notices website at:
http;//www.epa.gov/region6/water/npdes/publicnotices/nm/nmdraft.htm

AUTHORIZATION TO DISCHARGE TO WATERS OF THE UNITED STATES,
NPDES PERMIT NO. NM0028355.

The applicant's mailing address is:

U.S. Department of Energy Los Alamos Site Office
3747 West Jemez Road
Los Alamos, NM 87544

EPA proposes to modify the current permit issued August 12, 2014, with an effective date of October 1, 2014, and an expiration date of September 30, 2019. Significant changes from the current permit include:

A. Delete effluent limitations and monitoring requirements for selenium at Outfall 03A048;
B. Change flow measurement type to "estimate" for Outfalls 03A113, 03A027, 03A048, 03A160, 03A199, and 03A181;
C. Add compliance schedule for 6T3 Temperature monitoring at Outfall 001; and
D. Add effluent limitations and monitoring requirements for temperature at Outfall 001.

This permit modification public notice only opens those modified permit conditions for public comments.

State Certification

This Notice also serves as Public Notice of the intent of the New Mexico Environment Department, Surface Water Quality Bureau to consider issuing Clean Water Act (CWA) Section 401 Certification. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner that will comply with applicable New Mexico water quality standards, including the antidegradation policy, and the statewide water quality management plan. The NPDES permit will not be issued until the certification requirements of Section 401 have been met.

If you want to comment on State Certification submit written comments within the 30 day period to:

Bruce Yurdin
Manager, Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
1190 Saint Francis Drive
Santa Fe, NM 87502-5469
Phone (505) 827-2795
Fax (505) 827-0160
bruce.yurdin@state.nm.us

EXHIBIT

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

DEC 18 2015

Mr. Lindsay A. Lovejoy, Jr.
Attorney-at-law
3600 Cerrillos Road, Unit 1001A
Santa Fe, NM 87507

Re: Outfall 051, NPDES Permit NM0028355, Radioactive Liquid Waste Treatment Facility, Los Alamos, NM

Dear Mr. Lovejoy,

This letter is in response to your letter of November 13, 2015, to Mr. Ron Curry, Regional Administrator for the Environmental Protection Agency Region 6 (EPA), requesting that EPA terminate National Pollutant Discharge Elimination System (NPDES) permit coverage for the above-referenced outfall. As noted in your letter, NPDES permit No. NM0028355, issued by EPA to Los Alamos National Laboratory (LANL), includes coverage for discharges from LANL's Radioactive Liquid Waste Treatment Facility (RLWTF) through Outfall 051. There has been no discharge from Outfall 051 since 2010 and the RLWTF has been recently redesigned to eliminate all discharges. As a result, you argue that Outfall 051 does not require NPDES permit coverage, and that such coverage is improper because it would make RSWTF eligible for a Waste Water Treatment Unit (WWTU) regulatory exemption under the Resource Conservation and Recovery Act (RCRA). In addition, you argue that pursuant to federal court rulings in *National Pork Producers Council v. EPA*, 635 F.3d 738 (5th Cir. 2011)("*National Pork Producers*") and *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2d Cir. 2005)("*Waterkeeper*"), EPA has no jurisdiction to issue an NPDES permit to a facility that has no discharge. Consequently, you request that EPA terminate LANL's permit coverage for Outfall 051.

In response to your letter, we have re-examined our files regarding NPDES Permit No. NM0028355, including LANL's application for permit coverage. LANL specifically sought permit coverage for Outfall 051 to protect against liability in case of a future discharge. In its application, LANL indicated that under certain circumstances, e.g. maintenance, malfunction, and/or capacity shortage, a discharge could occur and permit authorization would be needed. Because a discharge from Outfall 051 not covered by an NPDES permit would subject LANL to liability for discharge without a permit under Section 301(a) of the Clean Water Act (CWA), EPA does not believe it is appropriate to terminate the facility's permit coverage for this Outfall without the permittee's consent. EPA generally defers to a permit requester's determination that a discharge could occur and that permit coverage is needed. It is not unusual for facilities that do not routinely discharge to seek and retain permit coverage to protect against liability in the event of an unanticipated discharge. Whether or not issuance of NPDES permit coverage might trigger the RCRA WWTU regulatory exemption has no bearing on EPA's NPDES permitting decisions, which must be based on the requirements of the CWA.

Further, we do not read *National Pork Producers Council* or *Waterkeeper* to prohibit EPA from issuing NPDES permit coverage to a facility seeking coverage to protect against liability in the event of a discharge. Each of those cases dealt with EPA's authority to **require** operators of Concentrated Animal Feeding Operations (CAFOs) to obtain NPDES permit coverage where there had not yet been a discharge – not EPA's authority to issue a permit to a facility **requesting** coverage for a possible future discharge.

For the above reasons, EPA declines to propose termination of LANL's NPDES permit coverage for Outfall 051 under NPDES Permit No. NM0028355. Should you have any question regarding this matter, please contact Mr. Brent Larsen, Chief of Permitting Section, at 214-665-7523.

Sincerely

for Stacey Dwyer
Associate Director
NPDES Permits & TMDL Branch

cc: Shelly Lemon, New Mexico Environment Department