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# **DRAFT HAZARDOUS WASTE FACILITY PERMIT**

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**Los Alamos National Laboratory**

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**Los Alamos National Laboratory**  
**Hazardous Waste Permit**

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**PART 1: GENERAL PERMIT CONDITIONS**

**1.1 PERMITTEES**

The Secretary of the New Mexico Environment Department issues this Permit for hazardous waste management at the Los Alamos National Laboratory (LANL) to the United States Department of Energy (DOE), the owner and co-operator of LANL (EPA ID Number NM 0890010515-1), and Los Alamos National Security, LLC (LANS), co-operator of LANL.

**1.2 PERMITTED ACTIVITY**

This Permit authorizes DOE and LANS (the Permittees) to manage, store, and treat hazardous waste at LANL, and establishes the general and specific standards for these activities, pursuant to the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§ 74-4-1 to 74-4-14, and the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC. This Permit also establishes standards for closure and post-closure care of permitted units at LANL pursuant to the HWA and HWMR.

**1.3 CITATIONS**

Whenever this Permit cites a provision of the 20.4.1 NMAC or the 40 CFR, the Permit shall be deemed to incorporate the citation by reference, including all subordinate provisions of the cited provision, and make binding the full text of the cited provision.

Hazardous waste management regulations are cited throughout the permit. The federal Hazardous Waste Management Regulations, 40 CFR Parts 260 through 273, are generally cited rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of this Permit, and enforcement of its terms and conditions, all references to provisions of federal regulations that have been incorporated into the State regulations shall be deemed to include the State incorporation of those provisions.

Permit terms and conditions that may potentially extend beyond requirements of other regulations are supported by 40 CFR § 270.32(b)(2).

**1.4 EFFECT OF PERMIT**

Compliance with this Permit for those management practices specifically authorized by this Permit during its term shall constitute compliance, for purposes of enforcement, with Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 *et. seq.*, and/or the HWA, and/or the implementing regulations at 40 CFR Parts 264, 266 and 268 except for those requirements that become effective by statute after the Permit has been issued (40 CFR § 270.4).

1 Compliance with this Permit shall not constitute a defense to any order issued or any action  
2 brought under: §§ 74-4-10, 74-4-10.1, or 74-4-13 of the HWA; §§ 3008(a), 3008(h), 3013,  
3 7002(a)(1)(B), or 7003 of RCRA; §§ 104, 106(a), 107, or the Comprehensive Environmental  
4 Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601 to 9671; or any other  
5 federal, state or local law providing for protection of public health or the environment.

6 This Permit does not convey any property rights of any sort or any exclusive privilege, nor  
7 authorize any injury to persons or property, any invasion of other private rights, or any  
8 infringement of state or local laws or regulations. Compliance with this Permit does not relieve  
9 Permittees from the responsibility of complying with all applicable state or federal laws and  
10 regulations (40 CFR §§ 270.4, 270.30(g), and 270.32(b)(1)).

#### 11 **1.4.1 Effect of this Permit on Interim Status Units**

12 Interim status units that the Permittees intend to permit in the future are listed in Table O-5  
13 (*Interim Status Units Actively Managing Hazardous Waste*) in Attachment O (*Hazardous Waste*  
14 *Management Units*). These interim status units will continue to operate under the interim status  
15 provisions in 40 CFR § 270.1(c)(4) and are not regulated under this Permit.

#### 16 **1.5 EFFECT OF INACCURACIES IN PERMIT APPLICATION**

17 This Permit is based on the assumption that the information submitted in the Permittees'  
18 Application is true and correct and the Facility and permitted units were constructed and will be  
19 operated and maintained as specified in the Application. The Application has numerous iterations;  
20 however this Permit is based on the most recent submittal identified as follows:

- 21 1. the Part A Application dated April 2006;
- 22 2. the General Part B Permit Application dated August 2003;
- 23 3. the TA-3-29 CMR Part B Application dated September 1999;
- 24 4. the TA-16 Part B Permit Application dated June 2003;
- 25 5. the TA-50 Part B Permit Application dated August 2002;
- 26 6. the TA-54 Part B Permit Application dated June 2003; and
- 27 7. the TA-55 Part B Permit Application dated September 2003.

28 Any inaccuracies found in the Application may be grounds for the termination, revocation and re-  
29 issuance, or modification of the Permit in accordance with 40 CFR §§ 270.41, 270.42, and 270.43  
30 which are incorporated herein by reference, and for enforcement action.

31 The Permittees shall inform the Department of any deviation from, or changes in, the information  
32 contained in the Application that would affect the Permittees' ability to comply with this Permit.  
33 The Permittees shall promptly provide this information in writing to the Department in accordance

1 with Permit Sections 1.9.14 and 1.9.15 and 40 CFR §§ 270.30(l)(11) and 270.43(a)(2), which are  
2 incorporated herein by reference.

3 Portions of the Application are incorporated into the Permit as Attachments. Any conflicting  
4 language between permit conditions and Application commitments is addressed at Permit Section  
5 1.7.2. Certain figures referenced in the Permit Parts are figures the Department has extracted from  
6 the Permittees various Application attachments and renamed.

## 7 **1.6 PERMIT ACTIONS**

### 8 **1.6.1 Duration of Permit**

9 This Permit shall be effective for a fixed term not to exceed ten (10) years from its effective date.  
10 The effective date of this Permit shall be 30 days after notice of the Department's decision has  
11 been served on the Permittees or such later time as the Department may specify (40 CFR §  
12 270.50(a)).

### 13 **1.6.2 Permit Modification**

14 This Permit may be modified for both routine and significant changes as specified in 40 CFR §§  
15 270.41 through 270.43 and any modification shall conform with the requirements specified in these  
16 regulations. The filing of a permit modification request by the Permittees, or the notification by  
17 the Permittees of planned changes or anticipated noncompliance, does not stay the applicability or  
18 enforceability of any permit condition (40 CFR § 270.30(f)).

### 19 **1.6.3 Transfer of Land Ownership**

20 The Permittees shall not transfer any land that is part of the Facility without submitting a permit  
21 modification request to the Department. The Permittees shall submit a permit modification  
22 request, in compliance with all requirements of 40 CFR § 270.42, at least 180 days prior to the  
23 proposed effective date of transfer of ownership of any land which is part of the Facility as  
24 indicated in Figure 1-1. This type of permit modification request may be submitted as a Class 3  
25 permit modification or the Permittees may request a determination that the modification is a Class  
26 1 or 2 pursuant to the requirements of 40 CFR § 270.42(d), incorporated herein by reference.

27 In addition to the requirements of 40 CFR § 270.42, a permit modification request for transfer of  
28 land ownership for part of the Facility shall do the following:

- 29 1. identify the boundaries of the land proposed for transfer by providing the Department  
30 with a boundary survey certified by a registered professional surveyor;
- 31 2. provide the new owner's name, address, telephone number, ownership status, and status  
32 as a federal, state, private, public, or other entity;
- 33 3. describe the location and identity of any existing, or prior, solid waste management unit,  
34 area of concern, or permitted unit on the land proposed for transfer;

- 1       4. describe any known or suspected presence of hazardous waste, hazardous constituents,  
2       and/or radioactive waste in soil, sediment, surface water, or groundwater at any depth  
3       within the boundaries of the land proposed for transfer;
- 4       5. describe the status of any past, present, or planned investigations or remediation of  
5       contamination of soil or groundwater at any depth within the boundaries of the land  
6       proposed for transfer;
- 7       6. comply with the requirements of Section 120(h) of the Comprehensive Environmental  
8       Response, Compensation, and Liability Act, 42 U.S.C. § 9620(h); and
- 9       7. include a revised map of the Facility (40 CFR §§ 264.101, 270.30(l)(1) and 270.42).

#### 10   **1.6.4       Permit Suspension, Termination, and Revocation and Re-Issuance**

11   This Permit may be suspended, terminated, or revoked and re-issued for cause as specified in  
12   Section 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43. The filing of a request by the  
13   Permittees for a permit modification, or the notification by the Permittees of planned changes or  
14   anticipated noncompliance, does not stay the applicability or enforceability of any Permit condition  
15   (40 CFR § 270.30(f)).

#### 16   **1.6.5       Permit Re-Application**

17   If the Permittees intend to continue an activity regulated by this Permit after the expiration date of  
18   this Permit, the Permittees shall submit a complete application for a new permit at least 180 days  
19   before the expiration date of this Permit unless permission for a later date has been granted by the  
20   Department in compliance with 40 CFR §§ 270.10(h) and 270.30(b). The Department will not  
21   grant permission for an application for a new permit that is submitted later than the expiration date  
22   of this Permit (40 CFR §§ 270.10(h)).

#### 23   **1.6.6       Continuation of Expiring Permit**

24   If the Permittees have submitted a timely and complete application for renewal of this Permit, in  
25   compliance with 40 CFR §§ 270.10 and 270.13 through 270.29 and Permit Section 1.6.5, this  
26   Permit shall remain in effect until the effective date of the new permit if, through no fault of the  
27   Permittees, the Department has not issued a new permit on or before the expiration date of this  
28   Permit (40 CFR § 270.51).

#### 29   **1.6.7       Permit Review by the Department**

30   The Department may review this Permit 5 years after the effective date of Permit issuance and may  
31   modify this Permit as necessary pursuant to Section 74-4-4.2 of the HWA and 40 CFR §§ 270.41  
32   and 270.50(b). Such modification shall not extend the effective term of this Permit. Nothing shall  
33   preclude the Department from reviewing and modifying the Permit, in accordance with applicable  
34   requirements, at any time during its term.

1 **1.7 PERMIT CONSTRUCTION**

2 **1.7.1 Severability**

3 The provisions of this Permit are severable if any provision of this Permit, or any application of  
4 any provision of this Permit, to any circumstance is held invalid the application of such provision  
5 to other circumstances and the remainder of this Permit shall not be affected thereby.

6 **1.7.2 Conflict in Language**

7 Portions of the Application are incorporated into this Permit as Attachments. The Department has  
8 modified the Application language to make it consistent in all aspects with the Permit conditions  
9 and applicable regulations. However, if there is a conflict between the language of a Permit  
10 condition and the language of the Permit Attachment, the language of the Permit condition shall  
11 control over the language in the Permit Attachment.

12 This Permit and 40 CFR Parts 264, 266, and 268 establish the minimum requirements for the  
13 design, construction, operation, and maintenance of the Facility. Any language in an Attachment,  
14 which states or implies discretion to not comply with the minimum requirements of this Permit or  
15 40 CFR § 270.32(b)(1), is not effective and the requirements of this Permit and 40 CFR §  
16 270.32(b) shall control.

17 **1.8 DEFINITIONS**

18 Terms used in this Permit shall have the same meanings as those in the HWA, RCRA, and their  
19 implementing regulations unless this Permit specifically provides otherwise. Where a term is not  
20 defined in the HWA, RCRA, implementing regulations, or this Permit, the meaning of the term  
21 shall be determined by a standard dictionary reference, EPA guidelines or publications, or the  
22 generally accepted scientific or industrial meaning of the term.

23 **Acceptable Knowledge** means generator knowledge of the process that generated a waste,  
24 including but not limited to, process knowledge, waste analysis data from generators of similar  
25 wastes, and facility records of analysis performed before the effective date of RCRA.

26 **Area of Concern (AOC)** means any area having a probable release of hazardous waste or  
27 hazardous constituents, which is not from a solid waste management unit, determined to pose a  
28 current or potential threat to human health or the environment.

29 **Compliance Order on Consent** or **Consent Order** or **Order** means the March 1, 2005 Order  
30 issued to the Permittees pursuant to New Mexico's HWA and SWA requiring the Permittees to  
31 conduct Facility-wide investigations and cleanups of contaminants released to the environment.

32 **Days** means calendar days unless otherwise specified.

33 **Department** means the New Mexico Environment Department and any successor and  
34 predecessor agencies.

1 **Disposal Unit** means any unit at the Facility at which hazardous waste is intentionally placed into  
2 or on any land or water and at which waste will remain after closure.

3 **Facility** means the Los Alamos National Laboratory site comprised of approximately 40 square  
4 miles, located on the Pajarito Plateau in Los Alamos County in north central New Mexico,  
5 approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe, and  
6 owned by the United States Department of Energy.

7 **Federal Facility Compliance Act (FFCA)** means the law passed by Congress (Pub. L. 102-386  
8 (1992), codified at 42 U.S.C. sec. 6903, 6908, 6927, 6924, 6939, 6961, and 6965) that specifies  
9 federal facilities, like LANL, are subject to all civil and administrative penalties and fines,  
10 regardless of whether such penalties or fines are punitive or coercive in nature. These penalties  
11 and fines may be levied by the EPA or an authorized state such as New Mexico. Further, it is the  
12 FFCA that requires federal facilities that generate or store mixed waste to submit a Site  
13 Treatment Plan (STP) for developing treatment capacities and technologies to treat all the  
14 facility's mixed waste to the standards required for waste subject to the land disposal  
15 prohibitions set forth in Section 3004(m) of RCRA, regardless of the time the waste was  
16 generated.

17 **Federal Facility Compliance Order (FFCO)** means the Order dated October 4, 1995 issued by the  
18 Department to DOE and LANL requiring compliance with a Site Treatment Plan (STP) to create a  
19 path forward for the treatment and off-site disposal of mixed wastes. It also exempts such wastes  
20 from the mandated regulatory one-year storage limitation.

21 **Foreign Source** means a hazardous waste source outside of the United States.

22 **Hazardous Constituent** means any constituent identified in 40 CFR Part 261 Appendix VIII or any  
23 constituent identified in 40 CFR Part 264 Appendix IX.

24 **Hazardous Waste** means a solid waste that is: 1) not excluded from regulation under 40 CFR §  
25 261.4(b); 2) is either listed in 40 CFR Part 261, Subpart D, exhibits any of the characteristics  
26 identified in 40 CFR Part 261, Subpart C, or is a mixture of solid waste; and 3) is one or more  
27 wastes listed in 40 CFR Part 261, Subpart D. However, for purposes of corrective action,  
28 "hazardous waste" shall have the meaning set forth in the HWA, Section 74-4-3(K). Hazardous  
29 waste may be a "mixed waste," which means it is waste that contains both hazardous waste subject  
30 to the HWA and RCRA, and source, special nuclear, or byproduct material subject to the Atomic  
31 Energy Act.

32 **Hazardous Waste Management Unit** means a contiguous area of land on or in which hazardous  
33 waste is placed, or the largest area in which there is significant likelihood of mixing hazardous  
34 waste constituents in the same area. Examples of hazardous waste management units include an  
35 open burn unit, a stabilization unit, a landfill, a tank and its associated piping and underlying  
36 containment system, and a container storage area. A container alone does not constitute a unit; the  
37 unit includes containers and the land or pad upon which they are placed. At LANL, hazardous  
38 waste management units include both permitted units and interim status units.

1 **Interim Status Unit** means any hazardous waste management unit that was in operation before the  
2 effective date of the statutory or regulatory amendments that caused the unit to become subject to  
3 permitting requirements, that meets the requirements for interim status under Section 3005(e) of  
4 RCRA, 42 U.S.C. § 6925(e), for which interim status has not been terminated pursuant to Section  
5 3005(e)(2) of RCRA, 42 U.S.C. § 6925(e)(2), and that has not heretofore been issued a permit by  
6 EPA or the Department.

7 **Land Disposal** means placement of waste in or on the land and includes, but is not limited to,  
8 placement in a landfill, surface impoundment, waste pile, land treatment facility, or in a concrete  
9 vault or a shaft intended for disposal purposes.

10 **Off-Site Waste** means any hazardous waste transported to the Facility from off-site but does not  
11 include intra-Facility waste.

12 **Partial Closure** means the closure of a hazardous waste management unit, or a portion of a  
13 hazardous waste management unit, in accordance with the applicable closure requirements of 40  
14 CFR Part 264 at a facility that contains other active hazardous waste management units.

15 **Permitted Unit** means a hazardous waste management unit that is: 1) actively managing waste or  
16 in closure or post-closure care; 2) addressed by this Permit; 3) not an interim status unit; and 4)  
17 listed in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units*  
18 *Actively Managing Hazardous Waste*), or Table O-2 (*Permitted Units Undergoing Post-Closure*  
19 *Care*), or Table O-4 (*Permitted Units Undergoing Closure*).

20 **Post-Closure Care Unit** means any permitted unit subject to the post-closure care requirements of  
21 40 CFR Part 264, Subpart G.

22 **Release** means any accidental or intentional spilling, leaking, pouring, emitting, emptying,  
23 discharging, injecting, pumping, escaping, leaching, or dumping of any hazardous waste or  
24 hazardous constituents inside a permitted unit or to the environment including the abandonment or  
25 discarding of barrels, containers, and other closed receptacles containing hazardous waste or  
26 hazardous constituents.

27 **Secretary** means the Secretary of the New Mexico Environment Department or his or her designee.

28 **Solid Waste Management Unit (SWMU)** means any discernable unit in which solid waste has  
29 been placed at any time and from which the Department determines there may be a risk of a  
30 release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was  
31 intended for the management of solid or hazardous waste. Such units include any area at the  
32 Facility at which solid wastes have been routinely and systematically released; they do not include  
33 one-time spills (*See* 61 Fed. Reg. 19431, 19442-43 (May 1, 1996)).

34 **Storage** means the holding of hazardous waste for a temporary period at the end of which the  
35 waste is transported off-site for either treatment or disposal.

36 **Transuranic (TRU) Waste** means waste of more than 100 nanocuries of alpha-emitting transuranic  
37 isotopes per gram of waste, with half-lives greater than 20 years, except for: 1) high-level

1 radioactive waste; 2) waste that the DOE Secretary has determined, with the concurrence of the  
2 EPA Administrator, does not need the degree of isolation required by the disposal regulations; or  
3 3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-  
4 case basis in accordance with part 61 of Title 10 Code of Federal Regulations (Pub. L. 102-579  
5 (1992)).

6 **Waste Stream** means each waste material generated from a single process or from an activity that  
7 is similar in input materials, physical form, hazardous constituents, and is distinguishable from  
8 other wastes by EPA Hazardous Waste Numbers and Land Disposal Restriction (LDR) status.

## 9 **1.9 DUTIES AND REQUIREMENTS**

### 10 **1.9.1 Duty to Comply**

11 The Permittees shall comply with all conditions in this Permit, except to the extent and for the  
12 duration such noncompliance is authorized in an emergency permit pursuant to 40 CFR § 270.61.  
13 Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation  
14 of the HWA and RCRA and is grounds for enforcement or other Department action and may  
15 subject the Permittees to:

- 16 1. an administrative or civil enforcement action, including civil penalties and injunctive  
17 relief, under §§ 74-4-10 or 74-4-10.1 of the HWA or §§ 3008(a) and (g) or 3013, 7002,  
18 7003 of RCRA;
- 19 2. permit modification, suspension, termination, revocation, or denial of a permit  
20 application or modification request under § 74-4-4.2 of the HWA;
- 21 3. a citizen suit under § 7002(a) of RCRA;
- 22 4. criminal penalties under § 74-4-11 of the HWA or §§ 3008(d), (e), and (f) of RCRA; or
- 23 5. a combination of the above (40 CFR § 270.30(a)).

### 24 **1.9.2 Enforcement**

25 Any violation of a condition in this Permit may subject the Permittees or their officers,  
26 employees, successors, and assigns to: 1) a compliance order under Section 74-4-10 of the HWA  
27 or Section 3008(a) of RCRA (42 U.S.C. § 6928(a)); 2) an injunction under Section 74-4-10 of the  
28 HWA or Section 3008(a) of RCRA (42 U.S.C. § 6928(a)), or Section 7002(a) of RCRA (42 U.S.C.  
29 § 6972(a)); 3) civil penalties under Section 74-4-10 of the HWA or Sections 3008(a) and (g) of  
30 RCRA (42 U.S.C. §§ 6928(a) and (g)), or Section 7002(a) of RCRA (42 U.S.C. § 6972(a)); 4)  
31 criminal penalties under Section 74-4-11 of the HWA or Sections 3008(d), (e), and (f) of RCRA  
32 (42 U.S.C. §§ 6928(d), (e), and (f)); or 5) some combination of the foregoing. The list of  
33 authorities in this paragraph is not exhaustive and the Department reserves the right to take any  
34 action authorized by law to enforce the requirements of this Permit.

1    **1.9.3     Transfer of Permit**

2    The Permittees shall not transfer this Permit to any person except after prior written approval of the  
3    Department. The Department will require modification or revocation and re-issuance of the  
4    Permit, as specified in 40 CFR §§ 270.40(b) and 270.41(b)(2), to identify the new Permittees and  
5    incorporate other requirements under the HWA, RCRA, and their implementing regulations. The  
6    prospective new Permittees shall file a disclosure statement with the Department, as specified at  
7    §74-4-4.7 of the HWA, prior to modification or revocation and re-issuance of the Permit.

8    Before transferring ownership or operation of the Facility, the Permittees shall notify the new  
9    owner and operator in writing of all applicable requirements of this Permit and 40 CFR §§  
10   264.12(c) and 40 CFR 270.30(1)(3), which are incorporated herein by reference.

11   **1.9.4     Need to Halt or Reduce Activity Not a Defense**

12   The Permittees shall not use as a defense to an enforcement action that the Permittees must reduce  
13   permitted activities in order to maintain compliance with the conditions of this Permit (40 CFR §  
14   270.30(c)).

15   **1.9.5     Duty to Mitigate**

16   In the event of noncompliance with this Permit, the Permittees shall take all reasonable steps to  
17   minimize releases of hazardous wastes and hazardous constituents to the environment and shall  
18   carry out such measures as are reasonable to prevent significant adverse impacts on human health  
19   or the environment (40 CFR § 270.30(d)).

20   **1.9.6     Proper Operation and Maintenance**

21   The Permittees shall at all times properly operate and maintain all facilities and systems of  
22   treatment and control and related appurtenances which are installed or used by the Permittees to  
23   achieve compliance with the conditions of this Permit. Proper operation and maintenance includes  
24   effective performance, adequate funding, adequate operator staffing and training, and adequate  
25   laboratory and process controls including appropriate quality assurance and quality control  
26   (QA/QC) procedures. This provision requires the operation of back-up or auxiliary facilities or  
27   similar systems only when necessary to achieve compliance with this Permit (40 CFR § 270.30(e)).

28   **1.9.7     Duty to Provide Information**

29   The Permittees shall furnish to the Department, within a reasonable time as specified by the  
30   Department, any relevant information which the Department may request to determine whether  
31   cause exists for modifying, suspending, terminating, or revoking this Permit or to determine  
32   compliance with this Permit. The Permittees shall also furnish to the Department, upon request,  
33   copies of records that are required to be kept by this Permit. Information and records requested by  
34   the Department pursuant to this condition shall be provided in paper form, or an electronic, optical,  
35   or magnetic format acceptable to the Department.

1 This Permit condition shall not be construed to limit in any manner the Department's authority  
2 under § 74-4-4.3 of the HWA, § 3007(a) of RCRA, or other applicable law (40 CFR §§ 264.74(a)  
3 and 270.30(h)).

#### 4 **1.9.8 Inspection and Entry**

5 The Permittees shall allow authorized representatives of the Department, upon the presentation of  
6 credentials and at reasonable times, to:

- 7 1. enter upon the Permittees' premises where the regulated facility or activity is located or  
8 conducted or where records must be kept under the conditions of this Permit;
- 9 2. have access to and photograph any facility's equipment (including monitoring and  
10 control equipment), practices, or operations regulated or required under this Permit;
- 11 3. inspect any facility's equipment (including monitoring and control equipment), practices,  
12 or operations regulated or required under this Permit;
- 13 4. have access to, and copy, any records that must be kept under the conditions of this  
14 Permit; and
- 15 5. sample or monitor, for the purposes of ensuring Permit compliance or as otherwise  
16 authorized by the HWA or RCRA, any substances or parameters at any location (40 CFR  
17 § 270.30(i)).

#### 18 **1.9.9 Sampling and Records**

##### 19 **1.9.9.1 Representative Sampling**

20 All samples and measurements taken by the Permittees under any condition in this Permit shall be  
21 representative of the activity, waste, media, equipment, or structure being sampled or measured.  
22 To obtain a representative waste sample, the Permittees shall use an appropriate method from 40  
23 CFR Part 261, Appendix I or an equivalent method approved by the Department. Laboratory  
24 methods must be those specified in the most current edition of *Test Methods for Evaluating Solid*  
25 *Waste Physical/Chemical Methods SW-846*, or an equivalent method, as specified in Attachment C  
26 (*Waste Analysis Plan*) and Permit Section 2.4 (40 CFR § 270.30(j)(1)).

##### 27 **1.9.9.2 Records Retention**

28 The Permittees shall retain copies of all reports and records required by this Permit including, but  
29 not limited to, records of all data used to complete the Application, data gathered or generated  
30 during the closure or post-closure process, laboratory reports, drilling logs, bench-scale or pilot  
31 scale data, and supporting information in accordance with the retention times specified for the  
32 Facility Operating Record at Permit Section 2.12.2 (40 CFR § 270.30(j)(2)).

1 **1.9.10 Reporting Planned Changes**

2 The Permittees shall give notice to the Department, as soon as possible, of any planned physical  
3 alterations or additions to the Facility, in compliance with 40 CFR § 270.30(l)(1), which is  
4 incorporated herein by reference.

5 **1.9.11 Reporting Anticipated Noncompliance**

6 The Permittees shall give advance notice to the Department of any planned changes to the Facility  
7 or any activities that may result in noncompliance with Permit requirements in compliance with 40  
8 CFR § 270.30(l)(2), which is incorporated herein by reference.

9 **1.9.12 Twenty-Four Hour and Subsequent Reporting**

10 The Permittees shall report to the Department any noncompliance, any incident that requires  
11 implementation of Attachment D (*Contingency Plan*), or any incident involving hazardous waste at  
12 the Facility that may endanger human health or the environment in compliance with Permit  
13 Sections 1.9.11 and 2.11.9 (270.30(l)(6)).

14 **1.9.12.1 Oral Report**

15 The Permittees shall make an initial oral report within 24 hours from the time the Permittees  
16 become aware of the noncompliance or incident under Permit Section 1.9.12 or that includes the  
17 following (40 CFR § 270.30(l)(6)(i)):

- 18 1. information concerning the release of any hazardous waste or hazardous constituent  
19 which may endanger public drinking water supplies;
- 20 2. information concerning the release or discharge of any hazardous waste or hazardous  
21 constituents, or of a fire or explosion at the Facility, which may threaten the environment  
22 or human health outside the Facility; and
- 23 3. a description of the occurrence and its cause including:
  - 24 a. name, address, and telephone number of the owner and operator;
  - 25 b. name, address, and telephone number of the Facility;
  - 26 c. date, time, and type of incident;
  - 27 d. name and quantity of materials involved;
  - 28 e. the extent of injuries, if any;
  - 29 f. an assessment of actual or potential hazards to the environment and human health  
30 outside the Facility, where this is applicable; and

1 g. the estimated quantity and disposition of recovered material that resulted from the  
2 incident.

3 The oral report shall be made by calling the Hazardous Waste Bureau's main telephone number  
4 during regular business hours, or by calling the New Mexico Department of Public Safety dispatch  
5 telephone number during non-business hours, and requesting that the report be forwarded to the  
6 Department spill number.

7 **1.9.12.2 Written Report**

8 The Permittees shall submit a written report within five calendar days after the time the Permittees  
9 become aware of the noncompliance or incident under Permit Section 1.9.12. The Permittees'  
10 written report shall contain a description of the noncompliance or incident and its cause including  
11 the following (40 CFR § 270.30(l)(6)(iii)):

- 12 1. name, address, and telephone number of the owner and operator;
- 13 2. name, address, and telephone number of the Facility;
- 14 3. date, time, and type of incident;
- 15 4. the likely cause of the incident, if known;
- 16 5. name and quantity of materials involved;
- 17 6. the extent of injuries, if any;
- 18 7. an assessment of actual or potential hazards to the environment and human health outside  
19 the Facility, where applicable;
- 20 8. an estimated quantity and the disposition of recovered material that resulted from the  
21 incident;
- 22 9. the period of the noncompliance or incident including exact dates and times, and, if the  
23 noncompliance or incident has not been corrected, the anticipated time it is expected to  
24 be corrected; and
- 25 10. steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance,  
26 incident or imminent hazard.

27 The Department may allow submittal of the written report within 15 calendar days in lieu of the  
28 five day requirement above if justifiable cause is provided in advance.

29 **1.9.13 Other Noncompliance**

30 The Permittees shall report all instances of noncompliance not reported under Permit Section  
31 1.9.11 at the time monitoring reports are submitted. These reports shall contain the information

1 listed in Permit Section 1.9.12.2 and 40 CFR 270.30(1)(10), which is incorporated herein by  
2 reference.

3 **1.9.14 Other Information**

4 Whenever the Permittees become aware that they have failed to submit any relevant facts in a  
5 permit application, or have submitted incorrect information in a permit application or a report to  
6 the Department, the Permittees shall promptly report such facts or information in compliance with  
7 40 CFR 270.30(1)(11), which is incorporated herein by reference.

8 **1.9.15 Signatory Requirement**

9 The Permittees shall sign and certify all applications, reports, or information submitted to or  
10 requested by the Department or required by this Permit, in compliance with 40 CFR §§ 270.11 and  
11 270.30(k), which are incorporated herein by reference.

12 **1.9.16 Submissions to the New Mexico Environment Department**

13 The Permittees shall submit all written reports, notifications, or other submissions required by this  
14 Permit to be submitted to the Department by certified mail or hand-delivery to:

15 Bureau Chief  
16 Hazardous Waste Bureau  
17 New Mexico Environment Department  
18 2905 Rodeo Park Drive East, Building 1  
19 Santa Fe, NM 87505-6303

20 The Permittees shall ensure that any notice, deliverable, or other requirement that under the terms  
21 of this Permit would be due on a Saturday, Sunday, or a state or federal holiday shall be due the  
22 first business day following the Saturday, Sunday, or state or federal holiday.

23 **1.9.17 Confidential Information**

24 The Permittees may claim that any information required by this Permit or otherwise submitted to  
25 the Department is confidential pursuant to the provisions of §§ 74-4-4.3(D) and (F) of the HWA  
26 and 40 CFR §§ 260.2 and 270.12.

27 **1.9.18 New or Modified Permitted Units**

28 The Permittees may not treat or store hazardous waste at a new permitted unit or in a modified  
29 portion of an existing permitted unit except as provided in 40 CFR § 270.42 until the Permittees  
30 have complied with the requirements of 40 CFR §§ 270.30(1)(2)(i) and (ii).

31 **1.10 INFORMATION REPOSITORY**

32 The Permittees shall establish and maintain an Information Repository at the LANL Community  
33 Reading Room (40 CFR 270.30(m)). The Permittees shall allow public access to the Information  
34 Repository during normal business hours and shall provide access in the Information Repository in

1 compliance with 40 CFR §§ 124.33 and 270.30(m). The Permittees shall establish the Information  
2 Repository within 180 days of the effective date of this Permit.

3 The Permittee's Information Repository shall contain the following:

- 4 1. a kiosk at the LANL Community Reading Room that includes a computer linked to the  
5 NMED/HWB/LANL administrative record web site;
- 6 2. complete, legible, hard copies (and electronic copies if available) of all documents  
7 relating to the Permittee's previous activities which resulted or may have resulted in the  
8 generation, management, or actual or potential release of solid waste, hazardous waste, or  
9 hazardous constituents, including correspondence, reports, data, photographs, aerial  
10 photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices;
- 11 3. complete, legible, hard copies (and electronic copies if available) of all documents  
12 relating the Permittee's Part A and Part B Permit Applications, this Permit, and interim  
13 status Closure Plans and Post-Closure Care Plans including, but not limited to, any  
14 correspondence, photographs, aerial photographs, maps, figures, drawings, tables,  
15 attachments, enclosures, and appendices;
- 16 4. complete, legible, hard copies (and electronic copies if available) of all documents  
17 relating any sampling, monitoring, investigation, clean up, and corrective action of solid  
18 waste, hazardous waste, or hazardous constituents conducted at LANL including, but not  
19 limited to, work plans, evaluations, historical reports, data, aerial photographs,  
20 engineering drawings, glossy photographic imprints, maps, figures, drawings, tables,  
21 attachments, enclosures, and appendices; and
- 22 5. a searchable database that contains an index of all documents stored in the repository.

23 The Permittees shall add new documents, reports, data, and information to the Information  
24 Repository within 30 calendar days after the new documents, reports, data, and information are  
25 submitted to the Department or placed in the Facility Operating Record.

26 The Permittees shall inform the public of its Information Repository by including in the public  
27 notice for any of the Permittees initiated permit modifications a statement discussing the existence  
28 of the Information Repository, its location, and its hours of availability.

29 The Permittees shall state the existence and identify the location of the Information Repository on  
30 the LANL web site.

31 The Permittees shall inform all interested persons of a change in location of the Information  
32 Repository by informing all persons on the Facility mailing list of the new location and publishing  
33 a public notice in at least the Santa Fe New Mexican, the Albuquerque Journal, and the Los  
34 Alamos Monitor.

1 **1.11 GENERAL DOCUMENTS AND INFORMATION TO BE MAINTAINED AT**  
2 **THE FACILITY**

3 The Permittees shall maintain at the Facility until the Department has approved either the closure  
4 or post-closure certification statements for applicable permitted units at the Facility, or until final  
5 closure for Facility, the following documents and all amendments, revisions, and modifications to  
6 these documents:

- 7 1. this Permit, including all attachments;
- 8 2. a general description of the Facility as required by this Permit;
- 9 3. a topographic map as required by 40 CFR §§ 264.18 and 270.13 and this Permit;
- 10 4. the chemical and physical analyses of the hazardous wastes managed or handled at  
11 particular permitted units at the Facility under this Permit including all the information  
12 required to treat or store the wastes properly under the requirements of 40 CFR Part 264  
13 and as required by this Permit;
- 14 5. the Waste Analysis Plan as required by 40 CFR § 264.13(b) and this Permit;
- 15 6. security procedures and a listing of security equipment as required by 40 CFR § 264.14  
16 and this Permit;
- 17 7. inspection schedules and results as required by 40 CFR § 264.15(b)(2) and this Permit;
- 18 8. preparedness and prevention procedures and a listing of related equipment as required by  
19 40 CFR Part 264, Subpart C, and this Permit;
- 20 9. personnel training records including those for both introductory and continuing training  
21 programs used to prepare employees to safely operate and maintain the Facility in  
22 compliance with 40 CFR § 264.16(d) and this Permit;
- 23 10. the Contingency Plan and any summary reports and details of all incidents that require  
24 implementation of the Contingency Plan and a copy of all Memorandums of Agreement,  
25 Memorandums of Understanding, Mutual Aid Agreements, and contracts with emergency  
26 response contractors and suppliers required by Permit Section 2.11 and 40 CFR §  
27 264.56(j);
- 28 11. a description of procedures, structures, or equipment used at the Facility to prevent  
29 hazards in loading and unloading operations, prevent run-off from hazardous waste  
30 handling areas to other areas of the Facility or environment or to prevent flooding,  
31 prevent contamination of water supplies, mitigate the effects of equipment failure and  
32 power outages, prevent undue exposure of personnel to hazardous waste, and prevent  
33 releases to the atmosphere as required under this Permit;

1 12. special precautions for ignitable, reactive, or incompatible wastes as required by 40 CFR  
2 § 264.17 and this Permit;

3 13. the Facility Operating Record, as required by 40 CFR § 264.73 and Permit Section  
4 2.12.2;

5 14. Closure Plans for each permitted unit as required by 40 CFR § 264.112 and this Permit;

6 15. Post-Closure Care Plans; and

7 16. financial assurance documentation.

8 The Permittees shall maintain the information and records referenced in this Permit Section in  
9 paper form, or in an electronic, magnetic, or optical form acceptable to the Department.

## 10 **1.12 COMMUNITY RELATIONS PLAN**

11 The Permittees shall establish and implement a Community Relations Plan to inform the public of  
12 investigation and cleanup activities conducted under this Permit and to inform the public of safety  
13 issues concerning hazardous wastes and hazardous constituents released at the Facility and beyond  
14 its boundary. The Permittees shall post the Plan on the Permittee's web site within 180 days of the  
15 effective date of this Permit.

16 The Permittees shall consult with the Pueblos of San Ildefonso and Santa Clara when developing  
17 the Community Relations Plan in an effort to ensure the program is responsive to the needs of the  
18 neighboring communities. The Permittees shall document in the Facility Operating Record such  
19 consultation and any agreements or disagreements between the Permittees and the Pueblos  
20 regarding the Community Relations Plan. The Permittees shall maintain and implement the  
21 Community Relations Plan until completion of corrective action or any post-closure care period at  
22 the Facility (40 CFR §§ 264.101 and 270.32(b)(2)).

23 The Permittees shall develop and maintain an electronic mailing (e-mail) list of interested parties to  
24 notify members of the public concerning actions identified in this Permit requiring e-mail  
25 notification. The Permittees shall provide a link on the LANL home page <<http://www.lanl.gov>>  
26 whereby members of the public may review the actions requiring email notification and submit a  
27 request to be placed on this list.

28 The Permittees shall inquire to all interested parties annually how they may be made better  
29 informed of issues related to this Permit. The Permittees shall on September 1<sup>st</sup> of each year  
30 publicize on the Permittee's web site a compilation of all such interested party comments together  
31 with the Permittees' responses to those comments.

## 32 **1.13 DISPUTE RESOLUTION**

33 In the event the Permittees disagree, in whole or in part, with a condition or disapproval of any  
34 submittal, the Permittees may seek dispute resolution.

1 **1.13.1 Notice to the Department**

2 To invoke dispute resolution, the Permittees shall notify NMED in writing within 30 calendar days  
3 of receipt of the Department's approval with conditions or disapproval of a submittal. Such notice  
4 shall set forth the specific matters in dispute, the position the Permittees asserts should be adopted,  
5 the basis for the Permittees' position, and any matters considered necessary for the Department's  
6 determination.

7 **1.13.2 Agreement or Disagreement between Parties**

8 The Department and the Permittees shall have 30 calendar days from the Department's receipt of  
9 notification provided under Permit Section 1.13.1 to meet or confer to resolve any disagreement.  
10 In the event an agreement is met, the Permittees shall comply with the terms of such agreement or  
11 if appropriate, submit a revised submittal and implement the same in accordance with and within  
12 the time frame specified in such agreement.

13 **1.13.3 Final Decision of the Department**

14 If an agreement is not reached within the 30 calendar day period, the Department will notify the  
15 Permittees in writing of its decision on the dispute and the Permittees shall comply with the terms  
16 and conditions of the decision. Such a decision shall be the final resolution of the dispute and shall  
17 be incorporated as an enforceable part of this Permit. The Permittees shall implement the decision  
18 in accordance with and within the time frame specified in such a decision.

19 **1.13.4 Actions Not Affected by Dispute**

20 With the exception of those conditions under dispute, the Permittees shall proceed to take any  
21 action required by those portions of the submission and of this Permit that the Department  
22 determines not to be affected by the dispute.

23 **1.14 COMPLIANCE SCHEDULE**

24 The Permittees shall submit documents to the Department for its approval, or perform other actions  
25 required by this Permit, in accordance with the schedule provided in Attachment N (*Compliance*  
26 *Schedule*) (40 CFR § 270.33(a)). The Permittees shall provide the Department written notification  
27 of its compliance with the schedule no later than 14 days following the scheduled date unless a  
28 submittal requirement is met.

29 Schedules required to be submitted by the conditions of this Permit are, upon approval of the  
30 Department, incorporated into this Compliance Schedule by reference and become an enforceable  
31 condition of this Permit. Any non-compliance with approved schedules shall be deemed  
32 noncompliance with this Permit. Extension of submittal or activity due dates may be granted by  
33 the Department in accordance with 40 CFR §§ 270.41 or 270.42.

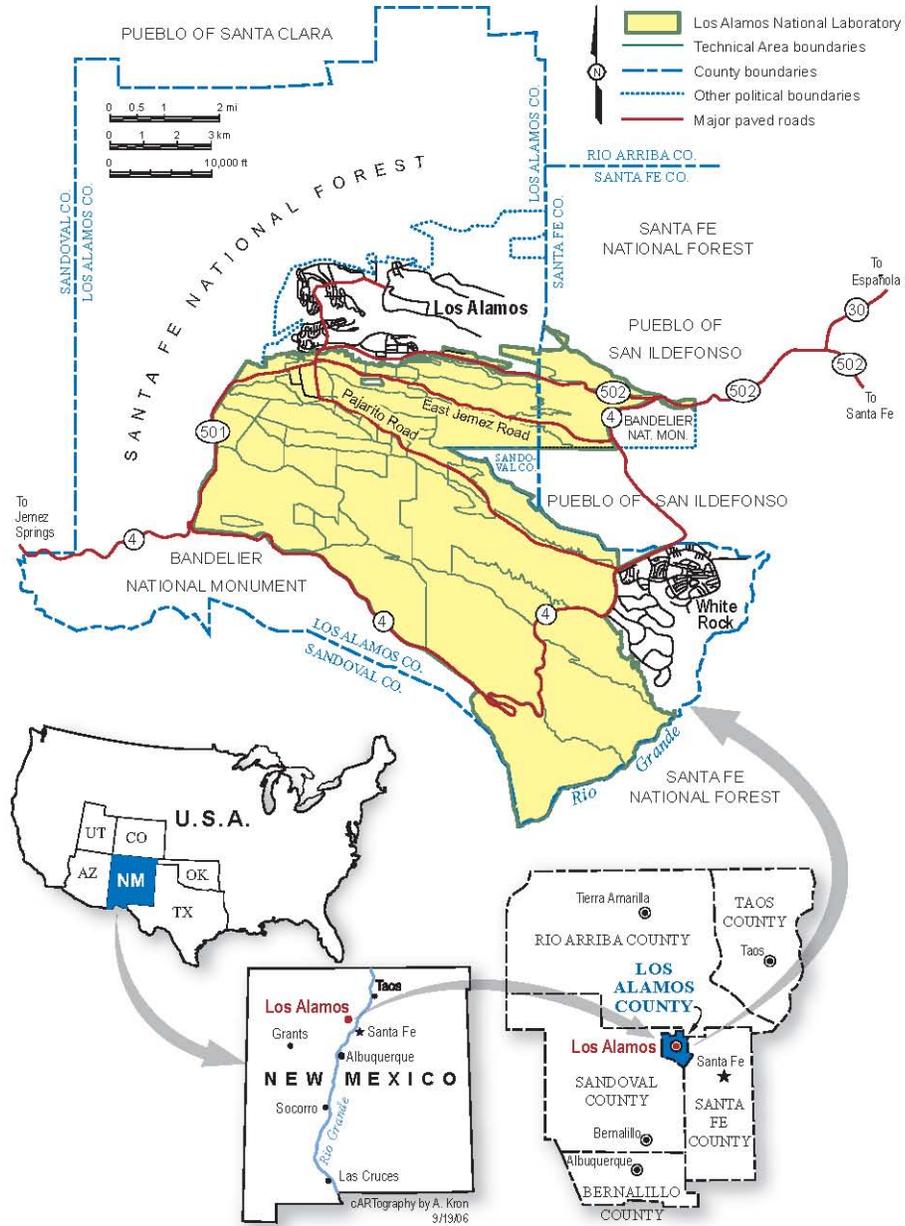


Figure 1-1  
 Regional Location Map of Los Alamos National Laboratory and Surrounding Land Use

1

## **PART 2: GENERAL FACILITY CONDITIONS**

2 **2.1 DESIGN, CONSTRUCTION, MAINTENANCE, AND OPERATION OF THE**  
3 **FACILITY**

4 The Permittees shall design, construct, maintain, and operate the Facility to minimize the  
5 possibility of fire, explosion, or any unplanned, sudden, or non-sudden release of hazardous waste  
6 or hazardous constituents to air, soil, groundwater, or surface water that could threaten human  
7 health or the environment (40 CFR § 264.31).

8 **2.2 AUTHORIZED WASTES**

9 The Permittees shall accept, store, treat, or otherwise manage at permitted units at the Facility only  
10 those hazardous wastes the Permittees proposed to manage at the units in the Permit Application,  
11 which are those wastes bearing the EPA Hazardous Waste Numbers (waste codes) listed in  
12 Attachment B (*Part A Application*).

13 **2.2.1 Hazardous Waste from Off-Site Sources**

14 The Permittees may accept, store, treat or otherwise manage at permitted units at the Facility only  
15 those hazardous wastes from the following off-site sources:

- 16 1. one of the sources listed in Attachment Q (*Off-Site Facilities*);  
17 2. hazardous waste generated by the Permittees at TA-57 (the Fenton Hill site); and  
18 3. hazardous waste generated by the Permittees as a result of investigation or remediation of  
19 a solid waste management unit (SWMU) or area of concern (AOC) listed in Attachment  
20 P (*Listing of SWMUs and AOCs*).

21 **2.2.2 Prohibited Wastes**

22 **2.2.2.1 Hazardous Waste Imports**

23 The Permittees shall not accept, store, treat, or otherwise manage at permitted units at the Facility  
24 hazardous wastes from foreign sources.

25 **2.2.2.2 PCB-Contaminated Waste**

26 The Permittees shall not store liquid hazardous wastes containing polychlorinated biphenyls  
27 (PCBs) at concentrations greater than or equal to 50 parts per million (ppm) unless such storage is  
28 for less than one year from the date the waste is placed in storage and is in compliance with all  
29 requirements of 40 CFR § 761.65(b) (40 CFR § 268.50(f)).

1 **2.3 LAND DISPOSAL RESTRICTION COMPLIANCE**

2 **2.3.1 Hazardous Waste Long-Term Storage**

3 The Permittees shall not store hazardous wastes beyond one year from the date that the wastes  
4 were first placed into storage at a permitted unit unless the Permittees are able to demonstrate to  
5 the Department that one of the following conditions exist:

- 6 1. that such storage is solely for the purpose of accumulating such quantities of hazardous  
7 waste as are necessary to facilitate proper recovery, treatment, or disposal;
- 8 2. that the waste meets all of the applicable LDR treatment standards; or
- 9 3. that a mixed waste is included in the Site Treatment Plan (STP) under the Federal Facility  
10 Compliance Order (FFCO) and such storage is otherwise in compliance with all  
11 requirements of the STP and FFCO (40 CFR §§ 268.50(b) and (e)).

12 The one year storage limit applies cumulatively to all permitted units at the Facility. Except as  
13 provided in items 1 through 3 above, waste shall not be stored at the Facility for more than one  
14 year even if it is stored for less than one year each at two or more storage units (40 CFR §  
15 270.32(b)).

16 The Permittees shall ensure that each container of hazardous waste that is placed into storage at a  
17 permitted unit is clearly marked to identify the date the period of storage began (40 CFR §  
18 268.50(a)(2)(i)). Further, the Permittees shall ensure that each tank at a permitted unit into which  
19 hazardous waste is placed is clearly marked to identify the date the period of accumulation began  
20 (40 CFR § 268.50(a)(2)(ii)).

21 **2.3.2 Prohibition on Dilution**

22 The Permittees shall not dilute a waste that is prohibited from land disposal or the residue from  
23 treatment of a prohibited waste as a substitute for treatment as specified at 40 CFR § 268.3, which  
24 is incorporated herein by reference. Dilution to avoid an applicable treatment standard includes,  
25 but is not limited to, the addition of solid waste to reduce a hazardous constituent's concentration  
26 or ineffective treatment that does not destroy, remove, or permanently immobilize hazardous  
27 constituents. Aggregating or mixing wastes as part of a legitimate treatment process is not  
28 impermissible dilution for purposes of this Permit.

29 **2.3.3 Documentation of Exclusion or Exemption**

30 The Permittees shall place a one-time notice in the Facility Operating Record for any land disposal  
31 prohibited wastes that the Permittees determine to be excluded from the definition of hazardous or  
32 solid waste or determine to be exempted from Subtitle C regulation under 40 CFR §§ 261.2  
33 through 261.6 subsequent to the point of generation (40 CFR §§ 268.7(a)(7)). Exemptions  
34 required to be documented include, but are not limited to, deactivated characteristic hazardous  
35 waste managed in wastewater treatment systems subject to the Clean Water Act (CWA) as  
36 specified at 40 CFR 261.4(a)(2) or that are CWA-equivalent. The Permittees shall include in this

1 documentation a description of the waste's generation process, a description of why it is exempted  
2 or excluded, and a description of the waste's disposition.

## 3 **2.4 WASTE ANALYSIS**

### 4 **2.4.1 General Waste Characterization Requirements**

5 The Permittees shall accept, store, treat, or otherwise manage at permitted units at the Facility only  
6 those hazardous wastes that have been fully characterized in accordance with the requirements of  
7 40 CFR § 264.13, which is incorporated herein by reference, these Permit conditions, and  
8 Attachment C (*Waste Analysis Plan*).

9 At a minimum, the Permittees must obtain and document all of the information that must be known  
10 to treat, store, or otherwise manage a hazardous waste in accordance with 40 CFR Parts 264 and  
11 268, which are incorporated herein by reference, including but not limited to the following:

- 12 1. all applicable EPA hazardous waste numbers;
- 13 2. waste characteristics necessary to determine whether the waste is prohibited from land  
14 disposal;
- 15 3. waste characteristics necessary to prevent the mixing or placing of incompatible wastes in  
16 the same container (40 CFR §§ 264.17 and 264.177) or in a tank system (40 CFR §  
17 264.199) and to prevent the impairment of containers (40 CFR § 264.172) and secondary  
18 containment by associated wastes (40 CFR § 264.193(c)(1));
- 19 4. waste characteristics necessary to prevent accidental ignition or reaction of ignitable or  
20 reactive wastes (40 CFR § 264.17), including spontaneous ignition, in containers (40  
21 CFR § 264.177) and tank systems (40 CFR § 264.198);
- 22 5. whether the waste has a radiological component (40 CFR § 270.32(b)); and
- 23 6. the presence of free liquids.

24 The Permittees shall document the following for each hazardous waste managed under this  
25 Permit:

- 26 1. the waste name;
- 27 2. the unique waste identifier;
- 28 3. the waste generation location (e.g. building and room number); and
- 29 4. a detailed description of the waste generation process that includes all material inputs or  
30 other information that identifies the chemical content and physical form of the waste.

31 The Permittees shall characterize waste by using current sampling and analysis, acceptable  
32 knowledge, or a combination of the two methods. When acceptable knowledge is insufficient to

1 fully characterize a waste, the Permittees shall utilize sampling and analysis to complete that  
2 characterization.

### 3 **2.4.2 Sampling and Analysis for Hazardous Wastes**

4 The Permittees shall perform all sampling and analytical procedures used for waste  
5 characterization in accordance with the most recent version of *Test Methods for Evaluating Solid*  
6 *Waste, Physical/Chemical Methods* (U.S. EPA Publication SW-846) or an equivalent method that  
7 has received prior approval from the Department.

8 The Permittees shall ensure that samples collected and analyzed for waste characterization are  
9 representative of both the chemical composition and the entire volume of the waste under  
10 consideration.

11 The Permittees shall ensure that procedures used to collect a representative sample of a waste  
12 preserve its original physical form and composition and ensure prevention of contamination or  
13 changes in concentration of the constituents to be analyzed.

14 The Permittees shall conduct a quality assurance program to ensure that sample collection and  
15 analytical procedures used to support waste characterization required under this Permit are  
16 technically accurate and statistically valid. This quality assurance program must comply with the  
17 quality assurance requirements in *SW-846*. The Permittees shall identify and perform the  
18 appropriate number of control samples associated with each sample collected (e.g., trip and field  
19 blanks, field duplicates, field spikes).

20 When performing laboratory analysis, the Permittees, or a laboratory under contract to the  
21 Permittees, shall analyze the appropriate number of method blanks, laboratory duplicates, and  
22 laboratory control samples to assess the quality of the data resulting from laboratory analytical  
23 programs.

24 The Permittees shall maintain a record in the Facility Operating Record of all quality assurance  
25 procedures utilized in the sampling and analysis of wastes.

26 If the Permittees use an independent contract laboratory to perform analyses, the Permittees shall  
27 enter into a written contract with the laboratory that requires the analytical laboratory to operate in  
28 accordance with the waste analysis conditions set forth in this Permit. Copies of all such contracts  
29 with independent contract laboratories shall be kept in the Facility Operating Record (40 CFR §  
30 270.32(b)).

31 If the Permittees choose to propose an analytical method that deviates from an established method  
32 in *SW-846*, the Permittees must demonstrate and document to the Department that the proposed  
33 analytical procedure is equal to, or superior to, the corresponding method in *SW-846* in terms of its  
34 sensitivity, accuracy, and precision (i.e., reproducibility). The Permittees must submit a written  
35 request to the Department 90 days prior to using the proposed sampling or analytical procedure.  
36 This request must include the following information:

- 37 1. a statement of the need and justification for the proposed action;

- 1        2. a full description of the proposed method (i.e., a standard operating procedure) including  
2            all procedural steps and equipment used in the method;
- 3        3. a description of the types of wastes, or waste matrices, for which the proposed method  
4            may be used;
- 5        4. performance data;
- 6        5. comparative results obtained from using the proposed method with those obtained from  
7            using the relevant or corresponding methods prescribed in *SW-846* and 40 CFR Parts 261  
8            and 264;
- 9        6. an assessment of any factors which may interfere with or limit the use of the proposed  
10           method; and
- 11       7. a description of the quality control procedures necessary to ensure the sensitivity,  
12           accuracy, and precision of the proposed method.

13       The Department must issue a written approval of the alternative method before the Permittees may  
14       substitute it for an approved method under this Permit.

#### 15       **2.4.3        Acceptable Knowledge**

16       The Permittees may use acceptable knowledge (AK) to characterize waste in lieu of, or to  
17       supplement, sampling and analysis. The Permittees shall document all uses of AK, and include in  
18       the AK documentation all of the background information assembled and used in the  
19       characterization process whether or not the information supports the decision to use AK (40 CFR §  
20       270.32(b)). The record must document the resolution of any data discrepancies between different  
21       sources of AK. Acceptable knowledge documentation must be maintained in an auditable form in  
22       the Facility Operating Record. The Permittees shall assign a traceable identification number to this  
23       documentation to facilitate both access to this information and its verification by the Permittees  
24       and the Department.

#### 25       **2.4.4        Wastes Received from Off-Site**

26       If any hazardous waste is received at the Facility from an off-site generator, the Permittees shall  
27       obtain from the generator a detailed characterization of a representative sample of such hazardous  
28       waste. If AK is used for the waste characterization, the Permittees shall require the generator to  
29       provide all AK documentation used to characterize the waste (40 CFR § 270.32(b)). In addition,  
30       the Permittees shall ensure that all applicable waste characterization requirements specified in  
31       Permit Section 2.4 have been met and documented.

32       The Permittees shall ensure that the waste matches the identity of the waste designated on the  
33       accompanying manifest or shipping paper. If discrepancies between the waste received and the  
34       information on the manifest are found, the Permittees shall notify the Department of the  
35       discrepancy within five days, and shall return the waste to the off-site generator within 90 days,

1 unless the generator provides an acceptable resolution to the discrepancy within 90 days after  
2 receipt of the waste at the Facility.

### 3 **2.4.5 Treatment-Derived Waste**

4 The Permittees shall characterize treatment-derived wastes by determining whether the treatment  
5 residues meet the applicable treatment standard in accordance with 40 CFR § 268.7(b), which is  
6 incorporated herein by reference, unless the Permittees have documented that the purpose of the  
7 treatment process is not to attain the applicable treatment standard. The Permittees shall ensure  
8 adherence to notification and recordkeeping requirements specified at 40 CFR § 268.7(b)(3)(ii). If  
9 the waste remains a hazardous waste, the Permittees shall further characterize it in compliance with  
10 the applicable requirements of Permit Section 2.4.

### 11 **2.4.6 Thermal Treatment**

12 The Permittees shall sufficiently analyze any waste which has not been previously treated in the  
13 thermal process (open burning) to establish appropriate operating conditions (including waste  
14 quantity and auxiliary fuel feed) and to determine the type of pollutants which might be emitted  
15 (40 CFR § 270.32(b)). At a minimum, the analysis must determine:

- 16 1. heating value of waste;
- 17 2. waste constituent emission factors;
- 18 3. halogen and sulfur content in the waste; and
- 19 4. concentrations of lead and mercury in the waste, unless the Permittees have written,  
20 documented data that show that these elements are not present.

### 21 **2.4.7 Waste Characterization Review**

22 The Permittees shall ensure that the initial characterization of any hazardous waste stream  
23 managed under the Permit is reviewed or repeated to verify that the characterization is accurate  
24 and up-to-date (40 CFR § 264.13(b)(4)).

25 The Permittees shall perform the following:

- 26 1. at a minimum, annually re-characterize all regenerated hazardous waste streams managed  
27 under this Permit to verify the accuracy of initial and subsequent characterization results;
- 28 2. re-characterize hazardous wastes managed under this Permit whenever there is a change  
29 in either the waste-generating processes that may affect the physical or chemical  
30 properties, the listed status of the waste stream, or the LDR status of the waste;
- 31 3. annually verify the waste characterization of one percent of hazardous waste streams  
32 characterized solely utilizing AK (40 CFR §§ 264.13(b)(4) and 270.32(b)). Such waste  
33 characterization verification shall be performed by quantitative chemical analysis  
34 appropriate for the waste as specified in Attachment C (*Waste Analysis Plan*). The one

1 percent of wastes whose characterization is to be verified shall be determined in relation  
2 to the total number of unique waste streams managed at TA-54 in the previous calendar  
3 year. To count wastes within a year, each waste material generated from a single process  
4 and distinguishable from other waste material by input materials, physical form,  
5 hazardous constituents, EPA Hazardous Waste Numbers, and LDR status, shall be  
6 counted as a single unique waste stream. The waste streams whose characterization is to  
7 be verified shall be chosen without further bias and the selection procedure shall be  
8 documented in the Facility Operating Record. Wastes not required to undergo this annual  
9 verification and not to be counted toward the total number of wastes managed in the  
10 previous year include mixed TRU wastes, hazardous debris, and hazardous wastes that  
11 are hazardous only because they are listed at 40 CFR Part 261, Subpart D; and

- 12 4. re-characterize a hazardous waste stream managed under this Permit whenever the  
13 Permittees are notified by a receiving off-site facility that the characterization of a  
14 hazardous waste they obtained from the Permittees' Facility does not match a pre-  
15 approved waste analysis certification or accompanying waste manifest or shipping paper.  
16 The Permittees shall notify the Department in writing within 24 hours of their receipt of  
17 such a discrepancy notice from a receiving facility.

18 Wastes listed at 40 CFR § 261.33 (i.e., discarded commercial chemical products, off-specification  
19 species, container residues, and spill residues thereof) and for which the Permittees possess a  
20 Material Safety Data Sheet (MSDS), or equivalent information from the manufacturer identifying  
21 chemical content, are exempt from the re-evaluation requirements of this Permit condition.

#### 22 **2.4.8 Waste Characterization for Compliance with RCRA Air Emission Requirements**

23 The Permittees shall characterize hazardous wastes managed in containers and tanks to determine  
24 the average volatile organic compound (VOC) concentration relative to 500 parts per million by  
25 weight (ppmw) at the point of waste origination in compliance with 40 CFR Part 264, Subpart CC.  
26 The Permittees shall determine the average VOC concentration either by utilizing verifiable AK or  
27 by using the procedures specified in 40 CFR § 264.1083(a). The Permittees shall review and  
28 update this determination at least once every 12 months following the date of the initial  
29 determination in compliance with 40 CFR § 264.1082(c)(1).

30 The Permittees shall not be required to control air pollutant emissions from a container or tank and  
31 thus shall not be required to determine the average VOC concentration of the waste in the  
32 following circumstances:

- 33 1. if the container or tank manages mixed waste (40 CFR § 264.1080(b)(6)); or  
34 2. if the container holding the wastes has a total capacity of less than 0.1 cubic meters  
35 (approximately 26 gallons).

36 The Permittees shall also not be required to determine the average VOC concentration of wastes if  
37 control of air pollution emissions from containers is achieved utilizing the container construction  
38 specifications and operation requirements at 40 CFR § 264.1086(b).

1    **2.4.9     Waste Characterization for Compliance with Land Disposal Restrictions**

2    When using laboratory analysis as part of a hazardous waste characterization, the Permittees shall  
3    require the laboratory to report concentrations of all hazardous constituents listed at 40 CFR §  
4    268.48, *Table of Universal Treatment Standards*, that the analytical test method used is capable of  
5    measuring (40 CFR § 270.32(b)). When performing or obtaining laboratory analysis to  
6    demonstrate that a waste meets its applicable LDR treatment standard concentrations specified in  
7    40 CFR § 268.40, *Treatment Standards for Hazardous Wastes*, in compliance with 40 CFR §  
8    268.7(a) and (b), the Permittees shall ensure that analytical method practical quantification limits  
9    are not higher than the applicable treatment standard (40 CFR § 270.32(b)).

10   The Permittees shall characterize treatment-derived wastes, including wastes that have been treated  
11   so that they are no longer characteristic hazardous waste, to determine whether the waste meets  
12   the applicable LDR treatment standards specified at 40 CFR §§ 268.40, 268.45, 268.48, and 268.49  
13   (40 CFR § 268.7(b)), unless the Permittees have documented that the purpose of the treatment  
14   process is not to attain the applicable treatment standard. The Permittees shall characterize  
15   treatment-derived wastes to determine the presence of any of the constituents of concern for  
16   hazardous waste codes F001 through F005 and F039 and underlying hazardous constituents in  
17   characteristic wastes as defined at 40 CFR § 268.2 unless the waste will be treated and monitored  
18   off-site for all constituents (40 CFR § 268.7(b)(3)(ii)). The Permittees shall document in the  
19   Facility Operating Record such off-site treatment and monitoring (40 CFR § 270.32(b)).

20   **2.4.10    Waste Characterization Documentation**

21   The Permittees shall maintain all waste characterization information in the Facility Operating  
22   Record. For records that contain waste characterization information but are required to be archived  
23   elsewhere at the Facility, such as laboratory record books, the Permittees shall assign a traceable  
24   identification number to this documentation to facilitate access to this information by the  
25   Permittees and Department (40 CFR § 270.32(b)). Facility generators shall maintain this waste  
26   characterization documentation in accordance with the record retention requirements specified for  
27   the Facility Operating Record.

28   **2.5     SECURITY**

29   The Permittees shall prevent the unknowing entry and minimize the possibility for the  
30   unauthorized entry of persons or livestock onto permitted units within the Facility (40 CFR §  
31   264.14). The Permittees shall adhere to the security requirements in the TA-specific Permit Parts  
32   (Parts 12, 13, 14, 15, and 16) and the requirements identified in the Permit Attachments,  
33   specifically Attachment I (*Open Burn Unit Management*) for TA-16, Attachment G (*Container*  
34   *Management*) for TAs 3, 50 and 54, and Attachment A (*General Facility Description*) for TA-55.

35   The Permittees shall ensure the security of the permitted units by maintaining the following  
36   measures:

- 37       1. a 24-hour surveillance system which continuously monitors and controls entry into the  
38       permitted units within the Facility;

- 1        2. a means to control entry to the permitted unit at all times through gates, stations, or other
- 2            entrances (e.g., attendants, locked entrances, controlled roadway access); and
- 3        3. security fences.

4        The Permittees shall maintain and ensure the effectiveness of all security fences, entry gates, and

5        entry stations surrounding permitted units as specified in Figures 2-1 through 2-7 in this Permit

6        Part. The Permittees shall submit to the Department figures for TA-54 Areas G and L identifying

7        security fences, entry gates, and entry stations within the time specified in Attachment N

8        (*Compliance Schedule*).

### 9        **2.5.1        Warning Signs**

10       The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and

11       perimeter fences around permitted units at the Facility (40 CFR § 264.14(c)). Signs shall be posted

12       in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25

13       feet. The Permittees shall include on the signs the following or equivalent language:

14       **DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA**

15       **ENTRADA A PERSONAS NO AUTORIZADAS)**

16       The Permittees shall also post warning signs in the appropriate dialect of Tewa in a manner

17       equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the

18       Facility’s permitted units and the Pueblo of San Ildefonso (PO WHO GEH) and the Santa Clara

19       Pueblo (Kha-'Po).

### 20       **2.6        GENERAL INSPECTION REQUIREMENTS**

21       The Permittees shall inspect all permitted units for malfunctions and deterioration, operator errors,

22       and discharges which may be causing, or may lead to: 1) a release of hazardous constituents to the

23       environment; or 2) a threat to human health. Inspections shall be conducted of all waste

24       management structures, base materials, containers, monitoring equipment, safety and emergency

25       equipment, security devices, and operating equipment that are important in preventing, detecting,

26       and responding to environmental or human health hazards associated with hazardous wastes.

27       The Permittees shall implement the inspection program for the permitted units at the Facility in

28       compliance with the operating schedule, recordkeeping, and response action commitments in

29       Attachment E (*Inspection Plan*).

30       The Permittees shall maintain this Permit’s inspection requirements, including this Permit

31       condition and Attachment E (*Inspection Plan*), at the administrative office of all applicable

32       permitted units or at the permitted unit. The Permittees’ ability to access an electronic version of

33       this Permit’s inspection requirements at the above locations shall be deemed to satisfy this Permit

34       condition.

1    **2.6.1     Inspection Schedule**

2    The Permittees shall conduct inspections to identify problems in time to correct them before they  
3    harm human health or the environment (40 CFR § 264.15). The Permittees shall inspect permitted  
4    units at the Facility, including any containers, monitoring equipment, safety and emergency  
5    equipment, security devices, and operating and structural equipment, at least once a week, in  
6    compliance with the inspection schedules contained in Attachment E (*Inspection Plan*).

7    The Permittees shall inspect areas subject to spills, such as loading and unloading areas, daily  
8    when in use (CFR § 264.15(b)(4)).

9    **2.6.2     Repair of Equipment and Structures**

10   The Permittees shall remedy any deterioration or malfunction of equipment or structures  
11   discovered during an inspection that may lead to an environmental or human health hazard. The  
12   Permittees shall remedy such deterioration or malfunction within 24 hours of discovery of the  
13   problematic situation. The Permittees shall immediately implement remedial action where a  
14   hazard is imminent or has already occurred (40 CFR § 264.15(c)).

15   If a container holding hazardous waste is not in good condition (e.g., severe rust, apparent  
16   structural defects, leaks) the Permittees shall transfer the waste to a container that is in good  
17   condition within 24 hours of discovery of the problematic situation (40 CFR § 264.171).

18   **2.6.3     Inspection Logs and Records**

19   The Permittees shall record the results of inspections on the *Hazardous and Mixed Waste Facility*  
20   *Inspection Record Form* in Attachment E (*Inspection Plan*), or an equivalent form approved by the  
21   Department, for each inspection conducted under Permit Section 2.6 and Attachment E. At a  
22   minimum, the Permittees shall produce a handwritten record of the date and time of the inspection,  
23   an identification of the permitted unit and associated structures or equipment, the name of the  
24   inspector, a notation of the observations made, and the date and nature of any repairs or other  
25   remedial actions (40 CFR § 264.15(d)). The Permittees shall ensure that these records are clearly  
26   legible, all handwritten information is in ink, and any errors are crossed out with one line and  
27   initialed and dated by the inspector making the correction.

28   The Permittees shall record the locations, dimensions, and repairs of all identified cracks or gaps in  
29   floors or base materials.

30   The Permittees shall also record the following observations or actions in the Facility Operating  
31   Record:

- 32       1. the results of any preventative maintenance activities including, but not limited to,  
33         maintenance on floors, secondary containment structures, unit drainage structures, and  
34         fire protection equipment at a permitted unit;
- 35       2. any malfunctions and deterioration of such equipment;

- 1       3. any operator errors at a permitted unit;
- 2       4. any discharges of hazardous waste, hazardous constituents, or fire suppression systems at
- 3       a permitted unit; and
- 4       5. any occurrences that might cause, exacerbate, or otherwise affect the contamination of a
- 5       permitted unit, including but not limited to, spills or liquid inundations.

6 The Permittees shall maintain paper copies of inspection logs in the Facility Operating Record  
7 for a minimum of three years from the date of inspection (40 CFR § 264.15(d)). The Permittees  
8 shall maintain unalterable electronic copies of inspection logs in the Facility Operating Record  
9 until closure or post-closure certification is approved for a particular permitted unit as specified  
10 in Permit Section 2.12.2 (40 CFR § 270.32(b)).

## 11 **2.7 PERSONNEL TRAINING**

12 The Permittees shall ensure that all Facility personnel who are involved in hazardous waste  
13 management activities regulated under this Permit successfully complete the training program in  
14 compliance with the training requirements of 40 CFR § 264.16 as well as the training requirements  
15 in Attachment F (*Personnel Training Plan*).

## 16 **2.8 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR** 17 **INCOMPATIBLE WASTE**

18 The Permittees shall manage ignitable, reactive, and incompatible hazardous wastes in containers  
19 and tanks in compliance with the requirements of 40 CFR §§ 264.17, 264.176, 264.177, 264.198,  
20 and 264.199, the TA-specific Permit Parts (Parts 12, 13, 14, 15, and 16), and the requirements  
21 specified in Attachment G (*Container Management*), Attachment H (*Tank Management*), and  
22 Attachment I (*Open Burn Unit Management*).

23 The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least  
24 15 meters (50 feet) from the facility boundary defined as the TA-specific boundary identified in  
25 Figure 2-8 (40 CFR §§ 264.176 and 270.32(b)).

26 The Permittees shall take precautions during: 1) the treatment or storage of ignitable or reactive  
27 waste; 2) the mixing of incompatible waste; or 3) the mixing incompatible of wastes and other  
28 materials, to prevent reactions that could lead to or cause the following:

- 29       1. generate extreme heat, pressure, fire, explosions, or violent reactions (other than that at
- 30       the Facility's open burn treatment units);
- 31       2. produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to
- 32       threaten human health or the environment;
- 33       3. produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of
- 34       fire or explosions;

- 1 4. damage the structural integrity of the container, tank, permitted unit, or other structure;  
2 and
- 3 5. threaten human health or the environment.

4 The Permittees shall take the following precautions to prevent accidental ignition or reaction of  
5 ignitable or reactive wastes:

- 6 1. ensure that there are no sources of open flames at the container or tank;
- 7 2. segregate and separate by distance ignitable or reactive wastes and protect them from  
8 sources of ignition or reaction such as cutting and welding, hot surfaces, frictional heat,  
9 sparks (e.g., static, electrical, mechanical), spontaneous ignition, and radiant heat;
- 10 3. maintain adequate clearance around fire hydrants that serve permitted units;
- 11 4. use only non-sparking tools when managing hazardous waste containers;
- 12 5. ensure lightning rods are attached to all storage or treatment units;
- 13 6. perform an ongoing inspection, testing, and maintenance of fire protection equipment to  
14 determine appropriate test criteria and preventative maintenance activities;
- 15 7. confine smoking and open flames to designated areas at a minimum of 50 feet from areas  
16 where ignitable or reactive waste is being handled;
- 17 8. stack containers of ignitable and reactive wastes no more than 2 drums high to comply  
18 with the National Fire Protection Association's (NFPA) *Flammable and Combustible*  
19 *Liquids Code*; and
- 20 9. ensure that each fire suppression system is compatible with the hazardous waste being  
21 managed in the permitted unit.

### 22 **2.8.1 Compatibility Precautions**

23 The Permittees shall ensure that a storage container holding a hazardous waste that is incompatible  
24 with any waste or other materials stored nearby in other containers is separated from the other  
25 waste or materials or is protected from them by means of a dike, berm, wall, or other device not to  
26 include the container, in order to, in the event of leakage from containers under conditions  
27 normally incident to storage, prevent the commingling of the incompatible wastes or materials (40  
28 CFR § 264.177(c)).

29 The Permittees shall ensure that incompatible wastes or materials are not stored within or on the  
30 same secondary containment structure.

31 The Permittees shall ensure that all waste and materials are segregated and stored in accordance  
32 with the Department of Transportation's (DOT) compatibility groupings or classes (49 CFR §  
33 177.848).

1 Cyanides and cyanide mixtures or solutions may not be stored with acids if a mixture of the  
2 materials would generate hydrogen cyanide. Class 8 (corrosive) liquids may not be stored above  
3 or adjacent to Class 4 (flammable) or Class 5 (oxidizing) wastes except when it is known that the  
4 mixture of the wastes would not cause a fire or a dangerous evolution of heat or gas.

5 The Permittees shall ensure that hazardous wastes are not placed in an unwashed container or tank  
6 that previously held an incompatible waste or material (40 CFR §§ 264.177(b) or 264.199(b)  
7 respectively).

## 8 **2.9 WASTE MINIMIZATION PROGRAM**

9 The Permittees shall institute a waste minimization program to reduce the volume and toxicity of  
10 hazardous wastes generated by the Facility's operation to the degree determined by the Permittee to  
11 be economically practicable (40 CFR 264.73(b)(9)). The waste minimization program shall  
12 include proposed, practicable methods of treatment and storage currently available to the  
13 Permittees which minimize the present and future threat to human health and the environment.  
14 The Waste Minimization Program shall address or identify the following items:

- 15 1. any written policy or statement that outlines goals, objectives, and methods for source  
16 reduction and recycling of hazardous waste at the Facility;
- 17 2. any employee training or incentive programs designed to identify and implement source  
18 reduction and recycling opportunities for all hazardous wastes;
- 19 3. any source reduction or recycling measures implemented in the last five years or planned  
20 for the next federal fiscal year;
- 21 4. an itemized list of the dollar amounts of capital expenditures (plant and equipment) and  
22 operating costs devoted to source reduction and recycling of hazardous waste;
- 23 5. factors that have prevented implementation of source reduction or recycling;
- 24 6. sources of information on source reduction and recycling received at the Facility (e.g.,  
25 local government, trade associations, suppliers);
- 26 7. an investigation of additional waste minimization efforts that could be implemented at the  
27 Facility that analyzes the potential for reducing the quantity and toxicity of each waste  
28 stream through production process change, production reformulation, recycling, and all  
29 other appropriate means including an assessment of the technical feasibility, cost, and  
30 potential waste reduction for each option;
- 31 8. a flow chart detailing all hazardous wastes (the Facility produces) by quantity, type,  
32 building or area, and program; and
- 33 9. demonstration of the need to use those processes which produce a particular hazardous  
34 waste due to a lack of alternative processes, available technology, or available alternative  
35 processes that would produce less volume or less toxic waste.

1 The Permittees shall submit to the Department a certified report regarding the waste minimization  
2 program annually by December 1<sup>st</sup> for the year ending the previous September 30<sup>th</sup>.

### 3 **2.10 PREPAREDNESS AND PREVENTION**

4 The Permittees shall maintain and operate the Facility in a manner that minimizes the possibility of  
5 fire, explosion or any unplanned sudden or non-sudden release of hazardous wastes or hazardous  
6 constituents to the air, soil, or surface water that could threaten human health or the environment  
7 (40 CFR § 264.31). In addition to the general preparedness and prevention requirements identified  
8 here, the Permittees shall comply with the TA-specific preparedness and prevention requirements  
9 identified in Attachment G (*Container Management*), Attachment H (*Tank Management*), and  
10 Attachment I (*Open Burn Unit Management*).

#### 11 **2.10.1 Required Equipment**

12 At a minimum, the Permittees shall maintain at the Facility and at the permitted units the internal  
13 communication, alarm system devices to summon emergency assistance, fire control, spill control,  
14 and decontamination equipment listed in the tables identifying Facility-wide and site specific  
15 emergency equipment of Attachment D (*Contingency Plan*) (40 CFR § 264.32). The Permittees  
16 shall also maintain at the Facility and at the permitted units the internal communication, alarm  
17 system, spill control, and decontamination equipment referenced in Attachment G (*Container*  
18 *Management*), Attachment H (*Tank Management*), and Attachment I (*Open Burn Unit*  
19 *Management*).

20 The Permittees shall ensure that any changes to the emergency equipment lists adhere to the permit  
21 modification requirements at 40 CFR §§ 270.41 through 270.43 and specifically adhere to the  
22 requirements of 40 CFR § 270.42 Appendix I, Sections B.6.b and B.6.c.

23 The Permittees shall maintain an internal communication or alarm system at all permitted units (40  
24 CFR §§ 264.32(a) and (b)). The communication or alarm systems shall be capable of providing  
25 immediate emergency instruction to facility personnel and summoning emergency assistance.

26 The Permittees shall maintain spill kits at all permitted container storage, tank, and open burn  
27 management units. These spill kits shall be capable of mitigating small containable spills of acidic,  
28 caustic, flammable, and otherwise hazardous waste present at the unit. These kits shall include, at  
29 a minimum, sorbents, neutralizers, shovels, empty containers, and all appropriate personal  
30 protective equipment. For larger spills, the Permittees shall have plugging and diking equipment,  
31 siphon pumps, and loaders readily available at the Facility.

32 The Permittees shall ensure that there is adequate water pressure available to the permitted units to  
33 provide water for fire suppression (40 CFR § 270.32(b)).

34 The Permittees shall operate and maintain the area-wide environmental monitoring network as  
35 specified in Section D.7.3 of Attachment D, (*Contingency Plan*).

36 The Permittees shall maintain equipment at all permitted units capable of mitigating the effects of a  
37 power outage (40 CFR §§ 270.14(b)(8)(iv) and 270.32(b)). This equipment may be either backup

1 batteries or generators (i.e., uninterruptible power systems) and must be capable of operating  
2 evacuation alarms, emergency communication equipment, automatic fire suppression systems, and  
3 lights in buildings without daylight illumination. The Permittees shall ensure that it is possible to  
4 provide fuel to backup generators under adverse conditions.

### 5 **2.10.2 Testing and Maintenance of Equipment**

6 The Permittees shall test and maintain the equipment specified in Permit Section 2.10.1, as  
7 necessary, to ensure its proper operation in time of emergency (40 CFR § 264.33). This equipment  
8 shall undergo, at a minimum, weekly inspection to ensure proper functionality in accordance with  
9 Attachment E (*Inspection Plan*), and conformance with this inspection requirement shall be  
10 documented in the Facility Operating Record.

11 If testing identifies any nonfunctioning communication equipment, alarm system or fire protection  
12 component, spill control, or decontamination equipment, the Permittees shall ensure it is promptly  
13 repaired; they shall immediately provide substitute equipment or systems during repairs. The  
14 Permittees shall ensure that Facility employees and contractors are notified of the presence of  
15 substitute equipment and, if necessary, provide them with proper training of its use (40 CFR §  
16 270.32(b)). The Permittees shall ensure that malfunctioning equipment is clearly marked as “Out  
17 of Use” and that the location of the substitute equipment is clearly posted on or adjacent to the  
18 faulty equipment (40 CFR §§ 264.31 and 270.32(b)).

### 19 **2.10.3 Access to Communications or Alarm System**

20 Whenever hazardous waste is being managed at a permitted unit, the Permittees shall ensure that  
21 all personnel have immediate access to an internal alarm or emergency communication device  
22 either directly or through visual/vocal contact with another employee (40 CFR § 264.34(a)). The  
23 Permittees shall ensure that communication devices are easily accessible without personnel  
24 having to enter another building (40 CFR § 270.32(b)). The Department will consider waste  
25 management to be occurring whenever a person is located at a permitted unit and the unit  
26 contains hazardous waste.

27 The Permittees shall ensure that any employee working alone without the immediate presence of  
28 another employee at the area of operations capable of summoning external emergency assistance  
29 shall have immediate access to a device, such as a hand-held two-way radio, a cell phone, or a  
30 landline telephone (40 CFR § 264.34(b)). The Permittees shall ensure that the communication  
31 device is accessible without the employee having to enter another building.

### 32 **2.10.4 Spill Response**

33 The Permittees shall ensure that spills of hazardous wastes, including small localized spills that  
34 are capable of being managed without the assistance of emergency management personnel, are  
35 managed utilizing the following procedures, not necessarily in the following order:

- 36 1. isolate the immediate area and deny entry to all unauthorized personnel;

- 1        2. contain the spill by spreading sorbents or forming temporary dikes to prevent further  
2            migration;
- 3        3. monitor the spill and fully characterize the spilled waste and contaminated materials;
- 4        4. package the spilled waste and contaminated materials in sound containers; and
- 5        5. decontaminate the area and all involved equipment and personnel.

6        **2.10.5 Arrangements with Local Authorities**

7        The Permittees shall maintain its preparedness and prevention agreement with the Los Alamos  
8        County Emergency Management and Response Office and support agreements with the Los  
9        Alamos County Fire Department, the Los Alamos County Police Department, and the Los  
10       Alamos Medical Center (40 CFR § 264.37).

11       **2.11 CONTINGENCY PLAN**

12       **2.11.1 Implementation of Contingency Plan**

13       The Permittees shall immediately implement Attachment D (*Contingency Plan*) whenever there  
14       is a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or  
15       hazardous constituents (40 CFR § 264.51(b)). The Permittees shall ensure that an adequate  
16       number of trained emergency response personnel are available at all times, including but not  
17       limited to, holidays, nights, and weekends.

18       The Contingency Plan shall be implemented immediately in the following situations:

- 19       1. spills:
  - 20            a. if a hazardous waste spill cannot be contained with secondary containment or  
21            application of sorbents;
  - 22            b. if a hazardous waste spill causes a release of flammable material creating a fire or  
23            explosion hazard; or
  - 24            c. if a hazardous waste spill results in toxic fumes that threaten human health;
- 25       2. explosions:
  - 26            1. if an unplanned explosion involving hazardous waste occurs; or
  - 27            2. if an imminent danger of an explosion involving hazardous waste exists; and
- 28       3. fires:
  - 29            a. if a fire involving hazardous waste occurs; or

- 1           b. if any building, grass, forest, or non-hazardous waste fire exists that threatens to  
2           volatilize or ignite hazardous waste.

3   **2.11.2    Content of the Contingency Plan**

4   The Permittees shall maintain the Contingency Plan to ensure that it at all times accurately  
5   includes the following:

- 6           1. a description of the actions Facility personnel shall take to respond to fires, explosions, or  
7           any unplanned sudden or non-sudden release of hazardous waste or hazardous  
8           constituents to air, soil, and/or surface water at the Facility;
- 9           2. a description of all arrangements agreed upon by local police and fire departments,  
10          hospitals, federal, state, and local emergency response teams, and tribal governments to  
11          coordinate emergency services;
- 12          3. a description of all contracts with emergency response contractors and equipment  
13          suppliers;
- 14          4. the names and phone numbers (i.e., office, home, cell, pager) of a primary and alternate  
15          individual assigned to act as Emergency Coordinator;
- 16          5. a list of all on-site emergency equipment associated with each permitted unit including  
17          fire control, spill control, communication, decontamination, and personal protective  
18          equipment including a description of where this equipment is located, a physical  
19          description of each item on the list, and a brief outline of its capabilities; and
- 20          6. an evacuation plan for Facility personnel where there is a possibility that evacuation may  
21          be necessary, including a description of the signal(s) to be used to begin evacuation as  
22          well as primary and alternate evacuation routes.

23   **2.11.3    Distribution**

24   At a minimum, the Permittees shall maintain copies of the Contingency Plan including all  
25   revisions and amendments at the following locations;

- 26          1. in all appropriate locations at the Facility, including all permitted units;
- 27          2. on the person of the Duty Emergency Manager;
- 28          3. at the Emergency Management and Response Office;
- 29          4. with all entities with which the Permittees have emergency Memorandums of  
30          Understanding, (MOUs) or Mutual Assistance Agreements (MAAs) including: 1) the Los  
31          Alamos County Emergency Management Coordinator; 2) the Los Alamos County Fire  
32          Department; 3) the Los Alamos County Police Department; and 4) the Los Alamos  
33          Medical Center;

- 1       5. with the Department; and
- 2       6. in the Facility Operating Record.

3 Distribution of the Contingency Plan shall be controlled by a system that ensures that all parties  
4 or agencies referenced in the Plan, or who rely upon the Plan, receive current copies of the Plan  
5 within five days of the effective date of this Permit and within five days of receipt of any  
6 Department approval to a modification of the Plan. The Permittees shall ensure that all copies of  
7 the Contingency Plan distributed outside the Facility are sent by certified mail with a return  
8 receipt, or by an equivalent method, demonstrating proper distribution. A record of compliance  
9 with this requirement shall be maintained in the Facility Operating Record (40 CFR § 270.32(b)).

10 The Permittees shall ensure that evacuation routes identified in the Contingency Plan are visibly  
11 and prominently posted at the principle entrances to all permitted units and buildings within  
12 those units (40 CFR § 270.32(b)).

#### 13 **2.11.4 Amendments to Plan**

14 Pursuant to 40 CFR § 264.54, the Permittees shall review the Contingency Plan and amend the  
15 Plan, if necessary, whenever:

- 16       1. this Permit is revised;
- 17       2. the LANL Emergency Management Plan is revised;
- 18       3. the Los Alamos County Emergency Management Plan is revised and that revision is  
19       contrary to a requirement in the Contingency Plan;
- 20       4. a Building Emergency Plan (BEP) for a building which houses a permitted unit is  
21       changed and that change is contrary to a requirement in the Contingency Plan;
- 22       5. the Contingency Plan fails during a drill or an emergency;
- 23       6. the Permittees modify the Facility in either its design, construction, operation,  
24       maintenance, or other circumstances in a manner that increases the potential for fires,  
25       explosions, or releases of hazardous wastes or hazardous waste constituents;
- 26       7. the permitted unit design or operation changes the response necessary in an emergency;
- 27       8. the Permittees modify the list of Emergency Coordinators; or
- 28       9. the Permittees modify the list of emergency response equipment.

29 The Permittees shall ensure that all amendments to the Contingency Plan adhere to the permit  
30 modification requirements at 40 CFR §§ 270.41 through 270.43, including the modification  
31 classifications at 40 CFR § 270.42 Appendix 1, Category B.6.

1 The Permittees shall ensure that appropriate personnel review the Contingency Plan, at a  
2 minimum annually, and log each review in the Facility Operating Record (40 CFR § 270.32(b)).

### 3 **2.11.5 Emergency Manager**

4 The Permittees shall designate a Duty Emergency Manager or Incident Commander who shall be  
5 responsible for coordinating all emergency response measures related to the management of  
6 hazardous wastes. A Duty Emergency Coordinator shall be on call at all times. The Duty  
7 Emergency Coordinator shall be thoroughly familiar with the Contingency Plan and shall have  
8 the authority to promptly commit the personnel and financial resources needed to implement the  
9 Contingency Plan (40 CFR § 264.55).

### 10 **2.11.6 Required Emergency Procedures**

#### 11 **2.11.6.1 Immediate Actions**

12 In the event of an imminent or actual emergency situation, the Group Leader shall immediately  
13 activate the internal facility alarm or communication systems to notify all potentially affected  
14 facility personnel. This person shall also notify the appropriate federal, tribal, state, and local  
15 agencies with designated response roles and implement the other requirements specified in 40  
16 CFR § 264.56 and the Contingency Plan. The Permittees shall ensure that one individual shall  
17 be named as the Incident Commander and the others shall be identified in the order that they will  
18 assume responsibility as alternates.

#### 19 **2.11.6.2 Release, Fire, or Explosion**

20 The Emergency Manager shall, in the event of a fire, explosion, or release of hazardous waste or  
21 constituents:

- 22 1. as soon as practicable, identify the character, exact source, amount, and aerial extent of  
23 any released materials by observation, review of facility records, or by chemical analysis  
24 (40 CFR §§ 264.56(b)); and
- 25 2. assess possible hazards to human health or the environment that may result from the  
26 release, fire, or explosion including both direct and indirect effects of the release, fire, or  
27 explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are  
28 generated, or the effects of any hazardous surface water runoff from water or chemical  
29 agents used to control fire and heat induced explosions) (40 CFR §§ 264.56(c)).

#### 30 **2.11.6.3 Reporting Findings**

31 In the event that the Emergency Manager determines that there has been a release, fire, or  
32 explosion that may threaten the human health or the environment outside the boundaries of the  
33 Facility, he or she shall report the findings as follows:

- 1 1. if an assessment indicates that evacuation of local areas may be advisable, he or she shall  
2 immediately notify the appropriate local and tribal authorities and shall be available to  
3 assist appropriate officials in deciding whether local areas should be evacuated; and
- 4 2. immediately notify to either the government official designated as the on-scene  
5 coordinator for that geographical area, the New Mexico Department of Public Safety  
6 dispatcher (505-827-9329), or the 24-hour National Response Center (800-424-8802).  
7 This notification shall include:
  - 8 a. the name and telephone number of the person reporting the incident;
  - 9 b. the specific Facility location where the incident occurred;
  - 10 c. the time and type of incident;
  - 11 d. the name and quantities, to the extent known, of materials involved;
  - 12 e. the extent of any injuries, if any; and
  - 13 f. the possible hazards to human health and the environment outside the Facility.

#### 14 **2.11.6.4 Mitigative Measures**

15 During an emergency, the Emergency Manager shall take all reasonable measures necessary to  
16 ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous  
17 wastes at the Facility. These measures shall include, where applicable, stopping processes and  
18 operations, collecting and containing released wastes, and removing or isolating containers.

#### 19 **2.11.6.5 Monitoring**

20 In the event that the Facility stops operations in response to a fire, release, or explosion, the  
21 Emergency Manager shall monitor for leaks, pressure buildup, gas generation, or ruptures in  
22 valves, pipes, or other equipment as appropriate.

#### 23 **2.11.7 Post-Emergency Procedures**

24 Immediately after an emergency, the Emergency Manager shall provide for the treatment,  
25 storage, or disposal of recovered wastes, contaminated soils or surface water, or any other  
26 material or contaminated environmental media that resulted from the fire, explosion, or release at  
27 the Facility.

28 The Emergency Manager shall also ensure the following in the affected areas of the Facility:

- 29 1. no waste that may be incompatible with the released material is treated, stored, or  
30 disposed of in the impacted area until cleanup procedures are completed; and
- 31 2. all emergency equipment listed in the Contingency Plan is cleaned and fit for its intended  
32 use before operations are resumed.

1    **2.11.8    Need for Further Corrective Action**

2    If, after implementation of the Contingency Plan in response to a release of a hazardous waste or  
3    constituent, the Department determines that corrective action may be required to address the  
4    release, the Department may require the Permittees to conduct corrective action pursuant to  
5    Permit Part 11 (*Corrective Action*).

6    **2.11.9    Notification and Record Keeping**

7    After implementation of the Contingency Plan in response to a release of a hazardous waste or  
8    hazardous constituent, the Permittees shall notify the Department in compliance with Permit  
9    Section 1.9.12. The Permittees shall notify the Department and appropriate local and tribal  
10    authorities that the Facility is in compliance with Permit Section 2.11.7 before operations resume  
11    in the Facility's affected areas.

12    The Permittees shall record in the Facility Operating Record any instance of fire, explosion, or  
13    release from or at a permitted unit regardless of whether the incident requires implementation of  
14    the Contingency Plan (40 CFR § 270.32(b)).

15    For purposes of unit closure, the Permittees shall document in the Facility Operating Record all  
16    instances where an indoor fire suppression system has been activated resulting in fire  
17    suppressants contacting a waste storage pad, regardless of whether the activation of the fire  
18    suppression system is for an emergency, emergency testing purposes, or the result of an accident  
19    or break in a suppression system (40 CFR § 270.32(b)).

20    **2.12    RECORD KEEPING AND REPORTING**

21    The Permittees shall comply with the record keeping and reporting requirements specified  
22    throughout this Permit and at CFR § 264.73(a).

23    **2.12.1    Manifest Systems**

24    The Permittees shall comply with the manifest requirements of 40 CFR §§ 264.71, 264.72, and  
25    264.76 whenever a shipment of hazardous waste is either received at, or initiated from, the  
26    Facility. The Permittees shall not accept any hazardous waste from an off-site source without an  
27    accompanying manifest.

28    **2.12.2    Operating Record**

29    The Permittees shall maintain a written Facility Operating Record for each permitted unit at the  
30    Facility until the Department has approved either the closure or post-closure certification  
31    statements specified at Permit Sections 9.5 and 10.2.3 respectively (40 CFR § 264.73). For  
32    documents that address the entire Facility (e.g., certifications of a Facility program to reduce the  
33    volume and toxicity of hazardous waste) the Permittees shall maintain these documents until the  
34    Permit is terminated. Unless specifically prohibited by this Permit, an unalterable electronic  
35    record capable of producing a paper copy shall be deemed to be a written record (40 CFR §  
36    270.32(b)).

1 The Permittees shall incorporate into the Facility Operating Record the following information as  
2 soon as it becomes available:

- 3 1. a description of hazardous waste received, stored, or treated, the quantity managed, and  
4 the methods and dates of storage and/or treatment at each permitted unit in accordance  
5 with Appendix I of 40 CFR Part 264, which is incorporated herein by reference;
- 6 2. the location of each type of hazardous waste within each permitted unit and the total  
7 quantity of all wastes and waste types at each unit (the location shall be identified as one  
8 of the permitted units listed in Attachment O (*Hazardous Waste Management Units*) and  
9 any subordinate unit (e.g., room or structure));
- 10 3. records and results of waste analyses and waste determinations that are performed  
11 pursuant to Permit Section 2.4, Attachment C (*Waste Analysis Plan*), and 40 CFR §§  
12 264.1083, 268.7, 268.7(a)(7), and 268.9;
- 13 4. incident reports and details of all incidents that required the implementation of  
14 Attachment D (*Contingency Plan*) as specified in that Plan and Permit Section 11;
- 15 5. records and results of inspections as required in Permit Section 2.6 and Attachment E  
16 (*Inspection Plan*) (these records and results shall be kept for the period specified in  
17 Permit Section 2.6);
- 18 6. monitoring, testing, analytical data, and response actions when required by 40 CFR §§  
19 264.191, 264.193, 264.195, 264.602 , 264.1063(d) through 264.1063(i), 264.1064, and  
20 264.1082 through 264.1090;
- 21 7. notices to off-site generators as specified in 40 CFR § 264.12(b);
- 22 8. all closure cost estimates as specified in Attachment R (*Cost Estimates for Financial*  
23 *Assurance*)(40 CFR § 270.32(b));
- 24 9. an annual certification that there is a Facility program in place to reduce the volume and  
25 toxicity of hazardous waste generated;
- 26 10. for treated wastes, the information contained in the notice and certification required under  
27 40 CFR § 268.7(b);
- 28 11. for wastes left in the ground after closure (i.e., disposal units), the information required of  
29 a treatment facility under 40 CFR § 268.7(b); and
- 30 12. for stored wastes, the notice (or information contained in the notice for wastes generated  
31 on-site) and certification required at 40 CFR § 268.7.

### 32 **2.12.3 Availability of Facility Operating Record**

33 The Permittees shall furnish and make readily available for inspection, upon request by any  
34 officer, employee, or representative of the Department, the Facility Operating Record and all

1 other records required under 40 CFR Part 264 or this Permit (40 CFR § 264.74(a) and pursuant  
2 to 74-4-4.3 NMSA 1978). Information and records requested by the Department pursuant to this  
3 condition shall be made available for inspection in paper or electronic form, or both, as specified  
4 by the Department (40 CFR § 270.32(b)).

#### 5 **2.12.4 Record Retention**

6 The Permittees shall retain all records required in this Permit during the course of any unresolved  
7 enforcement action regarding the Facility or as required by the Department (40 CFR §  
8 264.74(b)).

#### 9 **2.12.5 Biennial Report**

10 The Permittees shall submit a biennial report, which includes all of the information specified in 40  
11 CFR § 264.75 to the Department by March 1<sup>st</sup> of each even numbered year.

#### 12 **2.12.6 Personnel and Telephone Number Changes**

13 The Permittees shall inform the Department in writing of changes in their management personnel  
14 and telephone numbers referenced in this Permit within 15 days of the change.

### 15 **2.13 COST ESTIMATE FOR FACILITY CLOSURE AND POST-CLOSURE**

16 LANS must establish closure and post-closure cost estimates, prepared in accordance with 40  
17 CFR §§ 264.142 and 264.144. Cost estimates must be provided for closure of each unit listed in  
18 Attachment O (*List of Hazardous Waste Management Units*), Table O-1 (*Permitted Unit Actively*  
19 *Managing Hazardous Waste*) and Table O-2 (*Permitted Units Undergoing Post-Closure Care*).  
20 Cost estimates for post-closure care shall be submitted in conjunction with the associated post-  
21 closure care plan for any unit undergoing post-closure care.

22 Attachment R (*Cost Estimates for Financial Assurance*) contains detailed written estimate(s) in  
23 current dollars, of the cost of hiring a third party to perform closure of the units listed in Table O-  
24 1 in Attachment O. LANS shall submit, for Department approval, closure cost estimates for all  
25 units listed in Table O-2 in Attachment O within 180 days of the effective date of this Permit.  
26 The initial Estimated Cost of Work shall include all necessary costs to implement closure in  
27 accordance with the closure requirements included in Permit Part 9 (*Closure*). A third party  
28 means a party who: 1) is neither a parent nor a subsidiary of LANS; and 2) does not share a  
29 common parent or subsidiary with LANS. The Estimated Cost of Work shall not be reduced by  
30 the amount of any salvage value that may be realized from the sale of Facility real property,  
31 structures, equipment, vehicles, product, materials, or other assets associated with the Facility.  
32 The Estimated Cost of Work shall be prepared in accordance with 40 CFR Part 264, Subpart G  
33 and substantially in compliance with the requirements of 40 CFR §§ 264.142 and 264.144.

#### 34 **2.13.1 Adjustments to the Cost Estimates**

35 LANS must adjust the closure and post-closure cost estimates for inflation within 60 days prior  
36 to the anniversary date of the establishment of the financial instrument(s) used to comply with 40

1 CFR §§ 264.143 and 264.145. LANS must adjust the closure and post-closure cost estimates for  
2 inflation within 30 days after the close of the firm's fiscal year and before submission of updated  
3 information to the Department, as specified in 40 CFR §§ 264.142(b) and 264.144(b).

4 **2.13.2 Revision of the Cost Estimate**

5 LANS must revise the closure cost estimates or post-closure cost estimates whenever there is a  
6 change in the Facility's Closure Plan or Post-Closure Care Plan as required by 40 CFR §§  
7 264.142(c) and 264.144(c).

8 **2.13.3 Records of the Cost Estimates**

9 LANS must keep at the Facility records of the latest closure cost estimates and post-closure cost  
10 estimates as required by 40 CFR §§ 264.142(d) and 264.144(d) in accordance with Permit  
11 Section 2.12.

12 **2.14 FINANCIAL ASSURANCE FOR CLOSURE AND POST-CLOSURE**

13 LANS shall establish an instrument(s) for financial assurance no later than 180 days after the  
14 closure and post-closure cost estimate(s) are approved by the Department. LANS shall  
15 demonstrate continuous compliance with 40 CFR §§ 264.143, 264.145, 264.147, and 264.151 by  
16 providing documentation of financial assurance, as required by 40 CFR § 264.151, in at least the  
17 amount of the cost estimates required in Attachment R (*Cost Estimates for Financial Assurance*).  
18 Changes in the financial assurance mechanisms for closure or post-closure care must be  
19 approved by the Department pursuant to 40 CFR §§ 264.143 and 264.145.

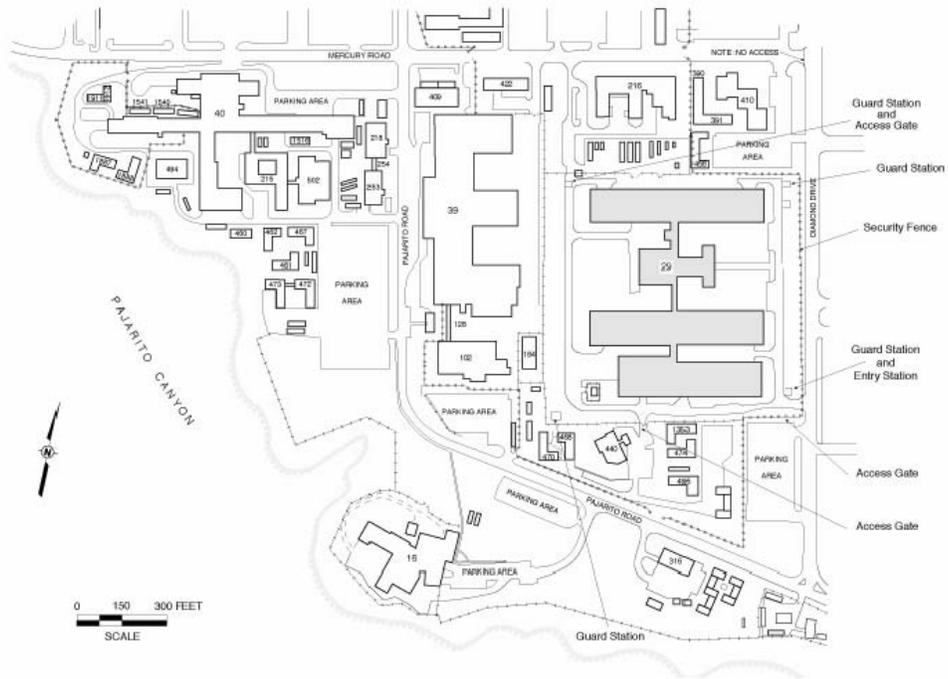
20 **2.15 LIABILITY REQUIREMENTS**

21 LANS shall demonstrate continuous compliance with the requirement of 40 CFR § 264.147(a) to  
22 have and maintain liability coverage for sudden and accidental occurrences in the amount of at  
23 least \$1 million per occurrence, with an annual aggregate of at least \$2 million, exclusive of legal  
24 defense costs. LANS also shall demonstrate continuous compliance with the requirement of 40  
25 CFR § 264.147(b) to have and maintain liability coverage for non-sudden accidental occurrences  
26 in the amount of at least \$3 million per occurrence, with an annual aggregate of at least \$6  
27 million, exclusive of legal defense costs.

28 **2.16 INCAPACITY OF OPERATORS, GURANTORS, OR FINANCIAL**  
29 **INSTITUTIONS**

30 LANS shall comply with 40 CFR § 264.148, whenever necessary, in the case that the  
31 owner/operator, guarantors, or financial institutions become incapable of fulfilling the financial  
32 assurance obligations required by 40 CFR Part 264, Subpart H.

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**Figure 2-1**  
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 3

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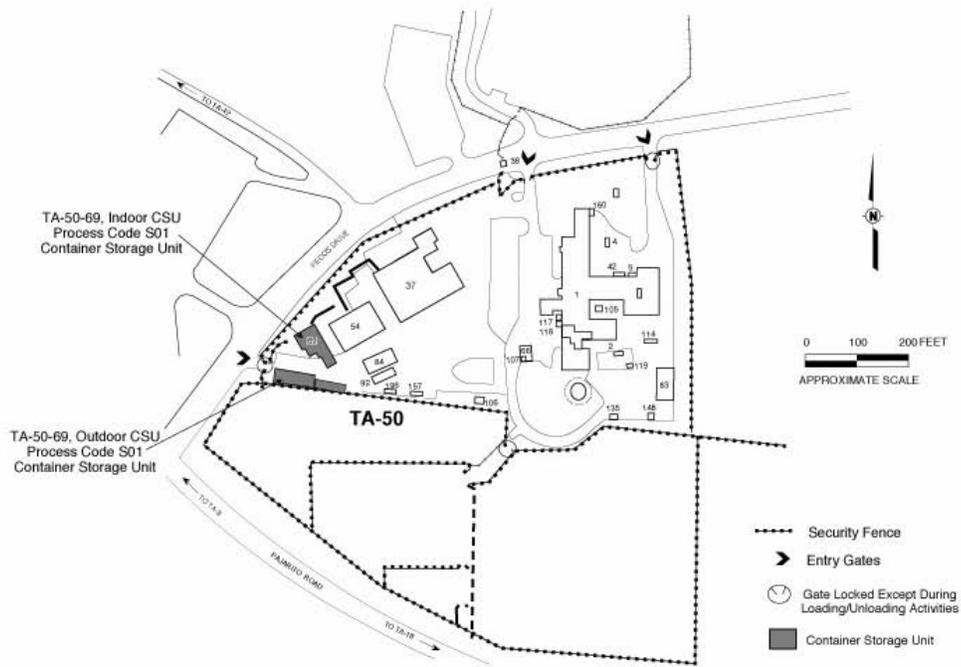


**Figure 2-2**

Location Map of Access Gates, HE Exclusion Area Boundary, and Security Fences in the Vicinity of Technical Area 16

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**Figure 2-3**  
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 50

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Figure 2-4 (Forthcoming in Compliance Schedule)

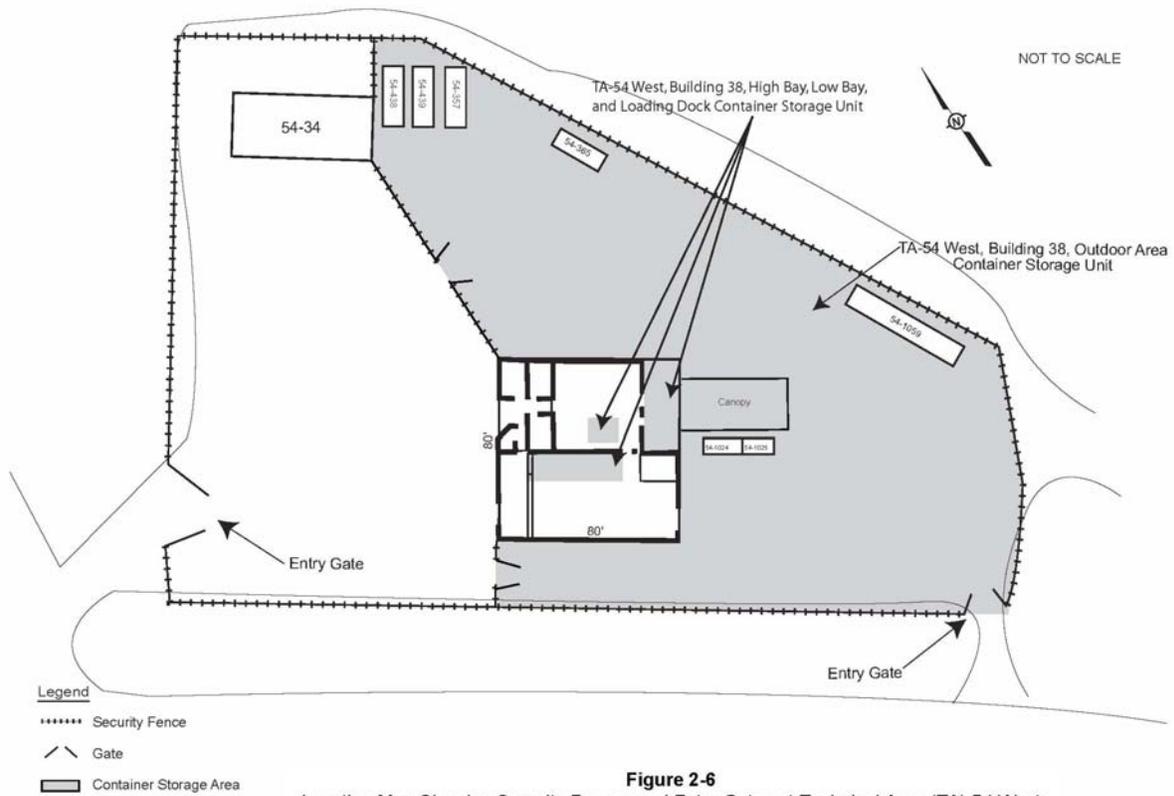
Location map showing security fences and entry gates at Technical Area (TA) 54 Area G

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Figure 2-5 (Forthcoming)

Location map showing security fences and entry gates at Technical Area (TA) 54 Area L

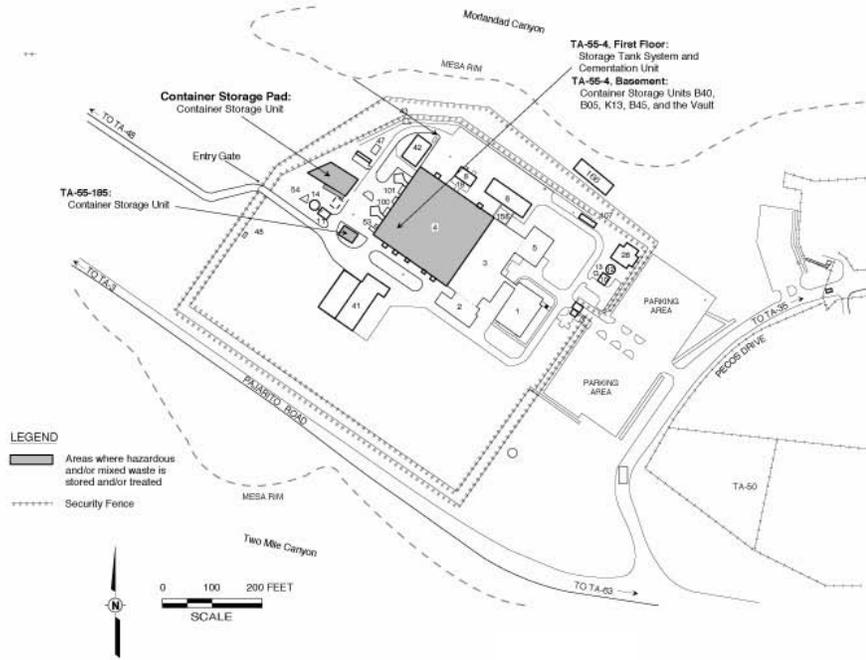
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**Figure 2-6**  
Location Map Showing Security Fences and Entry Gates at Technical Area (TA) 54 West

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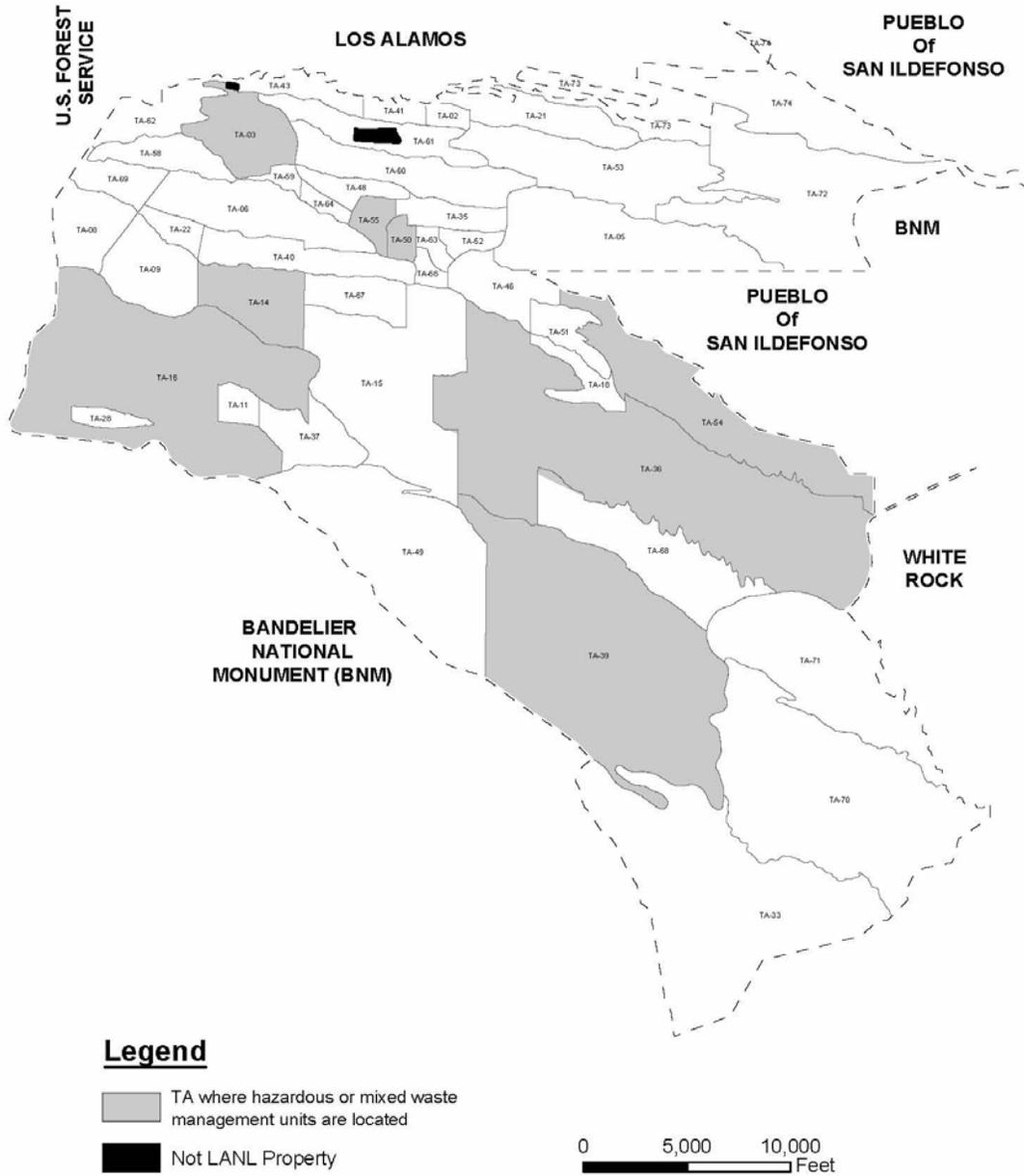
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**Figure 2-7**  
Location Map Showing Security Fences, Entry Gates, and Entry Stations at Technical Area (TA) 55

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**Figure 2-8**  
 Location Map of Los Alamos National Laboratory (LANL) Technical Areas (TAs)

Created by ERGS GIS TEAM, Map Number 06-0108 September 12, 2005  
 State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)  
 This map was created for work processes associated with the Environmental Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff.  
 Boundary of Department of Energy Property Around the Los Alamos National Laboratory, Los Alamos National Laboratory, SSMO Site Planning & Project Initiation, Infrastructure Planning Office, 10 February 2006  
 Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory, Los Alamos National Laboratory, SSMO Site Planning & Project Initiation, 01 February 2003 as captured 07 September 2004.

2

1 **PART 3: STORAGE IN CONTAINERS**

2 **3.1 GENERAL CONDITIONS**

3 The Permittees shall store and otherwise manage containers of hazardous waste in accordance  
4 with the requirements of this Permit Part, in accordance with the requirements of 40 CFR Part  
5 264, Subpart I, which is incorporated herein by reference, in accordance with the requirements of  
6 Part 13 (*TA-50 Specific Permit Conditions*), Part 14 (*TA-54 Specific Permit Conditions*), Part 15  
7 (*TA-55 Specific Permit Conditions*), and Part 16 (*TA-3 Specific Permit Conditions*), and in  
8 accordance with the requirements in Attachment G (*Container Management*).

9 The Permittees shall only store containers at the permitted units identified as utilizing waste  
10 process code S01 and specified in Attachment O (*Hazardous Waste Management Units*), Table  
11 O-1 (*Permitted Units Actively Managing Hazardous Waste*). The Permittees are authorized to  
12 store only those wastes identified by EPA Hazardous Waste Numbers (waste codes) listed in  
13 Attachment B (*Part A Application*) and identified as utilizing waste process code S01. The  
14 Permittees shall not store containers of hazardous waste in excess of the maximum capacities for  
15 each permitted container storage unit identified in Attachment B.

16 **3.2 CONDITION OF CONTAINERS**

17 The Permittees shall ensure that all containers used to store hazardous wastes subject to this  
18 Permit are in good condition (e.g., no severe rusting or apparent structural defects) in accordance  
19 with 40 CFR § 264.171, which is incorporated herein by reference. If a container is not in good  
20 condition or begins to leak, the Permittees shall:

- 21 1. transfer the waste from such a container into a container that is in good condition; and  
22 2. repair or over-pack the container or repackage the waste in a container that is in good  
23 condition.

24 **3.3 ACCEPTABLE STORAGE CONTAINERS**

25 The Permittees shall only use containers that comply with DOT shipping container regulations  
26 (49 CFR § 173 - *Shippers - General Requirements for Shipment and Packaging*, and 49 CFR §  
27 178 - *Specifications for Packaging*) for storage of hazardous waste at CSUs.

28 **3.4 COMPATIBILITY OF WASTE WITH CONTAINERS**

29 The Permittees shall use containers made of, or lined with, materials that are compatible with  
30 and will not react with the hazardous waste to be stored, so that the ability of the container to  
31 contain the waste is not impaired (40 CFR § 264.172).

1 **3.5 MANAGEMENT OF CONTAINERS**

2 The Permittees shall ensure that all containers are kept closed during storage except when waste  
3 is added to or removed from the container or when a container's contents need to be repackaged  
4 (40 CFR § 264.173(a)).

5 The Permittees shall not open, handle, or store a container holding hazardous waste in a manner  
6 that may rupture the container or cause the container to leak (40 CFR 264.173(b)).

7 The Permittees shall establish and maintain lines of demarcation which identify the boundaries  
8 of all container storage area permitted units. The line can be identified by paint, tape, or other  
9 permanent, visible marking on the floor or base material (40 CFR § 270.32(b)). A permanent  
10 fence marking the unit boundary satisfies this requirement.

11 The Permittees shall ensure that drums stored in removable buildings (e.g., modular buildings,  
12 transportainers) with non-grated floors are stored on wheeled drum dollies, steel pallets, or are  
13 otherwise elevated.

14 The Permittees shall ensure that when waste containers are moved during storage their waste  
15 package identification numbers (bar codes), origin and destination, and package changes (e.g.,  
16 over-pack volumes and dimensions) are documented in accordance with Permit Section 2.12 (40  
17 CFR § 264.73(b)(2)).

18 **3.5.1 Storage Configuration and Minimum Aisle Space**

19 The Permittees shall maintain adequate aisle space at all times to allow the unobstructed  
20 movement of personnel, fire protection equipment, spill control equipment, and decontamination  
21 equipment within the permitted CSUs. Additionally, emergency egress aisles with a minimum  
22 aisle space of two feet must be maintained at all personnel doors (40 CFR § 264.35).

23 The Permittees are authorized to stack containers of hazardous waste to a maximum height of 10  
24 feet, 2 inches (40 CFR § 270.32(b)). Containers stacked greater than two high shall be located  
25 on an absolutely level surface.

26 The Permittees shall ensure that hazardous waste containers are not stored within five feet of the  
27 perimeter fence, within five feet of any structure, or within five feet of the paved or unpaved  
28 roadway.

29 The Permittees shall store hazardous waste gas cylinders in cylinder racks, baskets, or on  
30 specially constructed pallets that provide support and restraint.

31 The Permittees shall ensure that hazardous waste containers that are stored outdoors and are not  
32 being actively managed are precluded from contact with precipitation using weather protective  
33 equipment (e.g., containment shell, secured tarp) (40 CFR § 270.32(b)).

1    **3.6    WASTE CONTAINER LABELING**

2    The Permittees shall ensure that all containers storing hazardous waste have a “Hazardous  
3    Waste” label that lists the generator’s name, address, and EPA Identification number, the  
4    accumulation start date, and all applicable EPA Hazardous Waste Number(s). All containers  
5    holding mixed waste shall include a “Radioactive Materials/Radioactive Waste” label. Records  
6    for all containers will be maintained in accordance with Permit Section 2.12.

7    The Permittees shall ensure that all containers not stored on a secondary containment system,  
8    including a secondary containment pallet, are clearly labeled as not containing free liquids (40  
9    CFR § 270.32(b)).

10   **3.7    CONTAINMENT SYSTEMS**

11   **3.7.1    Containers with Free Liquids**

12   The Permittees shall maintain secondary containment systems in all CSUs used to store wastes  
13   which contain free or residual liquids in compliance with 40 CFR § 264.175, which is  
14   incorporated herein by reference. The Permittees shall store containers of hazardous wastes in a  
15   manner that prevents contact with any liquids that may be present within the secondary  
16   containment system.

17   The Permittees shall remove spilled or leaked waste and accumulated precipitation from any  
18   sumps or other collection areas within 24 hours of detection. The Permittees shall maintain the  
19   base of secondary containment systems to ensure they are impervious in order to contain leaks,  
20   spills, and/or accumulated precipitation until the collected liquids are detected and removed. The  
21   Permittees shall also ensure that the containment system have adequate structural strength to  
22   withstand the stresses of daily operations.

23   The Permittees shall seal or coat concrete secondary containment structures with a material that  
24   is compatible with and impervious to the wastes stored in the container storage area. If a coating  
25   or sealant is used, the Permittees shall maintain documentation in the Facility Operating Record  
26   that the coating or sealant was applied in accordance with the manufacturer’s specifications that  
27   includes, but is not limited to, the manufacturer’s specifications and a demonstration that the  
28   coating or sealant was applied in accordance with the manufacturer’s specifications and that the  
29   coating or sealant is re-applied in accordance with the manufacturer’s specifications. If the base  
30   of the containment unit has expansion or construction joints, the Permittees shall install and  
31   maintain chemically resistant water stops, which are embedded in the concrete, or equivalent  
32   external systems (e.g. sealant systems) (40 CFR § 270.32(b)).

33   If a flexible liner is used, the Permittees shall maintain documentation in the Facility Operating  
34   Record that includes, but is not limited to, the manufacturer’s specifications and demonstration  
35   that the flexible liner was installed in accordance with the manufacturer’s specifications and that  
36   the flexible liner is maintained in accordance with the manufacturer’s specifications (40 CFR §  
37   270.32(b)).

1 If the base, liner or coating is cracked or otherwise damaged, the Permittees shall repair the  
2 damage promptly and properly, within 15 calendar days of detecting the problem. The  
3 Permittees shall perform any concrete or asphalt repair using an appropriate repair method (e.g.,  
4 ACI standards or manufacturer's recommendations), which will prevent future damage at the  
5 same location (40 CFR § 264.15(c) & 40 CFR § 270.32(b)). The Permittees shall apply coatings  
6 or sealants, if applicable, to the repaired area before waste storage activities resume. The  
7 Permittees must record any damage or repair to containment systems in the inspection logs  
8 required by Part 2, Section 2.6.3.

### 9 **3.7.2 Containers without Free Liquids**

10 For container storage areas that will only store wastes without free liquids, the Permittees shall  
11 ensure that:

- 12 1. the storage areas are sloped or otherwise designed and operated to drain and remove  
13 liquid resulting from precipitation or other liquids (40 CFR § 264.175(c)(1)); or
- 14 2. the containers are elevated or otherwise protected from contact with accumulated liquids  
15 (40 CFR § 264.175(c)(2)).

16 The Permittees shall comply with the secondary containment requirements for hazardous wastes  
17 that do not contain free liquids and have the following waste codes: F020, F021, F022, F023,  
18 F026 and F027 (40 CFR § 264.175(d)(1)).

19 The Permittees shall ensure that the permitted units identified in Attachment O (*Hazardous*  
20 *Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*),  
21 as managing "non-liquid wastes only" only manage non-liquid wastes.

## 22 **3.8 INSPECTION SCHEDULES AND PROCEDURES**

23 The Permittees shall inspect the permitted container storage units at least weekly for evidence of  
24 leaks or deterioration of the containment system by corrosion, cracking, differential settlement or  
25 other factors (40 CFR § 264.174).

26 The Permittees shall store containers in a manner that allows the containers to be inspected for  
27 leaks, corrosion, deterioration, and for container labels to be read without moving them (40 CFR  
28 § 264.174 & 40 CFR § 270.32(b)).

## 29 **3.9 VOLATILE ORGANIC AIR EMISSIONS**

30 The Permittees shall control air pollutant emissions from each hazardous waste container at a  
31 permitted unit in accordance with the standards specified in 40 CFR §§ 264.1084 and 264.1086,  
32 which are incorporated herein by reference. The Permittees shall also manage hazardous wastes  
33 subject to emission controls in accordance with Attachment G (*Container Management*) and  
34 Attachment E (*Inspection Plan*).

1 The Permittees shall not be required to control air pollutant emissions from a container:

- 2 1. if all hazardous waste entering the container has an average VOC concentration at the  
3 point of origin of the waste of less than 500 ppmw;
- 4 2. if the container manages solely radioactive mixed waste (40 CFR § 264.1080(b)(6)); or
- 5 3. if the container holding the wastes has a total capacity of less than 0.1 cubic meters  
6 (approximately 26 gallons).

7 If the Permittees claim an exemption from air pollution emission controls due to a container  
8 holding radioactive mixed waste, the Permittees shall clearly label the container as containing a  
9 radioactive component.

10 A suitable method to control container air pollution emissions is the utilization of the container  
11 construction specifications and operation requirements at 40 CFR § 264.1086(b). This emission  
12 control method is met if the containers meet the following requirements:

- 13 1. the containers have a capacity of greater than 0.1 cubic meters and less than 0.46 cubic  
14 meters (approximately 119 gallons);
- 15 2. the containers meet U.S. Department of Transportation (DOT) specifications under 49  
16 CFR Part 178;
- 17 3. the containers are kept closed during storage; and
- 18 4. the containers are inspected weekly to ensure lids and openings are securely closed and  
19 there is no possibility of air emissions (40 CFR §§ 264.1086(c)(3) and (4)).

20 Containers may be opened for the purpose of adding or removing waste or as otherwise allowed  
21 at 40 CFR § 264.1086(c)(3).

22 The Permittees shall characterize hazardous wastes subject to emission controls in accordance  
23 with Permit Section 2.4 (*Waste Analysis*) and Attachment C (*Waste Analysis Plan*).

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1 **PART 4: STORAGE IN TANKS**

2 **4.1 GENERAL CONDITIONS**

3 The Permittees shall store hazardous waste in tanks in accordance with the requirements of this  
4 Permit Part, in accordance with 40 CFR Part 264, Subpart J, which is incorporated herein by  
5 reference, in accordance with the TA-55 tank storage specific requirements of Part 15 (*TA-55*),  
6 and in accordance with the requirements specified in Attachment H (*Tank Management*).

7 The Permittees shall store hazardous waste only in those tanks associated with permitted units  
8 identified with process code S02 in Attachment O (*Hazardous Waste Management Units*), Table  
9 O-1 (*Permitted Unit Actively Managing Hazardous Waste*). Further, the Permittees shall store  
10 no more hazardous waste than the operating capacity identified in the Table.

11 The Permittees shall store in tanks only those wastes with the EPA Hazardous Waste Numbers  
12 listed in association with the applicable storage tanks in Attachment B (*Part A Application*).

13 The Permittees shall ensure that hazardous wastes or treatment reagents are not placed in a tank  
14 system if they could cause the tank, its ancillary equipment, or the containment system to  
15 rupture, leak, corrode, or otherwise fail (40 CFR § 264.194(a)).

16 The Permittees shall use appropriate controls and practices to prevent spills and overflows from  
17 tank or containment systems in accordance with 40 CFR § 264.194(b), which is incorporated  
18 herein by reference.

19 **4.2 EXISTING TANK SYSTEM INTEGRITY**

20 The Permittees shall keep in the Facility Operating Record the written integrity assessments of  
21 all existing tank systems provided with the Permittees' Permit Application.

22 **4.3 NEW TANK SYSTEMS**

23 The Permittees shall ensure that during the installation of new tank systems that proper handling  
24 procedures are adhered to in order to prevent damage to the system (40 CFR § 264.192(b)).

25 The Permittees shall ensure that prior to placing a new tank system or component in use, an  
26 independent, qualified, professional engineer registered in the State of New Mexico, trained and  
27 experienced in the proper installation of tank systems or components, inspects the new system in  
28 accordance with the requirements of 40 CFR § 264.192(b), which is incorporated herein by  
29 reference.

30 The new tank system shall be tested for tightness prior to being placed into use (40 CFR §  
31 264.192(d)). If a tank system is found not to be tight, all repairs necessary to remedy the leak(s)  
32 in the system shall be performed prior to the system being placed into use.

1 The Permittees shall obtain and keep in the Facility Operating Record the written statements  
2 required at 40 CFR § 264.192.

### 3 **4.4 RELEASES FROM TANKS**

4 The Permittees shall ensure that all tank systems have associated secondary containment systems  
5 that conform to the requirements specified at 40 CFR § 264.193, which is incorporated herein by  
6 reference.

7 The Permittees shall ensure that spilled, leaked, or otherwise accumulated liquids are removed  
8 from the secondary containment system within 24 hours (40 CFR § 264.193(c)(4)). The  
9 Permittees shall notify the Department of any accumulated liquids within a secondary  
10 containment system within five days of discovery of such liquids (40 CFR § 270.32(b)).

11 The Permittees shall ensure that secondary containment systems comprised in-part by floor, wall,  
12 joint, or penetration sealants, are installed and maintained in accordance with the sealant  
13 manufacturer's recommendations, and that a copy of those recommendations and the Permittees'  
14 records of conforming to those recommendations are maintained in the Facility's Operating  
15 Record (40 CFR § 270.32(b)).

16 The Permittees shall ensure that all ancillary tank equipment (e.g., piping) have secondary  
17 containment in accordance with 40 CFR § 264.193(f), which is incorporated herein by reference.  
18 Above ground waste piping, including welded flanges, joints, and connections, shall be inspected  
19 for leaks each operating day.

20 The Permittees shall ensure that a tank system or secondary containment system from which  
21 there has been a leak or spill, or which is unfit for use, is removed from service immediately and  
22 otherwise complies with the requirements of 40 CFR § 264.196, which is incorporated herein by  
23 reference.

24 The Permittees shall ensure that that any release of a hazardous waste from a tank system to the  
25 environment (e.g., soil, surface water, groundwater, atmosphere) is reported to the Department  
26 within 24 hours of its detection (40 CFR § 264.196(d)). Within 30 days of detection of a release  
27 to the environment, the Permittees shall submit a report to the Department containing the  
28 information at 40 CFR § 264.196(d)(3).

29 The Permittees shall ensure that unless the tank system repair requirements of 40 CFR §§  
30 264.196(e)(2) through (4) can be satisfied to the discretion of the Department, the tank system  
31 will be closed in accordance with 40 CFR § 264.197, which are incorporated herein by reference,  
32 and the conditions of this Permit. If the Permittees repair the tank system, the Permittees shall  
33 certify that the system is capable of handling hazardous wastes without release for the intended  
34 life of the system in accordance with the requirements of 40 CFR § 264.196(f), which is  
35 incorporated herein by reference.

1    **4.5    IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES**

2    The Permittees shall ensure that hazardous waste stabilization units that manage ignitable or  
3    reactive waste do so in accordance with 40 CFR § 264.198, which is incorporated herein by  
4    reference.

5    The Permittees shall ensure that incompatible wastes, or incompatible wastes and materials, are  
6    not placed in the same tank system (40 CFR § 264.199).

7    **4.6    VOLATILE ORGANIC AIR EMISSIONS**

8    The Permittees shall control air pollutant emissions from each hazardous waste tank at a  
9    permitted unit in accordance with the standards specified in 40 CFR §§ 264.1084 and 264.1086,  
10   which are incorporated herein by reference. The Permittees shall also manage hazardous wastes  
11   subject to emission controls in accordance with Attachment H (*Tank Management*) and  
12   Attachment E (*Inspection Plan*).

13   The Permittees shall not be required to control air pollutant emissions from a tank under the  
14   following circumstances:

- 15       1. if all hazardous waste entering the tank has an average VO concentration at the point of  
16       origin of the waste of less than 500 ppmw; or
- 17       2. if the tank manages solely radioactive mixed waste (40 CFR § 264.1080(b)(6)).

18   If the Permittees claim exemption from air pollution emission controls due to a tank managing  
19   radioactive mixed waste, the Permittees shall clearly label the tank as containing a radioactive  
20   component (40 CFR § 270.32(b)).

21   The Permittees shall characterize hazardous wastes subject to emission controls in accordance  
22   with Permit Section 2.4.

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1 **PART 5: TREATMENT BY STABILIZATION**

2 **5.1 GENERAL CONDITIONS**

3 The Permittees shall treat hazardous waste by stabilization in accordance with the requirements  
4 of this Permit Part, in accordance with 40 CFR Part 264, Subpart X, which is incorporated herein  
5 by reference, and in accordance with the requirements specified in Attachment J (*Stabilization*  
6 *Unit Management*).

7 The Permittees shall treat hazardous waste by stabilization only in those permitted units  
8 identified with process code X01 in Attachment O (*Hazardous Waste Management Units*), Table  
9 O-1 (*Permitted Units Actively Managing Hazardous Waste*). The Permittees shall treat no more  
10 hazardous waste at a stabilization unit than the operating capacity identified in the Table.

11 The Permittees shall treat in a stabilization unit only those waste with the EPA Hazardous  
12 Wastes Numbers listed in association with the applicable treatment unit in Attachment B (*Part A*  
13 *Application*).

14 The Permittees shall ensure that hazardous waste to treatment reagents are not placed in the  
15 treatment system in they could cause the system or its containment system to rupture, leak,  
16 corrode, or otherwise fail (40 CFR § 264.194(a)).

17 The Permittees shall use appropriate controls and practices to prevent spills and overflows from  
18 the treatment system (40 CFR § 264.194(b)).

19 **5.2 RELEASES FROM STABILIZATION UNITS**

20 The Permittees shall ensure that all stabilization units have associated secondary containment  
21 systems that conform to the requirements specified at 40 CFR § 264.193, which is incorporated  
22 herein by reference.

23 The Permittees shall ensure that spilled, leaked, or otherwise accumulated liquids are removed  
24 from the secondary containment system within 24 hours (40 CFR § 264.193(c)(4)). The  
25 Permittees shall notify the Department of any accumulated liquids within a secondary  
26 containment system within five days of discovery of such liquids (40 CFR § 270.32(b)).

27 The Permittees shall ensure that secondary containment systems comprised in part by floor, wall,  
28 joint, or penetration sealants, are installed and maintained in accordance with the sealant  
29 manufacture's recommendations, and that a copy of those recommendations and the Permittees'  
30 records of conforming to those recommendations are maintained in the Facility's Operating  
31 Record (40 CFR § 270.32(b)).

32 The Permittees shall ensure that all ancillary stabilization unit equipment (e.g., piping) have  
33 secondary containment in accordance with 40 CFR § 264.193(f), which is incorporated herein by  
34 reference. Above ground waste piping, including welded flanges, joints, and connections, shall  
35 be inspected for leaks each operating day.

1 The Permittees shall ensure that a stabilization unit or associated secondary containment system  
2 from which there has been a leak or spill, or which is unfit for use, is removed from service  
3 immediately and otherwise complies with the requirements of 40 CFR § 264.196, which is  
4 incorporated herein by reference.

5 The Permittees shall ensure that that any release of a hazardous waste from a stabilization unit to  
6 the environment (e.g., soil, surface water, groundwater, atmosphere) is reported to the  
7 Department within 24 hours of its detection (40 CFR § 264.196(d)). Within 30 days of detection  
8 of a release to the environment, the Permittees shall submit a report to the Department containing  
9 the information at 40 CFR § 264.196(d)(3).

### 10 **5.3 VOLATILE ORGANIC AIR EMISSIONS**

11 The Permittees shall ensure that all hazardous wastes treated in stabilization units are done so in  
12 accordance with 40 CFR Part 264, Subparts BB and CC, which are incorporated herein by  
13 reference.

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## **PART 6: TREATMENT BY OPEN BURNING**

### **2 6.1 GENERAL CONDITIONS**

3 The Permittees shall conduct open burning operations in accordance with this Permit Part, in  
4 accordance with 40 CFR Part 264, Subpart X and 40 CFR §§ 268.7(b) and 270, which are  
5 incorporated herein by reference, in accordance with Permit Part 12 (*TA-16*), and Attachment I  
6 (*Open Burn Unit Management*).

7 The Permittees shall treat by open burning only those hazardous wastes that have an explosive  
8 component in order to remove the characteristics of reactivity (D003) and ignitability (D001).

9 The Permittees shall not treat by open burning any hazardous waste containing a radionuclide  
10 component (40 CFR § 270.32(b)).

11 The Permittees shall limit open burning treatment activities to waste that would result in  
12 detonation or deflagration .This includes the following HE-contaminated materials:

- 13 1. water;
- 14 2. solvent waste;
- 15 3. used oil;
- 16 4. solid and scrap;
- 17 5. commercial chemical products;
- 18 6. wet HE;
- 19 7. solid waste;
- 20 8. equipment; and
- 21 9. liquid acids, bases, and/or inorganic salt solutions.

### **22 6.2 MANAGEMENT OF OPEN BURNING UNITS**

23 The Permittees shall maintain run-on and run-off controls (40 CFR § 270.14(b)(8)(ii)), including  
24 the following structures:

- 25 1. berms or ditches of sufficient size up-gradient of the OB unit to prevent run-on;
- 26 2. covers to prevent precipitation from contacting treatment residue (thus preventing residue  
27 run-off); and

- 1        3. berms or ditches of sufficient size down-gradient of the OB unit to ensure proper  
2        drainage run-off.
- 3        The Permittees shall ensure burning operations occur during daylight hours only (i.e., from one-  
4        hour after sunrise to one-hour before sunset).
- 5        The Permittees shall ensure burning operations occur when wind speed ranges do not exceed 15  
6        mph.
- 7        The Permittees shall ensure that burning operations do not occur when an electrical storm(s)  
8        exists within three miles of the permitted unit.
- 9        The Permittees shall ensure that burning operations do not occur during precipitation or  
10       inclement weather or if storms are forecasted for the location of the permitted unit within a four-  
11       hour period.
- 12       The Permittees shall ensure that burning operations do not occur during a weather inversion or if  
13       an inversion is forecasted for the location of the permit unit within a four-hour period.
- 14       The Permittees shall remove any and all combustible material at a minimum radius of 200 ft  
15       from the open burn treatment location as a fire prevention measure.
- 16       The Permittees shall ensure that wastes be placed in the open burn treatment unit only if  
17       treatment is planned within four hours. If oversized equipment requires complex staging, the  
18       Permittees may stage the equipment on a burn pad for 48-hours and the Department will not  
19       consider the staging inappropriate storage; however the equipment and the unit must be covered.
- 20       The Permittees shall maintain a minimum temperature of 400 degrees Celsius during open  
21       burning to ensure complete thermal degradation of HE wastes.
- 22       The Permittees shall use secondary containment (i.e., additional pan or tray) when burning HE-  
23       contaminated liquids.
- 24       The Permittees shall cover the containment devices (e.g., pans, trays, or flash pads) within eight  
25       hours of the last open burn event while awaiting collection of treatment residue.
- 26       The Permittees shall clean open burn unit containment devices of any treatment residue within  
27       24 hours after any open burning event. These residues shall be managed as a hazardous waste  
28       until determined otherwise based on waste analyses.
- 29       The Permittees shall wait a minimum of 24 hours between open burning events before burn  
30       pan/flash pad reuse to allow the surface to cool.
- 31       The Permittees shall cover open burn unit containment devices (e.g., pans, trays, or flash pads)  
32       when not in use to prevent the collection and runoff of precipitation.

1   **6.3   GENERAL CLOSURE REQUIREMENTS**

2   At the time of closure, the Permittees shall meet the closure performance standards outlined in  
3   Permit Part 9, Section 9.3 for any open burn unit at the Facility, or any portion of an open burn  
4   unit, in accordance with this Permit Part, 40 CFR §§ 264.110 through 264.116, 40 CFR Part 264,  
5   Subpart X, incorporated herein by reference, and any applicable portions of Permit Part 12 and  
6   Attachment K (*Closure Plan*).

7   The Permittees shall collect soil samples at the open burn units at the surface and at depths of  
8   three and five feet below ground surface directly adjacent to the pad sides (in the center), and at  
9   the four corners, as well as directly beneath any sumps, drains, or catch basins. If contamination  
10  is detected five feet below ground surface, the Permittees shall collect samples at two-foot  
11  intervals below the five-foot depth until contamination is no longer detected in order to define  
12  the vertical extent of contaminant releases.

13  The Permittees shall delineate the horizontal extent of contamination by repeating the sampling  
14  protocol by moving away from the unit along lines emanating from the center of the unit to the  
15  next sampling location at 20-foot intervals beyond any location where contamination is detected.  
16  All soil samples shall be submitted to a contract laboratory for analysis of explosive compounds,  
17  perchlorate, VOCs, SVOCS, and Target Analyte List (TAL) metals. Sampling and analysis  
18  procedures shall conform to Attachment C (*Waste Analysis Plan*).

19  In the event clean closure of an open burn unit cannot be achieved, the Permittees shall submit to  
20  the Department a post-closure care plan for the site in accordance with Permit Part 10 and as  
21  required by 40 CFR §§ 264.117 through 264.120. The Post-Closure Care Plan must provide  
22  provisions to stabilize the site as part of a permit modification request that includes, but is not  
23  limited to, planned monitoring activities, inspection and maintenance activities, and the  
24  frequencies at which these activities will be performed.

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**PART 7: (RESERVED)**

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**PART 8: (RESERVED)**

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1 **PART 9: CLOSURE**

2 **9.1 GENERAL CONDITIONS**

3 At the time of closure of storage and treatment units, the Permittees shall meet the closure  
4 performance standards outlined in Permit Section 9.3 at any permitted unit at the Facility, or any  
5 portion of a permitted unit, in accordance with 40 CFR §§ 264.110 through 264.116, 264.178,  
6 264.197, 264.228, 264.310, 40 CFR Part 264, Subpart X (all are incorporated herein by  
7 reference), this Permit Part, and any applicable portions of Permit Parts 3, 4, 5, 6, 12, 13, 14, 15,  
8 and 16, and Attachment K (*Closure Plan*). If, upon completion of closure at any unit, the clean  
9 closure performance standard defined in Permit Section 9.3 is not achieved, the Permittees shall  
10 submit a Permit modification request to the Department to conduct post-closure care. For  
11 disposal units (TA-54 Areas L, G & H), the Permittees shall conduct such corrective action and  
12 closure activities as required by the Department under the Consent Order (Order) and this Permit  
13 Part (9), respectively, and submit a permit modification request for a post-closure care permit (40  
14 CFR § 270.32(b)).

15 If a permitted unit undergoing closure is situated among solid waste management units (SWMU)  
16 or areas of concern (AOC) and cannot achieve clean closure as defined in Permit Section 9.3,  
17 clean-up of the permitted unit shall be coordinated with corrective action for the SWMUs or  
18 AOCs in accordance with 40 CFR § 264.110(c)(1), which is incorporated herein by reference.

19 The Permittees shall close open burning units in accordance to the requirements in this Permit  
20 Part as well as those conditions included in Permit Part 6 (*Treatment by Open Burning*) and Part  
21 12 (*TA-16 Specific Permit Requirements*).

22 **9.2 STORAGE AND TREATMENT UNITS**

23 With respect to closure of each permitted storage and treatment unit, the Permittees shall abide  
24 by the following requirements.

25 **9.2.1 Closure Plan**

26 For every permitted unit at the Facility, the Permittees shall submit a Closure Plan to the  
27 Department for approval which identifies all steps necessary to perform closure. The Permittees  
28 shall prepare the Closure Plans in accordance with 40 CFR § 264.112, incorporated herein by  
29 reference, and include all of the requirements addressed in Permit Sections 9.2.4 (*Closure*  
30 *Activities for Indoor Storage and Treatment Units*) and 9.2.5 (*Closure Activities for Outdoor*  
31 *Storage and Treatment Units*). The Closure Plans shall, at a minimum, describe how each  
32 permitted unit, or portion of a permitted unit, will be closed to meet the closure performance  
33 standards. The Permittees shall include in each Closure Plan a Sampling and Analysis Plan  
34 (SAP) for each permitted unit based on Permit Section 9.2.1.1. The Department must approve  
35 all SAPs before sampling activities begin.

36 The Permittees shall establish a comprehensive list of contaminants of potential concern for each  
37 permitted unit undergoing closure by identifying the following:

- 1 1. all hazardous wastes managed within the permitted unit; and
- 2 2. all hazardous constituents contained within those wastes.

3 The comprehensive list of contaminants of potential concern shall be utilized to select the  
4 analytical methods capable of detecting the contaminants associated with the unit.

5 The Permittees shall submit detailed Closure Plans for each permitted unit incorporating all the  
6 requirements identified in this Permit Part in the form of a Class 3 permit modification request.  
7 The Permittees shall submit these Closure Plans for each permitted unit at the TAs listed below  
8 in accordance with the following schedule:

- 9 1. TA-54 Area L and TA-50 – within 90 days of the effective date of this Permit;
- 10 2. TA-54 Area G and TA-55 – within 180 days of the effective date of this Permit; and
- 11 3. TA-54 West, TA-3, and TA-16 – within 270 days of the effective date of this Permit.

12 The Permittees shall include in each permitted unit's Closure Plan a schedule for completing the  
13 requirements in this Permit Part in accordance with 40 CFR § 264.112(b)(6), which is  
14 incorporated herein by reference.

15 The Permittees may propose additional or alternate sampling activities in the SAP that address  
16 unit-specific conditions.

#### 17 **9.2.1.1 Sampling and Analysis**

18 The Permittees' SAP shall provide for:

- 19 1. verification sampling to ensure that equipment, structures, and/or buildings are  
20 decontaminated and to determine whether there has been a release of hazardous  
21 constituents to environmental media;
- 22 2. investigative sampling if a release of hazardous constituents to environmental media is  
23 identified in step 1 above in order to determine the nature and extent of the release; and
- 24 3. confirmatory sampling to confirm completion of clean-up of media affected by any such  
25 release.

26 All SAPs shall, at a minimum, include:

- 27 1. *Number and locations of the verification/ investigative/confirmatory samples to be*  
28 *collected.* The rationale for the number and locations of samples proposed that will  
29 confirm achievement of the closure performance standard and a site plan depicting the  
30 boundaries of the regulated unit as well as sampling locations (e.g., sumps, catch basins,  
31 conveyance systems, and other potential release locations, and locations of spills or other  
32 releases of hazardous waste or hazardous constituents during operation of the unit);

- 1        2. *Type of verification/ investigative/confirmatory samples.* The type of samples to be  
2        collected (e.g., wash-water, swipe, core, chip, soil) and the rationale for the selection of  
3        sample types;
- 4        3. *Field sampling methods.* A description of the methods and procedures that will be used  
5        to collect each type of sample;
- 6        4. *Quality Assurance Procedures.* A description of the quality assurance/quality control  
7        procedures that include, but are not limited to:
  - 8            a. duplicates, trip blanks, equipment blanks;
  - 9            b. a description of methods for decontamination of re-usable sampling equipment;
  - 10           c. a description of all sample preservation, handling, labeling, and chain-of-custody  
11           procedures;
- 12       5. *Contaminants of Potential Concern.* A list of contaminants of potential concern that the  
13       Permittees shall sample; and
- 14       6. *Cleaning Solutions.* The Permittees shall make certain that all cleaning solutions to be  
15       used during closure are identified in the unit-specific Sampling and Analysis Plan.

## 16    **9.2.2        Amendment of the Closure Plan**

17    The Permittees shall submit a permit modification request to authorize a change in the approved  
18    Closure Plan upon the occurrence of events listed in 40 CFR §§ 264.112(c)(1) - (4) and 270.42,  
19    which are incorporated herein by reference. The written request must include a copy of the  
20    amended Closure Plan and all proposed modifications to the Plan.

## 21    **9.2.3        Closure Schedule**

### 22    **9.2.3.1        Notification of Closure**

23    The Permittees shall notify the Department in writing at least 45 days prior to the date on which  
24    they expect to begin partial or final closure of a permitted unit, or a portion of a unit, according  
25    to 40 CFR § 264.112(d)(1), which is incorporated herein by reference. The Permittees shall  
26    begin closure of a permitted unit no later than 30 days after the date on which the unit receives  
27    the known final volume of hazardous waste or, if there is a reasonable possibility that the  
28    permitted unit will receive additional hazardous wastes, no later than one year after the date on  
29    which the unit received the most recent volume of hazardous wastes, in accordance with 40 CFR  
30    § 264.112(d)(2)(i).

### 31    **9.2.3.2        Time Allowed for Closure**

32    The Permittees shall complete all partial or final closure activities in compliance with this Permit  
33    Part within 180 days after receiving the final volume of hazardous waste at a permitted unit

1 unless an extension is approved by the Department (40 CFR §§ 264.113(a)(1) and (2) or  
2 264.113(b)(1) and (2), which are incorporated herein by reference).

### 3 **9.2.4 Closure Activities for Indoor Storage and Treatment Units**

4 The Permittees shall outline, and implement at closure, the procedures in Permit Sections 9.2.4.1  
5 through 9.2.4.8 in each unit-specific Closure Plan in order to ensure attainment of the closure  
6 performance standards at Permit Section 9.3.

#### 7 **9.2.4.1 Removal of Hazardous Waste**

8 Within 90 days after receiving the final volume of hazardous waste at a permitted unit, the  
9 Permittees shall treat, remove from the unit, or dispose of on-site, all hazardous waste in  
10 accordance with a Department approved Closure Plan (40 CFR §§ 264.113 and 264.178 (which  
11 are incorporated herein by reference)).

#### 12 **9.2.4.2 Records Review and Structural Assessment**

13 The Permittees shall conduct a records review for, and a structural assessment of, each permitted  
14 unit prior to closure. The Permittees shall, during the records review, update the list of COPCs  
15 in Section 9.2.1(2) to accurately reflect the hazardous wastes managed at the unit.

16 The Permittees shall review the permitted unit's Operating Record, including but not limited to,  
17 inspection and contingency plan implementation records, to determine if any spills, defects,  
18 deterioration, damage, or hazards affecting waste containment occurred or developed during the  
19 life of the unit. If the records indicate any such problems (e.g., spills or releases, damage to the  
20 flooring or other building materials) the Permittees shall include these sites in the SAP as sample  
21 locations for release assessment purposes (40 CFR § 270.32(b)).

22 The Permittees shall notify the Department a minimum of 60 calendar days prior to conducting  
23 the structural assessment of the unit to be closed to provide the Department the opportunity to  
24 participate in the unit's physical condition review. If the assessment reveals any evidence of  
25 release (e.g., staining) to the flooring or building materials, the Permittees must also incorporate  
26 these sample locations into the SAP (40 CFR § 270.32(b)).

27 Upon completion of the structural assessment and records review, the Permittees shall submit an  
28 updated SAP in the Closure Plan (Permit Section 9.2.2) for the permitted unit to be closed in  
29 accordance with the requirements in this Permit Section and Permit Sections 9.2.4.6 and 9.2.5.6  
30 which includes all additional sampling locations, methods, and procedures identified as  
31 necessary during the records review and structural assessment (40 CFR § 264.112(c)).

#### 32 **9.2.4.3 Decontaminate or Remove all Structures and Equipment at Units Undergoing** 33 **Closure**

34 The Permittees shall decontaminate all equipment (e.g., moveable equipment, ventilation  
35 systems, secondary containment pallets, transportainers) and structures (e.g., walls, floors,  
36 ceilings, stairs, railings) associated with the permitted unit being closed in accordance with the

1 requirements for Closure Plans in 40 CFR §§ 264.112(b)(4) and 264.114, which are incorporated  
2 herein by reference.

3 The Permittees shall decontaminate all structures and equipment by pressure washing or steam  
4 cleaning. The Permittees shall ensure that washing activities are repeated until decontamination  
5 is verified in accordance with Permit Section 9.2.4.6 (40 CFR § 270.32(b)). The Permittees shall  
6 ensure that any structures or equipment that cannot be decontaminated are removed (or  
7 containerized) in accordance with 40 CFR § 264.114, which is incorporated herein by reference,  
8 and managed in compliance with all applicable waste management regulations (Permit Section  
9 9.2.4.5). All cleaning solutions used to decontaminate buildings, structures, and equipment shall  
10 be containerized, characterized, and managed in compliance with all applicable waste  
11 management regulations.

#### 12 **9.2.4.4 Disposal Procedures**

13 The Permittees shall dispose of any equipment, structures, decontamination waste, and  
14 environmental media associated with the permitted unit being closed that could not be  
15 decontaminated in accordance with this Permit Part and 40 CFR § 264.114, which is  
16 incorporated herein by reference. This includes but is not limited to:

- 17 1. demolished debris;
- 18 2. contaminated media (e.g., soils);
- 19 3. containerized waste; and
- 20 4. decontamination waste.

21 The Permittees shall comply with all applicable state, federal, and local requirements for the  
22 disposal of waste generated during closure activities.

#### 23 **9.2.4.5 Management of Waste Generated During Closure**

24 By removing any hazardous wastes or hazardous waste constituents during partial or final  
25 closure, the Permittees become a generator of hazardous waste. The Permittees shall manage the  
26 waste in compliance with all applicable waste management regulations (40 CFR § 264.114).

#### 27 **9.2.4.6 Verification Sampling**

28 After decontamination and removal (Permit Section 9.2.4.3) the Permittees shall conduct  
29 verification sampling activities, as described in this Permit Section, and include them in each  
30 permitted unit's SAP. Such verification sampling activities will ensure the decontamination of  
31 equipment and structures and assist the Permittees in determining whether a release of hazardous  
32 constituents to environmental media has occurred.

33 The Permittees shall collect one sample every 250 square feet in loading and unloading zones,  
34 and one sample every 500 square feet on walls and floors of the permitted unit. The type of

1 sample collected (e.g., wash-water, swipe, chip, core, soil) shall depend on the material being  
2 sampled and the constituents being analyzed. The Permittees shall provide the rationale for  
3 proposing the types of samples to be collected.

4 The Permittees shall collect samples at locations identified during the records review and  
5 structural assessment where stains, cracks, gaps, or other damaged conditions are present as well  
6 as where the Operating Record indicates any instances of spills or releases.

7 If samples collected from any equipment or surfaces indicate the presence of contamination  
8 above Department approved closure performance standards included in Permit Section 9.3, the  
9 contaminated area must be re-washed and re-sampled. The Permittees shall continue this process  
10 until decontamination is achieved or it is determined that Permit Section 9.3 standards cannot be  
11 attained.

12 If verification samples on floors detect hazardous constituents, the Permittees shall follow the  
13 release investigation procedures identified in Permit Section 9.2.4.7.

14 The Permittees shall collect one swipe sample for every 10 feet of exposed piping (40 CFR §  
15 270.32(b)).

16 At container storage units, the Permittees shall decontaminate the entire room, including but not  
17 limited to walls, floors, ceilings, and include these sites in the sampling area grid locations (40  
18 CFR § 270.32(b)).

19 The Permittees may collect swipe samples analyzed for radionuclides for use as indicators of  
20 contaminant releases in units where radionuclides were stored. The Permittees shall not however  
21 use these as surrogates for validation of clean closure at permitted units (40 CFR § 270.32(b)).

22 If the Permittees plan to demolish the permitted structure or building, then an alternate sampling  
23 approach shall be proposed in the SAP. In this case, the Permittees shall follow the soil  
24 verification sampling procedures identified in Permit Section 9.2.5.6 (40 CFR § 270.32(b)).

25 The Permittees' verification samples in zones constructed of asphalt or asphaltic concrete shall  
26 consist of collecting soil samples from the subgrade and soils beneath the asphalt at intervals  
27 approved by the Department. If verification soil samples detect contamination, the Permittees  
28 shall remove all of the asphalt (or asphaltic concrete) and follow the soil contamination  
29 investigation procedures identified in Permit Section 9.2.4.7.

#### 30 **9.2.4.7 Investigative Sampling to Determine the Extent of a Release**

31 The Permittees must determine the extent of any releases of contamination detected during closure  
32 activities if contamination is discovered. If contamination is discovered at any sampling point, the  
33 Permittees shall determine the extent of the contamination by collecting and analyzing samples of  
34 the surrounding and underlying soils. The Permittees shall collect additional samples, if soil  
35 contamination in these samples is detected, in order to determine both the lateral and vertical  
36 extent of contamination of any release from the permitted unit (40 CFR § 270.32(b)).

1    **9.2.4.8       Confirmatory Sampling to Confirm Clean-Up**

2    The Permittees shall remove all contaminated media if samples collected from beneath any  
3    permitted unit indicate the presence of hazardous constituents above levels established in Permit  
4    Part 11 (*Corrective Action*). After removal, the Permittees shall demonstrate via confirmatory  
5    sampling that clean-up levels stated in Permit Section 9.3 and Permit Part 11 have been achieved  
6    (40 CFR § 264.114).

7    **9.2.5        Closure Activities for Outdoor Storage Units**

8    The Permittees shall outline, and implement at closure, the procedures in Permit Sections 9.2.5.1  
9    through 9.2.5.8 in each unit-specific Closure Plan in order to ensure attainment of the closure  
10   performance standards specified at Permit Section 9.3.

11   **9.2.5.1       Removal of Hazardous Waste**

12   Within 90 days after receiving the final volume of hazardous waste at a permitted unit, the  
13   Permittees shall treat or remove from the unit all hazardous waste in accordance with 40 CFR §  
14   264.112 through 114, which are incorporated herein by reference.

15   **9.2.5.2       Records Review and Structural Assessment**

16   The Permittees shall conduct the records review and structural assessment for outside storage  
17   units in accordance with Permit Section 9.2.4.2.

18   **9.2.5.3       Decontaminate or Remove all Structures and Equipment at Units Undergoing**  
19                    **Closure**

20   The Permittees shall follow the decontamination and removal requirements outlined in Permit  
21   Section 9.2.4.3.

22   **9.2.5.4       Disposal Procedures**

23   The Permittees shall dispose of all wastes generated during closure of outdoor storage units in  
24   accordance with Permit Section 9.2.4.4.

25   **9.2.5.5       Management of Waste Generated During Closure**

26   The Permittees shall manage all remediation waste in accordance with Permit Section 9.2.4.5.

27   **9.2.5.6       Verification Sampling**

28   After decontamination and removal as discussed in Permit Section 9.2.5.3, the Permittees shall  
29   conduct the following verification sampling activities to determine if environmental media at the  
30   permitted unit has been contaminated as a result of waste management operations.

31   The Permittees shall provide in the SAP one sample every 250 square feet in loading and  
32   unloading zones and one sample for every 500 square feet in the storage areas. The type of sample

1 collected (e.g., swipe, building materials, core, soil) shall depend on the material being sampled  
2 and the chemical analyses being conducted.

3 The Permittees shall collect a soil sample at the interface of fill and native soil or tuff beneath all  
4 areas associated with water catchments or conveyances including, but not limited to, sumps, catch  
5 basins, secondary containment areas, and drains (40 CFR § 270.32(b)).

6 The Permittees shall collect a soil sample at the interface of fill and native soil or tuff beneath any  
7 underground piping at 10 foot intervals and outfall discharge locations (40 CFR § 270.32(b)).

8 The Permittees shall collect soil samples at the locations of all cracks, gaps, and all other locations  
9 where damage to the unit structure has occurred, and at all locations where staining or other  
10 evidence of releases were identified during the records review and structural assessment. The  
11 Permittees shall collect a soil sample beneath all intersections of piping associated with the unit  
12 undergoing closure. The Permittees shall collect one soil sample every 30 feet beneath the axis of  
13 the lowest portions of any open conveyance drainage system in any permitted unit that has sloped  
14 flooring (40 CFR § 270.32(b)).

15 The Permittees shall remove all asphalt, asphaltic concrete, concrete, and underlying subgrade  
16 materials if hazardous constituents are detected in underlying soils or tuff (40 CFR § 270.32(b)).

17 The Permittees may sample for radionuclides for use as indicators of contaminant releases at units  
18 where radionuclides were stored. The Permittees shall not use these samples to demonstrate the  
19 absence of contaminants for validation of clean closure at permitted units (40 CFR § 270.32(b)).

#### 20 **9.2.5.7 Investigative Sampling to Determine the Extent of a Release**

21 The Permittees shall conduct all investigative sampling in accordance with Permit Section  
22 9.2.4.7.

#### 23 **9.2.5.8 Confirmatory Sampling to Confirm Clean-Up**

24 The Permittees shall conduct all confirmatory sampling in accordance with Permit Section  
25 9.2.4.8.

### 26 **9.3 CLOSURE PERFORMANCE STANDARDS**

27 At the cessation of hazardous waste management operations at a permitted unit, or portion of a  
28 permitted unit, the Permittees shall clean close the unit, or portion of a unit, by performing the  
29 following:

- 30 1. removing all waste and waste residues;
- 31 2. minimizing the need for further maintenance;
- 32 3. controlling, minimizing, or eliminating, to the extent necessary to protect human health  
33 and the environment, the post-closure escape of hazardous waste, hazardous constituents,

1 leachate, contaminated runoff, or hazardous waste decomposition products to the ground,  
2 surface waters, or atmosphere;

3 4. complying with all applicable closure requirements of 40 CFR Part 264, Subparts F, G, I,  
4 J, K, N, and X ;and

5 5. complying with all applicable post-closure requirements of 40 CFR Part 264, Subparts F,  
6 G, J, K, N, and X.

7 (40 CFR § 264.111)

8 Clean closure for permitted units will be achieved when all structures, equipment, and media  
9 associated with the permitted unit have been decontaminated or removed in accordance with this  
10 Permit Part.

11 If the Permittees can not achieve clean closure standards as defined above for 40 CFR Part 264,  
12 Subparts K, N, and X units, the Permittees shall submit a Post-Closure Care Plan according to 40  
13 CFR § 264.117, which is incorporated herein by reference. The Post-Closure Care Plan shall be  
14 submitted to the Department as part of a permit modification request.

15 Clean closure for 40 CFR Part 264, Subparts I and J units is attained when sampling and analysis  
16 results of equipment and structures associated with the permitted unit demonstrate that hazardous  
17 waste, hazardous waste residues, and hazardous waste constituents are not present on equipment  
18 and structures and that contaminated media does not contain concentrations of hazardous  
19 constituents greater than the clean-up levels specified in Permit Part 11 (*Corrective Action*).

## 20 **9.4 CLOSURE REPORT**

21 At the completion of closure of any permitted unit, the Permittees shall submit a closure report  
22 for Department approval that summarizes all activities conducted during closure including, but  
23 not limited to, the following:

24 1. the results of all investigation;

25 2. remediation waste management;

26 3. decontamination;

27 4. verification/confirmation sampling activities; and

28 5. results of all chemical analyses and other characterization activities.

29 Such closure reports shall be submitted to the Department no later than 90 days after completion  
30 of unit closure. The Department may require interim reports that document the progress of  
31 closure.

1 **9.5 CERTIFICATION OF CLOSURE TO THE DEPARTMENT**

2 Within 60 days after the date of completion of closure of a permitted unit, or a portion of a  
3 permitted unit, and within 60 days of completion of final closure of the Facility, the Permittees  
4 shall submit to the Department, by registered mail, a certification that the permitted unit or the  
5 Facility has been closed in compliance with the specifications in this Permit Part and the  
6 approved Closure Plans. The certification must be signed by the Permittees and by an  
7 independent professional engineer registered in the State of New Mexico (40 CFR § 264.115).

8 If the Permittees leave waste in place, they shall submit to the Department a survey plat as  
9 required by 40 CFR § 264.116 in conjunction with the certification of closure. Documentation  
10 supporting the independent registered professional engineer's certification must be furnished to  
11 the Department upon request until the Permittees are released from the financial assurance  
12 requirements for closure under 40 CFR § 264.143.

13 **9.6 DISPOSAL UNITS AND UNITS TO BE CLOSED AS LANDFILLS**

14 The disposal or landfill units, Material Disposal Areas (MDAs) G, H, and L, are no longer  
15 accepting hazardous waste and must undergo closure. The first phases of closure will be  
16 conducted through the corrective measures evaluation and implementation process outlined in  
17 Section VII of the March 1, 2005 Compliance Order on Consent (Order). The Permittees are  
18 required, in accordance with the Order, to submit to the Department for approval a Corrective  
19 Measures Evaluation Report (CME) for MDAs G, H (submitted), and L on September 12, 2008  
20 and January, 18, 2008, respectively. The Department will select remedies and issue a statement  
21 of basis for the selected remedies for each closed disposal or landfill unit in accordance with  
22 Section VII of the Order. The remedy selection is subject to public comment in accordance with  
23 20.4.1.901 NMAC and as described in Section VII.D.7 of the Order. The selected remedies that  
24 will achieve closure of MDAs G, H, and L shall be protective of human health and the  
25 environment and attain the appropriate clean-up levels as specified in Permit Part 11 (*Corrective*  
26 *Action*).

27 Upon the Department's selection of the remedies for closure of each of the disposal or landfill  
28 units, the Permittees shall be required to submit a Corrective Measures Implementation (CMI)  
29 Work Plan to the Department for approval on a schedule established by the Department. The  
30 CMI Work Plan for each disposal or landfill unit shall satisfy the requirements for Closure Plans  
31 specified in 40 CFR § 264.112, which is incorporated herein by reference. All inspection,  
32 monitoring, and operation and maintenance (O & M) of remediation systems installed as part of  
33 CMI Work Plan (Closure Plan) implementation shall be proposed in the Post-Closure Care Plans  
34 for MDAs G, H, and L as described in Permit Part 10 (*Post-Closure Care*).

35 Upon approval of the Closure Plan, the Department will establish a due date for the Permittees'  
36 submission of a Closure Report addressing the results of the execution of the Closure Plan.

37 The selected remedies that will achieve closure of MDAs G, H, and L shall meet the human  
38 health and ecological risk cleanup levels referenced in Permit Sections 11.4 and 11.5.

1 **PART 10: POST-CLOSURE CARE**

2 **10.1 POST-CLOSURE CARE**

3 If, upon closure of a permitted unit, the Permittees cannot achieve the closure performance  
4 standards described in Permit Part 9 (*Closure*), the Permittees shall conduct post-closure care for  
5 that unit in accordance with the requirements of this Permit Part, pursuant to 40 CFR §  
6 270.1(c)(6)(iii). All post-closure care activities shall be conducted in accordance with the  
7 provisions in 40 CFR §§ 264.117 through 264.120, which are incorporated herein by reference.

8 Post-closure care for each hazardous waste management unit shall continue for 30 years after the  
9 date of closure of that unit unless the Department:

- 10 1. shortens the post-closure care period if it is found that the reduced period is sufficient to  
11 protect human health and the environment; or
- 12 2. extends the post-closure care period if it is found that an extended period is necessary to  
13 protect human health and the environment.

14 (40 CFR §§ 264.117(2)(i) and (ii))

15 The Permittees shall submit an application for a Post-Closure Care Permit no later than 90  
16 calendar days from the date that the Permittees determine that the permitted unit will be closed  
17 with waste in place, in accordance with 40 CFR §§ 264.117 through 120.

18  
19 **10.1.1 Post-Closure Care Plan**

20 The Permittees shall submit to the Department for approval a Post-Closure Care Plan in  
21 accordance with 40 CFR § 264.118, which is incorporated herein by reference. The Post-  
22 Closure Care Plan must identify all activities, including inspection and monitoring activities that  
23 will be carried on after closure, as well as the frequency of these activities. Post-closure  
24 activities to be addressed include, but are not limited to:

- 25 1. the actions necessary for controlling, minimizing, or eliminating, to the extent necessary  
26 to protect human health and the environment, the post-closure escape of hazardous waste,  
27 hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition  
28 products to the ground, surface waters, or atmosphere;
- 29 2. descriptions of the monitoring and reporting that will be performed in accordance with  
30 the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X;
- 31 3. descriptions of the procedures for maintaining and monitoring the waste containment  
32 systems in accordance with the requirements of 40 CFR Part 264, Subparts F, K, L, M, N,  
33 and X to ensure:

- 1       4. the integrity of the cap and final cover or other containment systems in accordance with  
2       the requirements of 40 CFR Part 264, Subparts F, K, L, M, N, and X;
- 3       5. the function of the monitoring systems in accordance with the requirements of 40 CFR  
4       Part 264, Subparts F, K, L, M, N, and X; and
- 5       6. the name, address and contact information of the person(s) or office to contact regarding  
6       the unit during the post-closure care period.

#### 7       **10.1.2     Amendment of the Post-Closure Care Plan**

8       The Permittees shall modify the Post-Closure Care Plan as required by 40 CFR § 264.118(d)(2),  
9       which is incorporated by reference. The Permittees shall attain prior approval from the  
10       Department by means of a permit modification request whenever: 1) a change to the approved  
11       Post-Closure Care Plan is planned; 2) there is a change in the expected year of final closure; or 3)  
12       other events occur during the active life or post-closure period of the facility that affect the  
13       approved Post-Closure Care Plan.

### 14       **10.2     NOTICES AND CERTIFICATIONS**

#### 15       **10.2.1     Notification Requirements**

16       The Permittees shall maintain in the Facility Operating Record copies of all documentation  
17       submitted to the local zoning authority or the authority with jurisdiction over local land use. The  
18       Permittees shall submit to the Department a record of the type, location, and quantity of  
19       hazardous wastes and hazardous constituents remaining within each cell or permitted unit. For  
20       hazardous wastes disposed of before January 12, 1981, the Permittees shall identify the type,  
21       location, and quantity of the hazardous wastes in accordance with all records retained (40 CFR §  
22       264.119(a)).

#### 23       **10.2.2     Record Requirements**

24       The Permittees shall maintain documentation of certification of closure of all hazardous waste  
25       disposal units in accordance with 40 CFR § 264.119(b), which is incorporated herein by  
26       reference.

27       The Permittees shall record a notation on the deed to the Facility property, or on some other  
28       instrument that is normally examined during the title search, that will in perpetuity notify any  
29       potential purchaser of the property of the following:

- 30       1. the land has been used to manage hazardous wastes;
- 31       2. its use is restricted under 40 CFR Part 264, Subpart G; and
- 32       3. the survey plat and record of the type, location, and quantity of hazardous wastes  
33       disposed of within each cell or other hazardous waste disposal unit of the Facility have  
34       been filed with the Department (40 CFR § 264.119(b)(1)).

1 **10.2.3 Completion of Post-Closure Requirements**

2 No later than 60 days after completion of the established post-closure care period for each  
3 permitted unit required to conduct post-closure care, the Permittees shall submit to the  
4 Department, by registered mail, a certification that the post-closure care for the hazardous waste  
5 disposal unit was performed in accordance with the specifications in the approved Post-Closure  
6 Care Plan. The certification must be signed by the Permittees and an independent, New Mexico  
7 registered professional engineer. Documentation supporting the independent, registered  
8 professional engineer's certification must be furnished to the Department in conjunction with the  
9 certification (40 CFR § 264.120).

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1 **PART 11: CORRECTIVE ACTION**

2 This Permit Part addresses corrective action at the Facility where releases of hazardous waste or  
3 hazardous constituents to the environment have occurred. Corrective action is divided into two  
4 categories, 1) corrective action for permitted units, and 2) corrective action for units covered  
5 under the March 1, 2005 Compliance Order on Consent (Order).

6 **11.1 CORRECTIVE ACTION REQUIREMENTS UNDER THE CONSENT ORDER**

7 The Department and the Permittees have agreed to a Compliance Order on Consent (Consent  
8 Order) dated March 1, 2005, which requires the Permittees to conduct corrective action at all  
9 solid waste management units (SWMUs) and Areas of Concern (AOCs), at the Facility to fulfill  
10 the requirements of 40 CFR § 264.101. The Consent Order is an enforceable document pursuant  
11 to 40 CFR §§ 264.90(f) and 270.1(c)(7).

12 **11.2 CORRECTIVE ACTION REQUIREMENTS UNDER THE PERMIT**

13 Section III.W.1 of the Consent Order expressly identifies four circumstances in which corrective  
14 action is to be conducted under this Permit (or other enforceable document) rather than the  
15 Consent Order:

- 16 1. new releases and newly discovered releases of hazardous waste or hazardous constituents  
17 from permitted units at the Facility;
- 18 2. the closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they  
19 apply to permitted units at the Facility;
- 20 3. implementation of the controls, including long-term monitoring, for any SWMUs or  
21 AOCs on Permit Attachment P (*Listing of SWMUs and AOCs*), Table P-2 (*Corrective*  
22 *Action Complete with Controls*); and
- 23 4. any corrective action to address releases of hazardous waste or hazardous constituents  
24 that occur or are discovered after the date on which the Consent Order terminates.

25 In circumstances where Corrective Action is required under the Permit, the Permittees shall  
26 conduct corrective action pursuant to this Permit in accordance with sections 74-4-4(A)(5)(h)  
27 and (i) and 74-4-4.2(B) of the HWA. The Permittees shall coordinate all corrective action  
28 conducted under this Permit with corrective action conducted under the Consent Order.  
29 Corrective action for releases from operating units that co-mingle with releases originating from  
30 other sources shall be conducted under the Consent Order. Any SWMU or AOC for which  
31 corrective action is required that is not subject to corrective action under the Consent Order shall  
32 be subject to corrective action under this Permit Part and 40 CFR §§ 264.100 and 264.101, which  
33 are incorporated herein by reference.

1 **11.2.1 Identification of SWMUs and AOCs Requiring Corrective Action**

2 Attachment P, Table P-1 (*SWMUs and AOCs Requiring Corrective Action*) includes a list of  
3 SWMUs and AOCs at the Facility for which corrective action is required under the Consent  
4 Order. If any additional SWMUs or AOCs are discovered while the Consent Order is in effect,  
5 corrective action for such units shall be conducted under the Consent Order. Table P-1 will be  
6 modified to include any newly identified SWMUs and AOCs for tracking purposes.

7 Attachment P, Table P-2 includes a list of SWMUs and AOCs at the Facility for which  
8 corrective action is complete with controls.

9 Attachment P, Table P-3 (*Corrective Action Complete without Controls*) includes a list of  
10 SWMUs at the Facility for which corrective action is complete without controls and do not  
11 require monitoring.

12 Attachment P, Table P-1 (*Permitted Units Actively Managing Hazardous Waste*) includes lists of  
13 hazardous waste management units at the Facility and their status (*e.g.*, interim status, permitted  
14 operating, closed) of each unit.

15 **11.3 GENERAL CONDITIONS**

16 **11.3.1 Groundwater Monitoring**

17 The Permittees shall conduct groundwater monitoring for all hazardous waste management units  
18 at the Facility subject to the groundwater monitoring requirements of 40 CFR §§ 264.98 and  
19 264.99 and subject to corrective action under this Permit.

20 **11.3.1.1 Detection Monitoring**

21 The Permittees shall conduct detection monitoring in accordance with the requirements of 40  
22 CFR § 264.98, which is incorporated herein by reference, to ensure the earliest possible detection  
23 of contaminants in groundwater. The Permittees shall coordinate such monitoring with the  
24 monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any  
25 Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the  
26 Order.

27 The Permittees shall notify the Department, in writing, of any new detections of hazardous waste  
28 and hazardous constituents in groundwater at any location within seven days of detection. Such  
29 detections of hazardous waste or hazardous constituents shall also be highlighted in the periodic  
30 groundwater monitoring report submitted to the Department, in accordance with Permit Section  
31 11.7, summarizing the groundwater monitoring results for the appropriate monitoring period.

32 **11.3.1.2 Compliance Monitoring**

33 The Permittees shall conduct compliance monitoring in accordance with the requirements of 40  
34 CFR § 264.99, which is incorporated herein by reference, to monitor the progress of cleanup of  
35 contaminants in groundwater. The Permittees shall coordinate such monitoring with the

1 monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any  
2 Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the  
3 Order.

#### 4 **11.3.2 Groundwater Monitoring Reporting**

5 The Permittees shall submit to the Department periodic monitoring reports the Department in  
6 accordance with the schedule in the Interim Facility Wide Groundwater Monitoring Plan or the  
7 Department-approved watershed-specific Long-term Groundwater Monitoring Plans. The  
8 reports shall be prepared in accordance with Permit Section 11.12. The Permittees shall submit  
9 to the Department periodic groundwater monitoring reports for all groundwater monitoring data  
10 generated pursuant to this Permit. The Permittees shall propose a schedule for such reporting to  
11 the Department for approval. Such reporting shall be coordinated with, and may be combined  
12 with, the reporting conducted under section IV.A.6 of the Consent Order.

#### 13 **11.3.3 Corrective Action Beyond the Facility Boundary**

14 The Permittees shall notify the Department, orally and in writing in accordance with Permit  
15 Section 1.9.11, upon discovering that a release of hazardous waste or hazardous constituents has  
16 migrated beyond the Facility boundary or has the potential to migrate beyond the Facility  
17 boundary.

18 In the event that hazardous waste or hazardous constituents migrate beyond the Facility  
19 boundary, the Permittees shall implement corrective action beyond the Facility boundary as  
20 necessary to protect human health and the environment, unless the Permittees demonstrate to the  
21 Department that, despite the Permittees' best efforts, the Permittees are unable to obtain the  
22 necessary permission to undertake such actions. The Permittees are not relieved of any  
23 responsibility to clean up a release that has migrated beyond the Facility boundary where off-site  
24 access has been denied. On-site measures to address such releases shall be taken, to be  
25 determined on a case-by-case basis (40 CFR § 264.101(c)).

#### 26 **11.3.4 Off-Site Access**

27 To the extent that any corrective action requirement of this Permit requires access to property not  
28 owned or controlled by the Permittees, the Permittees shall use their best efforts to obtain access  
29 from the present owners of such property to conduct the required activities and to allow the  
30 Department access to such property to oversee such activities. In the event that the Permittees do  
31 not obtain such access, the Permittees shall notify the Department in writing regarding its best  
32 efforts and its failure to obtain such access.

#### 33 **11.3.5 Newly Discovered Releases**

34 The Permittees shall notify the Department, orally and in writing in accordance with Permit  
35 Section 1.9.11, upon discovery of any previously unknown release of hazardous waste or  
36 hazardous constituents into soil, sediment, surface water, or groundwater. The Department may  
37 determine that further investigation of the release is needed. The Department may also

1 determine that corrective action is needed to address the release. If the Department makes such a  
2 determination, it will notify the Permittees in writing.

### 3 **11.3.6 Field Activities**

4 The Permittees shall notify the Department in writing of any field sampling or other field  
5 activities undertaken pursuant to any corrective action requirement of this Permit, and shall allow  
6 the Department to collect split samples upon request of the Department. For such sampling or  
7 other field activities, the Permittees shall notify the Department no less than 15 days prior to the  
8 commencement of such sampling.

### 9 **11.3.7 Health and Plan**

10 The Permittees shall prepare Health and Safety Plans for all field activities. The Health and  
11 Safety Plans shall be prepared in accordance with all applicable provisions of this Permit and all  
12 local, State and federal regulations and be developed as stand-alone documents.

### 13 **11.3.8 Recordkeeping**

14 The Permittees shall maintain all monitoring data, including sampling procedures, records of  
15 field measurements, laboratory analytical data, quality assurance/quality control documents,  
16 chain-of-custody records, well completion reports and periodic monitoring reports in the Facility  
17 Operating Record for a minimum of three years after the end of the operating life of the Facility  
18 and a minimum of three years after the end of any post-closure care periods.

## 19 **11.4 CLEANUP LEVELS**

20 The Department and the New Mexico Water Quality Control Commission (WQCC) have  
21 separately specified certain cleanup goals and methods of calculating cleanup levels. The  
22 Department has also specified certain reporting requirements for sites where corrective action is  
23 required in response to releases to the environment. In general, the Department has selected a  
24 human health target risk level of  $10^{-5}$  for carcinogenic substances and a Hazard Index (HI) of 1.0  
25 for non-carcinogenic substances as cleanup goals for establishing site-specific cleanup levels for  
26 one or more contaminants for which toxicological data are published. The Permittees shall  
27 follow the cleanup and screening levels described in this Permit Part in implementing the  
28 corrective action requirements of this Permit. In addition, cleanup levels for the protection of the  
29 environment shall address ecological risk consistent with the Department's risk assessment  
30 guidance. Cleanup levels for structures and equipment, decontaminated during closure of  
31 permitted units, shall be to concentration levels less than the detection limits established in EPA  
32 SW-846 for each analytical method used.

### 33 **11.4.1 Groundwater**

34 Groundwater cleanup levels shall be based on existing standards (e.g., drinking water standards)  
35 when they are available. Any cleanup level based on a risk assessment must be approved by the  
36 Department.

1 **11.4.1.1 Groundwater Cleanup Levels**

2 The cleanup levels for all contaminants in groundwater shall be the WQCC groundwater quality  
3 standards, 20.6.2.3103 NMAC, the toxic pollutant clean-up levels referenced in 20.6.2.7.WW,  
4 and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the federal  
5 Safe Drinking Water Act (42 U.S.C. §§ 300f to 300j-26) or the New Mexico Environmental  
6 Improvement Board (EIB), 20.7.10 NMAC. If both a WQCC water quality standard and an  
7 MCL have been established for an individual substance, then the lower of the levels shall be the  
8 cleanup level for that substance.

9 The most recent version of the EPA Region VI Human Health Medium-Specific Screening Level  
10 (HHMSSL) for tap water shall be used to establish the cleanup level if either a WQCC standard  
11 or an MCL has not been established for a specific substance. If no WQCC groundwater standard  
12 or MCL has been established for a contaminant for which toxicological information is published,  
13 the Permittees shall use a target excess cancer risk level of  $10^{-5}$  for carcinogenic substances and a  
14 HI of 1.0 for non-carcinogenic substances as the basis for proposing a cleanup level for the  
15 contaminant. If the naturally occurring (background) concentration of a contaminant exceeds the  
16 standard then the cleanup goal defaults to the background concentration for that specific  
17 substance.

18 **11.4.1.2 Groundwater Cleanup Level for Perchlorate**

19 If, during the term of this Permit, the WQCC adopts a groundwater quality standard for  
20 perchlorate, or EPA or the EIB adopts an MCL for perchlorate, such standard or MCL shall be  
21 the cleanup level in accordance with Section 11.2.1.1 above. If perchlorate is detected, the  
22 Permittees shall evaluate the nature and extent of the perchlorate contamination. In the absence  
23 of a groundwater quality standard or MCL, if perchlorate is detected at concentrations at or  
24 greater than 4 µg/L, then the cleanup level shall be established using a HI of 1.0 in accordance  
25 with Permit Section 11.4.1.1 above.

26 **11.4.2 Soil and Sediment**

27 The cleanup levels for soil and sediments shall be the cleanup levels for soil set forth in this  
28 Permit Section (11.4.2). Any cleanup level based on a risk assessment must be approved by the  
29 Department.

30 **11.4.2.1 Soil Cleanup Levels**

31 The Department has specified soil-screening levels that are based on a target total excess cancer  
32 risk of  $10^{-5}$  for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0  
33 for residential and industrial land use. The Department may determine that a dilution attenuation  
34 factor of one, as calculated using the Department-approved methods, for contaminated soils is  
35 appropriate to achieve clean closure, where soil to groundwater migration is a concern. Soil  
36 cleanup levels shall be the target soil screening levels listed in the Department's *Technical*  
37 *Background Document for Development of Soil Screening Levels* (as updated). If a Department  
38 soil screening level has not been established for a substance for which toxicological information  
39 is published, the soil cleanup level shall be established using the most recent version of the EPA

1 Region VI HHMSSL for residential and industrial soil for compounds designated as “n” (non-  
2 carcinogen effects), “max” (maximum concentration), and “sat” (soil saturation concentration),  
3 or ten times the EPA Region VI HHMSSL for compounds designated “c” (carcinogen effects).  
4 The cumulative risk shall not exceed a total excess cancer risk of  $10^{-5}$  for carcinogenic  
5 substances and, for non-carcinogenic substances, a target HI of 1.0 at sites where multiple  
6 contaminants are present.

7 If the current and reasonably foreseeable future land use is one for which the Department has not  
8 established soil screening levels, the Permittees may propose cleanup levels to the Department  
9 based on a risk assessment and a target excess cancer risk level of  $10^{-5}$  for carcinogenic  
10 substances or an HI of 1.0, based on current and reasonably foreseeable future land use (e.g.,  
11 residential, recreational, industrial).

#### 12 **11.4.2.2 Soil Polychlorinated Biphenyls Cleanup Levels**

13 The soil cleanup level for PCBs is either a concentration of 1 milligram per kilogram (mg/kg) or  
14 a risk-based PCB concentration level established through performing a health risk assessment  
15 using a target excess cancer risk level of  $10^{-5}$  for carcinogenic substances or an HI of 1.0.  
16 (NMED *Risk-based Remediation of Polychlorinated Biphenyls at RCRA Corrective Action Sites*  
17 (March 2000)).

#### 18 **11.4.3 Surface Water**

19 The Permittees shall comply with the surface water quality standards outlined in the Clean Water  
20 Act (33 U.S.C. §§ 1251 to 1387), the New Mexico WQCC Regulations (20.6.2 NMAC), and the  
21 State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

### 22 **11.5 ECOLOGICAL RISK EVALUATION**

23 Screening for ecological risk shall be conducted using the LANL Ecological Screening Levels  
24 (ESLs), which are included in LANL’s “*Screening Level Ecological Risk Assessment Methods*”,  
25 (LA-UR-99-1405 and as updated and approved by the Department). In the absence of ESLs, the  
26 Permittees may use U.S. EPA’s ECO-SSLs with the Department approval. If the LANL’s ESL  
27 database does not contain a screening value for the receptor or contaminant, the Permittees shall  
28 derive a screening level using the methodology in the Department’s “*Guidance for Assessing*  
29 *Ecological Risks Posed by Chemicals: Screening –Level Ecological Risk Assessment*” or in  
30 LANL’s “*Screening Level Ecological Risk Assessment Methods*”, (LA-UR-99-1405).  
31 Ecological risk at each site shall be evaluated in a manner consistent with the Department’s  
32 *Guidance for Assessing Ecological Risks Posed by Chemicals: Screening- Level Ecological Risk*  
33 *Assessment* (March, 2000 as updated).

### 34 **11.6 VARIANCE FROM CLEAN-UP LEVELS**

35 The Permittees may seek a variance from a particular cleanup level in accordance with this  
36 Permit Section (11.6).

1 **11.6.1 Water Quality Standards**

2 For a cleanup level based on a water quality standard set by the WQCC, the Permittees may seek  
3 approval of an alternative abatement standard in accordance with the process specified in the  
4 WQCC Regulations, 20.6.2.4103.E and F NMAC.

5 **11.6.2 Other Cleanup Levels**

6 For all other cleanup levels, the Permittees may seek approval of a variance from a cleanup level  
7 by submitting to the Department a written request for a determination that attainment of the  
8 cleanup level is impracticable. The request must include a demonstration that attaining the  
9 cleanup level is technically or physically impossible or otherwise impractical using potential  
10 corrective action remedies. The request shall include, at a minimum, the following:

- 11 1. a discussion of the effectiveness of potential corrective action remedies;
- 12 2. a discussion of whether the proposed variance would result in a present or future hazard  
13 to public health or the environment;
- 14 3. proposed alternate cleanup levels that are practical, based on potential corrective action  
15 remedies and a site-specific risk assessment;
- 16 4. all supporting documentation and analyses; and
- 17 5. any other information requested by the Department.

18 If the Department approves the Permittee's impracticability demonstration, it will notify the  
19 Permittees in writing, and such notice will describe the specific action to be taken by the  
20 Permittees.

21 **11.7 PERMIT MODIFICATION FOR CORRECTIVE ACTION COMPLETE**

22 The Permittees may submit to the Secretary a request for a Class 3 permit modification to change  
23 the status of the unit from "corrective action required" to "corrective action complete." The permit  
24 modification will move the SWMU from Permit Attachment P (*Listing of SMWUs and AOCs*),  
25 Table P-1 (*SWMUs and AOCs Requiring Corrective Action*) to either Attachment P, Table P-2  
26 (*Corrective Action Complete with Controls*) or Attachment P, Table P-3 (*Corrective Action  
27 Complete without Controls*) pursuant to the terms of this Permit. The Department's determination  
28 that corrective action is complete for a SWMU or AOC placed on either the *Corrective Action  
29 Complete with Controls* list or the *Corrective Action Complete without Controls* list will be subject  
30 to the Secretary's reservation of rights for new information or unknown conditions. In the event  
31 the Secretary seeks to require additional work at any SWMU or AOC contained on either of the  
32 two lists, the Secretary will initiate a permit modification to remove the SWMU or AOC from the  
33 corrective action complete lists.

1 **11.8 CORRECTIVE ACTION PROCEDURES**

2 The Permittees shall conduct corrective action at sites where releases of hazardous waste or  
3 hazardous constituents have occurred. If corrective action is necessary to protect human health or  
4 the environment, the Department will direct the Permittees to complete one or more of the  
5 requirements included in this Permit Section. The conditions listed below apply to all corrective  
6 action conducted under this Permit unless otherwise specified in Permit Parts 6, 9, 10 or 12.

7 **11.8.1 Release Assessment**

8 **11.8.1.1 Release Assessment Report**

9 If required by the Department, the Permittees shall submit a Release Assessment Report for  
10 newly discovered releases from any Permitted unit. Any revisions to the Release Assessment  
11 Report required by the Department shall be submitted within 30 calendar days of receipt of the  
12 Department's comments on the Release Assessment Report.

13 The Release Assessment Report shall, at a minimum, include the following information:

- 14 1. location of unit(s) on a topographic map of appropriate scale, as required under 40 CFR §  
15 270.14(b)(19);
- 16 2. designation of type and function of unit(s);
- 17 3. general dimensions, capacities and structural description of unit(s) (supply any available  
18 plans/drawings);
- 19 4. dates that the unit(s) was operated;
- 20 5. all available site history information;
- 21 6. specifications of all wastes that have been managed at/in the unit(s) to the extent  
22 available. Include any available data on hazardous waste or hazardous constituents in the  
23 wastes; and
- 24 7. all available information pertaining to any release of hazardous waste or hazardous  
25 constituents from such unit(s) (to include ground water data, soil analyses, air, and  
26 surface water data).

27 **11.8.1.2 Requirement to Proceed**

28 The Department will review the Release Assessment Report to determine whether any further  
29 investigative action is required. The Department will notify the Permittees of the need for  
30 confirmatory sampling, if necessary, or notify the Permittees that an Investigation Work Plan is  
31 required in accordance with the requirements in Permit Section 11.8.5.1. The Department will  
32 notify the Permittees of any corrective action complete decision.

1 **11.8.2 Interim Measures**

2 **11.8.2.1 Department-Initiated Interim Measures**

3 Upon written notification by the Department, the Permittees shall prepare and submit an Interim  
4 Measures (IM) Work Plan at any permitted or interim status unit where the Department  
5 determines that interim measures are necessary to minimize or prevent the migration of  
6 hazardous waste or hazardous constituents and limit actual or potential human and environmental  
7 exposure to hazardous waste or hazardous constituents while long term corrective action  
8 remedies are evaluated and implemented. The Permittees shall submit its IM Work Plan to the  
9 Department within 30 calendar days of the Department's notification, unless another time period  
10 is specified by the Department. Such interim measures may be conducted concurrently with any  
11 required corrective action. The Permittees shall prepare and submit IM Work Plans in  
12 accordance with the work plan format included in Permit Section 11.12 (*Reporting*  
13 *Requirements*).

14 **11.8.2.2 Permittees-Initiated Interim Measures**

15 The Permittees may initiate interim measures at a unit by notifying the Department, in writing, at  
16 least 30 calendar days prior to beginning the Interim Measures. The Department will approve  
17 the Permittees-initiated IM, conditionally approve the IM, or require submittal of an IM Work  
18 Plan for the Department approval prior to implementation of the IM.

19 **11.8.3 Emergency Interim Measures**

20 The Permittees may determine, during implementation of site investigation activities, that  
21 emergency interim measures are necessary to address an immediate threat of harm to human  
22 health or the environment. The Permittees shall notify the Department within one business day  
23 of discovery of the facts giving rise to the threat, and shall propose emergency interim measures  
24 to address the threat. If the Department approves the emergency interim measures in writing, the  
25 Permittees may implement the proposed emergency interim measures without submitting an IM  
26 Work Plan. If circumstances arise resulting in an immediate threat to human health or the  
27 environment such that initiation of emergency interim measures are necessary prior to obtaining  
28 written approval from the Department, the Permittees shall notify the Department within one  
29 business day of taking the emergency interim measure. The notification shall contain a  
30 description of the emergency situation, the types and quantities of contaminants involved, the  
31 emergency interim measures taken, and contact information for the emergency coordinator  
32 handling the situation. The notification shall also include a written statement justifying the need  
33 to take the emergency action without prior written approval from the Department. This  
34 requirement shall not be construed to conflict with 40 CFR §§ 264.1(g)(8) or 270.61.

35 **11.8.4 IM Work Plan Requirements**

36 The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or  
37 potential threat(s) to human health or the environment and is consistent with, and integrated into,  
38 any final corrective measures at the Facility. The IM Work Plan shall include the interim

1 measures objectives, procedures for implementation (including any designs, plans, or  
2 specifications), and schedules for implementation.

3 **11.8.4.1 Interim Measures Implementation**

4 **11.8.4.1.i Implementation and Completion of Approved IM Work Plan**

5 The Permittees shall implement interim measures required under Permit Section 11.8.2 in  
6 accordance with the Department-approved IM Work Plan. The Permittees shall complete  
7 interim measures within 180 calendar days of the start of implementation of the interim measure.  
8 The Permittees may submit a written request to the Department to extend the period for  
9 implementation of the interim measure. The request must provide justification for the extension  
10 and a proposed schedule for completion of the interim measure. The Department will notify the  
11 Permittees, in writing, of the approval or disapproval of the request within 30 calendar days of  
12 receipt of the IM implementation extension request.

13 **11.8.4.1.ii Notification of Changes**

14 The Permittees shall give notice to the Department as soon as possible of any planned changes,  
15 reductions or additions to the IM Work Plan required by the Department under Permit Section  
16 11.8.2.1 or initiated by the Permittees in accordance with Permit Section 11.8.2.2.

17 **11.8.4.1.iii Interim Measures Reports**

18 The Permittees shall submit to the Department for review and approval, within 90 calendar days  
19 of completion of interim measures, an IM Report summarizing the results of interim measure  
20 implementation. The IM Report shall contain, at a minimum, the following information:

- 21 1. a description of interim measures implemented;
- 22 2. summaries of results;
- 23 3. summaries of all problems encountered during IM investigations;
- 24 4. summaries of accomplishments and/or effectiveness of interim measures; and,
- 25 5. copies of all relevant laboratory/monitoring data, maps, logs, and other related  
26 information.

27 **11.8.5 Corrective Action Investigations**

28 **11.8.5.1 Investigation Work Plan**

29 **11.8.5.1.i Investigation Work Plan Submittal**

30 The Permittees shall submit to the Department Investigation Work Plans for permitted or interim  
31 status units where the Department determines that corrective action is necessary to investigate  
32 releases to the environment.

1 **11.8.5.1.ii Investigation Work Plan Requirements**

2 Investigation Work Plans shall meet the requirements specified in Permit Section 11.12  
3 (*Reporting Requirements*). Investigation Work Plans shall include schedules of implementation  
4 and completion of specific actions necessary to determine the nature and extent of contamination  
5 and the potential pathways of contaminant releases to the air, soil, surface water, and ground  
6 water. The Permittees shall provide sufficient justification and associated documentation that a  
7 release is not probable or has already been characterized if a unit or a media/pathway associated  
8 with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in an  
9 Investigation Work Plan. Such deletions of a unit, medium, or pathway from the work plan(s)  
10 are subject to the approval of the Department. The Permittees shall provide sufficient written  
11 justification for any omissions or deviations from the minimum requirements specified in Permit  
12 Section 11.12 (*Reporting Requirements*). Such omissions or deviations are subject to the  
13 approval of the Department. In addition, Investigation Work Plans shall include all  
14 investigations necessary to ensure compliance with 40 CFR § 264.101.

15 **11.8.5.1.iii Historical Documents**

16 The Permittees shall submit to the Department a summary of the historical information and  
17 assessment of potential contaminant releases relating to each unit in conjunction with the unit-  
18 specific Investigation Work Plan including complete, legible copies of all associated  
19 photographic imprints, maps, figures, drawings, tables, attachments, enclosures, appendices and  
20 other relevant supporting documentation. Such summaries shall be submitted as separate  
21 documents and not as part of the site-specific Investigation Work Plans.

22 **11.8.5.1.iv Investigation Work Plan Implementation**

23 The Permittees shall implement Investigation Work Plans as approved by the Department. The  
24 Permittees shall notify the Department at least 15 calendar days prior to any permit or corrective  
25 action-related field activity (e.g., drilling, sampling).

26 **11.8.5.2 Corrective Action Investigation Reports**

27 The Permittees shall prepare and submit to the Department Investigation Reports for the  
28 investigations conducted in accordance with Investigation Work Plans submitted under Permit  
29 Section 11.8.5.1. The Permittees shall submit the Investigation Reports to the Department for  
30 review and approval in accordance with the schedules included in its approved Investigation  
31 Work Plans.

32 The Investigation Reports shall include an analysis and summary of all required investigations  
33 conducted under this Permit. The summary shall describe the type and extent of contamination  
34 at each unit investigated, including sources and migration pathways identify all hazardous waste  
35 or constituents present in all media, and describe actual or potential receptors. The Investigation  
36 Report shall also describe the extent of contamination (qualitative and quantitative) in relation to  
37 background levels for the area. If the Investigation Report concludes that further work is  
38 necessary, the report shall include a schedule for submission of a work plan for the next phase of  
39 investigation.

1 **11.8.5.2.i Cleanup Levels**

2 The Investigation Reports shall identify the applicable cleanup levels in accordance with Permit  
3 Sections 11.4 through 11.6 for each hazardous waste or hazardous constituent found at each unit  
4 where corrective action is required. The Permittees shall propose in the Investigation Report or  
5 in a subsequent Risk Assessment or Corrective Measures Evaluation appropriate cleanup levels  
6 for those hazardous wastes or hazardous constituents without established cleanup levels based  
7 upon human and ecological risk.

8 **11.8.5.2.ii Requirement to Proceed**

9 Based upon the Department's review of the Investigation Report, the Department will notify the  
10 Permittees of the need for further investigative action, if necessary, and inform the Permittees, if  
11 not already notified, of the need for a Corrective Measures Evaluation. The Department will  
12 notify the Permittees if corrective action is complete. If the Department determines that further  
13 investigation is necessary, the Department will require the Permittees to submit a work plan for  
14 approval that includes a proposed schedule for additional investigation(s).

15 **11.8.5.3 Risk Assessment**

16 The Permittees shall attain the cleanup goals outlined in Permit Sections 11.4 through 11.6. If  
17 the Department determines that the cleanup levels included in Permit Sections 11.4 through 11.6  
18 cannot be achieved at a site, the Department will require performance of risk analyses to  
19 establish alternate cleanup levels. Such risk analyses shall be prepared in the format included in  
20 the Permit Section 11.12 (*Reporting Requirements*). The Permittees shall submit to the  
21 Department for approval a Risk Assessment Report in accordance with this Permit Section  
22 (11.8.5.3) according to the schedule set forth by the Department for sites where risk analyses are  
23 conducted.

24 **11.8.6 Corrective Measures Evaluation**

25 **11.8.6.1 General**

26 The Department will require corrective measures at a unit if the Department determines, based  
27 on the Investigation Report and other relevant information available to the Department, that there  
28 has been a release of contaminants into the environment at the site and that corrective action is  
29 necessary to protect human health or the environment from such a release. Upon making such a  
30 determination, the Department will notify the Permittees in writing. The Department will  
31 specify a date for the submittal of the necessary reports and evaluations in the written  
32 notification.

33 **11.8.6.2 Corrective Measures Evaluation Report**

34 Following written notification from the Department that a corrective measures evaluation is  
35 required, the Permittees shall submit to the Department for approval a Corrective Measures  
36 Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report  
37 format outlined in Permit Section 11.12 (*Reporting Requirements*). The corrective measures

1 evaluation shall evaluate potential remedial alternatives and shall recommend a preferred remedy  
2 that will be protective of human health and the environment and that will attain the appropriate  
3 cleanup goals. The Corrective Measures Evaluation Report shall, at a minimum, comply with  
4 Permit Section 11.12 (Reporting Requirements) and include the following:

- 5 1. a description of the location, status, and current use of the site;
- 6 2. a description of the history of site operations and the history of releases of contaminants;
- 7 3. a description of site surface conditions;
- 8 4. a description of site subsurface conditions;
- 9 5. a description of on- and off-site contamination in all affected media;
- 10 6. an identification and description of all sources of contaminants;
- 11 7. an identification and description of contaminant migration pathways;
- 12 8. an identification and description of potential receptors;
- 13 9. a description of cleanup standards or other applicable regulatory criteria;
- 14 10. an identification and description of a range of remedy alternatives;
- 15 11. remedial alternative pilot or bench scale testing results;
- 16 12. a detailed evaluation and rating of each of the remedy alternatives, applying the criteria  
17 set forth in Permit Section 11.12 (Reporting Requirements);
- 18 13. an identification of a proposed preferred remedy or remedies;
- 19 14. design criteria of the selected remedy or remedies; and
- 20 15. a proposed schedule for implementation of the preferred remedy.

### 21 **11.8.6.3 Cleanup Standards**

22 Following written notification from the Department that a corrective measures evaluation is  
23 required, the Permittees shall submit to the Department for approval a Corrective Measures  
24 Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report  
25 format outlined in Permit Section 11.12 (*Reporting Requirements*). The corrective measures  
26 evaluation shall evaluate. The Permittees shall select corrective measures that are capable of  
27 achieving the clean-up standards and goals outlined in Permit Sections 11.4 through 11.6 (*Clean-*  
28 *up Levels*) including, as applicable, approved alternate clean-up goals established by a risk  
29 assessment.

1 **11.8.6.4 Remedy Evaluation Criteria**

2 **11.8.6.4.i Threshold Criteria**

3 The Permittees shall evaluate each of the remedy alternatives for the following threshold criteria.  
4 To be selected, the remedy alternative must:

- 5 1. be protective of human health and the environment;
- 6 2. attain media cleanup standards;
- 7 3. control the source or sources of releases so as to reduce or eliminate, to the extent  
8 practicable, further releases of contaminants that may pose a threat to human health and  
9 the environment; and
- 10 4. comply with applicable standards for management of wastes.

11 **11.8.6.4.ii Remedial Alternative Evaluation Criteria**

12 The Permittees shall evaluate each of the remedy alternatives for the factors described in this  
13 Permit Section (11.8.6.4). These factors shall be balanced in proposing a preferred alternative.

14 **11.8.6.4.iii Long-term Reliability and Effectiveness**

15 The remedy shall be evaluated for long-term reliability and effectiveness. This factor includes  
16 consideration of the magnitude of risks that will remain after implementation of the remedy; the  
17 extent of long-term monitoring, or other management that will be required after implementation  
18 of the remedy; the uncertainties associated with leaving contaminants in place; and the potential  
19 for failure of the remedy. The Permittees shall give preference to a remedy that reduces risks  
20 with little long-term management, and that has proven effective under similar conditions.

21 **11.8.6.4.iv Reduction of Toxicity, Mobility, or Volume**

22 The remedy shall be evaluated for its reduction in the toxicity, mobility, and volume of  
23 contaminants. The Permittees shall give preference to a remedy that uses treatment to more  
24 completely and permanently reduce the toxicity, mobility, and volume of contaminants.

25 **11.8.6.4.v Short-Term Effectiveness**

26 The remedy shall be evaluated for its short-term effectiveness. This factor includes  
27 consideration of the short-term reduction in existing risks that the remedy would achieve; the  
28 time needed to achieve that reduction; and the short-term risks that might be posed to the  
29 community, workers, and the environment during implementation of the remedy. The Permittees  
30 shall give preference to a remedy that quickly reduces short-term risks, without creating  
31 significant additional risks.

1 **11.8.6.4.vi Implementability**

2 The remedy shall be evaluated for its implementability or the difficulty of implementing the  
3 remedy. This factor includes consideration of installation and construction difficulties; operation  
4 and maintenance difficulties; difficulties with cleanup technology; permitting and approvals; and  
5 the availability of necessary equipment, services, expertise, and storage and disposal capacity.  
6 The Permittees shall give preference to a remedy that can be implemented quickly and easily,  
7 and poses fewer and lesser difficulties.

8 **11.8.6.4.vii Cost**

9 The remedy shall be evaluated for its cost. This factor includes a consideration of both capital  
10 costs, and operation and maintenance costs. Capital costs shall include, without limitation,  
11 construction and installation costs; equipment costs; land development costs; and indirect costs  
12 including engineering costs, legal fees, permitting fees, startup and shakedown costs, and  
13 contingency allowances. Operation and maintenance costs shall include, without limitation,  
14 operating labor and materials costs; maintenance labor and materials costs; replacement costs;  
15 utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency  
16 allowances. All costs shall be calculated based on their net present value. Permittees shall give  
17 preference to a remedy that is less costly, but does not sacrifice protection of health and the  
18 environment.

19 **11.8.6.5 Approval of Corrective Measures Evaluation Report**

20 The Department will review and approve the Corrective Measures Evaluation Report in  
21 accordance with Permit Section 11.9. If the Department disapproves the Corrective Measures  
22 Evaluation Report, the Department will notify the Permittees in writing of the Corrective  
23 Measures Evaluation Report's deficiencies and specify a due date for submission of a revised  
24 Corrective Measures Evaluation Report. Upon receipt of such notification of disapproval, the  
25 Permittees shall submit to the Department, within the specified time, a revised Corrective  
26 Measures Evaluation Report that corrects the deficiencies. If the Department approves the  
27 Corrective Measures Evaluation Report, the Department will notify the Permittees in writing.

28 **11.8.6.6 Relationship to Corrective Action Requirements**

29 The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes  
30 of RCRA compliance [See 55 Fed. Reg. 30875-77 (July 27, 1990) (proposed 40 CFR §§ 264.520  
31 through 264.524)].

32 **11.8.6.7 Statement of Basis**

33 Upon approval of the Corrective Measures Evaluation Report, the Department will select a  
34 remedy or remedies for the unit. The Department may choose a different remedy from that  
35 recommended by the Permittees. The Department will issue a Statement of Basis for selection of  
36 the remedy, and will receive public comment on the remedy. The public comment period will  
37 extend for at least 45 days from the date of the public notice of the Statement of Basis. The  
38 Department will provide an opportunity for a public hearing on the remedy, at which all

1 interested persons will be given a reasonable chance to submit data, views or arguments orally or  
2 in writing and to examine witnesses testifying at the hearing. The comment period will  
3 automatically be extended to the close of the public hearing. The public hearing will follow the  
4 hearing requirements under section 20.4.1.901.F NMAC. The Department will select a final  
5 remedy and issue a response to public comments to all commenters, after the end of the public  
6 comment period. In selecting a remedy, the Department will follow the public participation  
7 requirements applicable to remedy selection under 40 CFR § 270.41 and 20.4.1.901 NMAC.

8 The administrative record for the Facility will be made available to the public for review at the  
9 Department's offices in Santa Fe, New Mexico. All significant written and signed comments,  
10 including e-mailed comments, will be considered by the Department prior to approving a final  
11 remedy or remedies.

12 The Department's decision on the final remedy or remedies shall follow the requirements under  
13 section 20.4.1.901 NMAC, Secretary's Decision. The Department will issue a response to public  
14 comments at the time of the Department's final decision.

## 15 **11.8.7 Corrective Measures Implementation**

### 16 **11.8.7.1 General**

17 The Permittees shall implement the final remedy selected by the Department.

### 18 **11.8.7.2 Corrective Measures Implementation Plan**

19 Within 90 days after the Department's selection of a final remedy, or as otherwise specified by  
20 the schedule contained in the approved Corrective Measure Evaluation Report or as specified by  
21 a schedule required by the Department in the written approval notification, the Permittees shall  
22 submit to the Department for approval a Corrective Measures Implementation Plan outlining the  
23 design, construction, operation, maintenance, and performance monitoring for the selected  
24 remedy, and a schedule for its implementation. The implementation plan shall be submitted to  
25 the Department for review in accordance with the procedures in Permit Section 11.9. The  
26 Corrective Measures Implementation Plan shall, at a minimum, include the following elements:

- 27 1. a description of the selected final remedy;
- 28 2. a description of the cleanup goals and remediation system objectives;
- 29 3. an identification and description of the qualifications of all persons, consultants, and  
30 contractors that will be implementing the remedy;
- 31 4. detailed engineering design drawings and systems specifications for all elements of the  
32 remedy;
- 33 5. a construction work plan;
- 34 6. an operation and maintenance plan;

- 1 7. the results of any remedy pilot tests;
- 2 8. a plan for monitoring the performance of the remedy, including sampling and laboratory  
3 analysis of all affected media;
- 4 9. a waste management plan;
- 5 10. a proposed schedule for submission to the Department of periodic progress reports; and
- 6 11. a proposed schedule for implementation of the remedy.

### 7 **11.8.7.3 Health and Safety Plan**

8 The Permittees shall conduct all activities in accordance with a site-specific or facility-wide  
9 Health and Safety Plan during all construction, operation, maintenance, and monitoring activities  
10 conducted during corrective measures implementation.

### 11 **11.8.7.4 Progress Reports**

12 The Permittees shall submit to the Department progress reports in accordance with the schedule  
13 approved in the Corrective Measures Implementation Plan. The progress reports shall, at a  
14 minimum, include the following information:

- 15 1. a description of the remedy work completed during the reporting period;
- 16 2. a summary of problems, potential problems, or delays encountered during the reporting  
17 period;
- 18 3. a description of actions taken to eliminate or mitigate the problems, potential problems,  
19 or delays;
- 20 4. a discussion of the remedy work projected for the next reporting period, including all  
21 sampling events;
- 22 5. copies of the results of all monitoring, including sampling and analysis, and other data  
23 generated during the reporting period; and
- 24 6. copies of all waste disposal records generated during the reporting period.

### 25 **11.8.8 Remedy Completion**

#### 26 **11.8.8.1 Remedy Completion Report**

27 Within 90 days after completion of remedy, the Permittees shall submit to the Department a  
28 Remedy Completion Report. The report shall, at a minimum, include the following items:

- 29 1. a summary of the work completed;

- 1       2. a statement, signed by a registered professional engineer, that the remedy has been  
2           completed in accordance with the Department approved work plan for the remedy;
- 3       3. as-built drawings and specifications signed and stamped by a registered professional  
4           engineer;
- 5       4. copies of the results of all monitoring, including sampling and analysis, and other data  
6           generated during the remedy implementation, if not already submitted in a progress  
7           report;
- 8       5. copies of all waste disposal records, if not already submitted in a progress report; and
- 9       6. a certification, signed by a responsible official of DOE/LANS (owner/operator), stating:  
10           “I certify under penalty of law that this document and all attachments were prepared  
11           under my direction or supervision according to a system designed to assure that qualified  
12           personnel properly gather and evaluate the information submitted. Based on my inquiry  
13           of the person or persons who manage the system, or those persons directly responsible for  
14           gathering the information, the information submitted is, to the best of my knowledge and  
15           belief, true, accurate, and complete. I am aware that there are significant penalties for  
16           submitting false information, including the possibility of fine and imprisonment for  
17           knowing violations.”

#### 18   **11.8.9    Accelerated Clean-up Process**

19   If the Permittees identify a corrective action or measure that, if implemented voluntarily, will  
20   reduce risks to human health and the environment to levels acceptable to the Department, will  
21   reduce cost and/or will achieve cleanup of a unit ahead of schedule, the Permittees may  
22   implement the corrective measure as provided in this Permit Section (11.8.9), in lieu of the  
23   process established in Permit Section 11.8. The accelerated cleanup process shall be used at sites  
24   to implement presumptive remedies at small-scale and relatively simple sites where groundwater  
25   contamination is not a component of the accelerated cleanup, where the remedy is considered to  
26   be the final remedy for the site, and where the field work will be accomplished within 180 days  
27   of the commencement of field activities. The proposed accelerated cleanup will be documented  
28   in an Accelerated Corrective Measure Work Plan, which shall include:

- 29       1. a description of the proposed remedial action, including details of the unit or activity that  
30           is subject to the requirements of this Permit;
- 31       2. an explanation of how the proposed cleanup action is consistent with the overall  
32           corrective action objectives and requirements of this Permit;
- 33       3. the methods and procedures for characterization and remediation sample collection and  
34           analyses; and
- 35       4. a schedule for implementation and reporting on the proposed cleanup action.

1 The Permittees shall notify the Department of the planned accelerated corrective measure a  
2 minimum of 30 days prior to the commencement of any accelerated field activity. The  
3 notification shall include the submittal of the Plan if not already submitted to the Department.

#### 4 **11.8.9.1 Accelerated Corrective Measures Work Plan**

5 The Permittees shall obtain approval of an Accelerated Corrective Measures Work Plan prior to  
6 implementation. The Permittees shall prepare the Work Plan in general accordance with the  
7 requirements of Permit Section 11.12 (*Reporting Requirements*). The Work Plan shall be  
8 submitted to the Department for review in accordance with the procedures in Permit Section  
9 11.9. If the Department disapproves the Accelerated Corrective Measures Work Plan, the  
10 Department will notify the Permittees in writing of the Plan's deficiencies and specify a due date  
11 for submission of a revised Accelerated Corrective Measures Work Plan. The Permittees shall  
12 include an implementation schedule in the revised Accelerated Corrective Measures Work Plan.

#### 13 **11.8.9.2 Accelerated Corrective Measures Implementation**

14 The Permittees shall implement the accelerated corrective measures in accordance with the  
15 approved Accelerated Corrective Measures Work Plan. Within 90 days of completion of the  
16 accelerated corrective measures, the Permittees shall submit to the Department for approval a  
17 Remedy Completion Report in a format approved by the Department in general accordance with  
18 Permit Section 11.12 (*Reporting Requirements*). If upon review, the Department identifies any  
19 deficiencies in the Remedy Completion Report, the Department will notify the Permittees in  
20 writing.

### 21 **11.9 APPROVAL OF SUBMITTALS**

22 All monitoring plans; work plans, including Investigation Work Plans, Interim Measures Work  
23 Plans, Accelerated Corrective Measures Work Plans, and Corrective Measures Implementation  
24 Plans; Corrective Measures Evaluation Reports; and all associated schedules that the Permittees  
25 prepare under the terms of this Permit must be approved by the Department. Upon receiving a  
26 work plan or other document for approval, the Department will review the document and either  
27 approve the document, approve it with modifications or direction, or disapprove it. If the  
28 Department approves the document, it will notify the Permittees in writing. If the Department  
29 approves the document with modifications, the Department will notify the Permittees in writing  
30 of the necessary modifications, and the reasons for the modifications. If the Department  
31 disapproves a document, it will notify the Permittees in writing of the disapproval and the  
32 deficiencies in the document or other reasons for the disapproval. A notice of disapproval may  
33 also state modifications necessary for the Department approval. Upon receipt of a notice of  
34 disapproval, the Permittees shall revise the work plan or other document to incorporate all  
35 modifications and correct all deficiencies. Within 30 days after receipt of a notice of  
36 disapproval, or such other time as specified by the Department, the Permittees shall submit the  
37 revised work plan or other document to the Department for approval.

38 Upon Department approval, all monitoring plans, work plans, and Corrective Measures  
39 Evaluation Reports, and associated schedules are incorporated herein by reference and become

1 an enforceable part of this Permit, and therefore become enforceable under the provisions of the  
2 HWA and RCRA.

3 Investigation Reports, Monitoring Reports, Interim Measures Reports, Corrective Measures  
4 Implementation Reports, Remedy Completion Reports or other documents required under 20.4.1  
5 NMAC must also be submitted to the Department, but the Department will not necessarily  
6 approve such documents. After submittal of such a report, the Department may nevertheless  
7 require the Permittees to revise such reports to correct deficiencies or conduct additional work  
8 before the Department concludes that corrective action is complete.

## 9 **11.10 METHODS AND PROCEDURES**

10 The Permittees shall submit to the Department, for review and written approval, site-specific work  
11 plans for sites prior to the commencement of field activities where environmental investigation,  
12 corrective action, sampling or monitoring is being conducted or proposed. The site-specific work  
13 plans shall include the methods to be used to conduct all activities at each site or unit and shall be  
14 prepared in accordance with the format described in the Permit Section 11.12 (*Reporting*  
15 *Requirements*). The Permittees shall provide notification to the Department of corrective action  
16 field activities a minimum of 15 days prior to commencing the activity.

17 The methods used to conduct investigation, remediation, and monitoring activities shall be  
18 sufficient to fulfill the requirements of this Permit and provide accurate data for the evaluation of  
19 site conditions, the nature and extent of contamination and contaminant migration, and for remedy  
20 selection and implementation, where necessary. The methods presented in this Permit Section  
21 (11.10) are minimum requirements for environmental investigation and sampling, and are not  
22 intended to include all methods that may be necessary to fulfill the requirements of this Permit.  
23 The methods for conducting investigations, corrective actions, and monitoring at the Facility must  
24 be determined based on the conditions and contaminants that exist at each site or unit.

### 25 **11.10.1 Standard Operating Procedures**

26 The Permittees shall provide a brief description of investigation, sampling or analytical methods  
27 and procedures in documents submitted to the Department that includes sufficient detail to  
28 evaluate the quality of the acquired data. Facility standard operating procedures (SOPs) shall not  
29 be substituted for such descriptions.

### 30 **11.10.2 Investigation, Sampling, and Analysis Methods**

#### 31 **11.10.2.1 Introduction and Purpose**

32 This Permit Section (11.10.2) provides minimum requirements for field investigations, sample  
33 collection, handling and screening procedures, field and laboratory sample analysis, and quality  
34 assurance procedures for samples of the medium being investigated or tested at the Facility.

35 The purpose of this Section is to: 1) provide minimum requirements for drilling and sample  
36 collection in exploratory borings and other excavations; 2) provide minimum requirements for  
37 sampling of the target media; 3) provide minimum requirements for monitoring of groundwater

1 and vadose zone conditions; and 4) identify minimum required screening, analytical, and quality  
2 assurance procedures that shall be implemented during field sampling activities and laboratory  
3 analyses.

4 The quality assurance procedures referenced in the previous paragraph include: 1) the Facility  
5 investigation data quality objectives; 2) the requirements for QA/QC to be followed during field  
6 investigations and by the analytical laboratories; and 3) the methodology for the review and  
7 evaluation of the field and laboratory QA/QC results and documentation.

#### 8 **11.10.2.2 Field Exploration Activities**

9 Exploratory borings shall be advanced at locations specified in the Department approved site-  
10 specific work plans. The Department may require additional exploratory borings to fulfill the  
11 requirements of this Permit. Any additional boring locations, if required, will be determined or  
12 approved by the Department. The depths and locations of all exploratory and monitoring well  
13 borings shall be specified in the site-specific work plans submitted to the Department for approval  
14 prior to the start of the respective field activities. The Department must approve proposed unit  
15 aggregates grouped for the purpose of site investigation, remediation, and/or monitoring activities.

#### 16 **11.10.2.3 Sub-Surface Features/Utility Geophysical Surveys**

17 The Permittees shall conduct surveys to locate underground utilities, pipelines structures, drums,  
18 debris, and other buried features, including buried waste, in the shallow subsurface prior to the start  
19 of field exploration activities. The methods used to conduct the surveys, such as magnetometer,  
20 ground penetrating radar, resistivity, or other methods, shall be selected based on the  
21 characteristics of the site and the possible or suspected underground structures. The results of the  
22 surveys shall be included in the investigation reports submitted to the Department.

#### 23 **11.10.2.4 Drilling and Soil, Rock, and Sediment Sampling**

##### 24 **11.10.2.4.i Drilling**

25 Exploratory and monitoring well borings shall be drilled using the most effective, proven, and  
26 practicable method for recovery of undisturbed samples and potential contaminants. The  
27 Department shall approve the drilling methods selected for advancement of each boring prior to the  
28 start of field activities. Based on the drilling conditions, the borings shall be advanced using one of  
29 the following methods:

- 30 1. hollow-stem auger;
- 31 2. air rotary;
- 32 3. mud rotary;
- 33 4. percussion hammer;
- 34 5. sonic;

- 1       6. dual wall air rotary;
- 2       7. direct Push Technology (DPT);
- 3       8. cryogenic; and
- 4       9. cable tool.

5 Hollow-stem auger or DPT drilling methods are preferred if vapor-phase or VOC contamination is  
6 known or suspected to be present. The type of drilling fluid used, if necessary, shall be approved  
7 by the Department prior to the start of drilling activities or prior to use at any site.

8 All drilling equipment shall be in good working condition and capable of performing the assigned  
9 task. Drilling rigs and equipment shall be operated by properly trained, experienced, and  
10 responsible crews. The Permittees are responsible for ensuring that contaminants from another site  
11 or facility are not introduced into the site under investigation due to malfunctioning equipment or  
12 poor site maintenance. The drilling equipment shall be properly decontaminated before drilling  
13 each boring.

14 Exploratory borings shall be advanced to unit- and location-specific depths specified or approved  
15 by the Department. The Permittees shall propose drilling depths in the site-specific work plans  
16 submitted for each subject area. Unless otherwise specified by the Department, the borings shall  
17 be advanced to the following minimum depths:

- 18       1. in all borings, 25 ft below the deepest detected contamination based on field screening,  
19       laboratory analyses, and/or previous investigations at the site;
- 20       2. 20 ft below the base of disposal units if contamination is not detected;
- 21       3. five ft below the base of shallow structures such as tanks, piping or building sumps, or  
22       other building structures;
- 23       4. 50 ft below the deepest known intermediate perched groundwater zone;
- 24       5. 50 ft below the top of the regional aquifer; and
- 25       6. depths specified by the Department based on regional or unit specific data needs.

26 The Permittees shall notify the Department as early as practicable if conditions arise or are  
27 encountered that do not allow the advancement of borings to the depths specified by the  
28 Department or proposed in an approved work plan so that alternative actions may be discussed.  
29 Precautions shall be taken to prevent the migration of contaminants between geologic, hydrologic,  
30 or other identifiable zones during drilling and well installation activities. Contaminant zones shall  
31 be isolated from other zones encountered in the borings.

32 The drilling and sampling shall be accomplished under the direction of a qualified engineer or  
33 geologist who shall maintain a detailed log of the materials and conditions encountered in each  
34 boring. Both sample information and visual observations of the cuttings and core samples shall be

1 recorded on the boring log. Known site features and/or site survey grid markers shall be used as  
2 references to locate each boring prior to surveying the location as described in Permit Section  
3 11.10.2.6. The boring locations shall be measured to the nearest foot, and locations shall be  
4 recorded on a scaled site map upon completion of each boring.

5 Trenching and other exploratory excavation methods shall follow the applicable general  
6 procedures outlined in this Permit Section. The particular methods proposed for use by the  
7 Permittees for exploratory excavation and sampling at any specific unit shall be included in the  
8 site-specific investigation work plan submitted to the Department. The Department will include  
9 any changes or additional requirements for conducting exploratory excavation and sampling  
10 activities at the subject unit in its response to the Permittees after review of the investigation work  
11 plans.

#### 12 **11.10.2.4.ii Soil and Rock Sampling**

13 Relatively undisturbed discrete soil and rock samples shall be obtained, where possible, during the  
14 advancement of each boring for the purpose of logging, field screening, and analytical testing.  
15 Generally, the samples shall be collected at the following intervals and depths:

- 16 1. at 5-ft intervals, 10-ft intervals, continuously, or as approved by the Department;
- 17 2. at the depth immediately below the base of the disposal unit or facility structure;
- 18 3. at the maximum depth of each boring;
- 19 4. at the depths of contacts or first encounter, observed during drilling, with geologic units  
20 of different lithology, changes in structural or textural characteristics, or zones of  
21 relatively higher or lower permeability;
- 22 5. of soil or rock types relatively more likely to sorb or retain contaminants than  
23 surrounding lithology;
- 24 6. at the depth of the first encounter, during drilling, with shallow or intermediate saturated  
25 zones;
- 26 7. at intervals suspected of being source or contaminated zones;
- 27 8. at the top of the regional aquifer; and
- 28 9. at other intervals approved or required by the Department.

29 The sampling interval for the borings may be modified, or samples may be obtained from a  
30 specific depth, based on field observations. A decontaminated split-barrel sampler lined with  
31 brass sleeves, a coring device, or other method approved by the Department shall be used to obtain  
32 samples during the drilling of each boring.

33 A split barrel sampler lined with brass sleeves or a coring device is the preferred sampling method  
34 for borehole soil, rock, and sediment sampling. The following procedures should be followed if a

1 split barrel sampler is used. Upon recovery of the sample, one or more brass sleeves shall be  
2 removed from the split barrel sampler and the open ends of the sleeves covered with Teflon tape or  
3 foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical  
4 laboratory. If brass sleeves are not used, a portion of the sample shall be placed in pre-cleaned,  
5 laboratory-prepared sample containers for laboratory chemical analysis. The remaining portions  
6 of the sample shall be used for logging and field screening, as described in Sections 11.10.2.4.v  
7 and 11.10.2.4.vi of this Permit Part, respectively.

8 Discrete samples shall be collected for field screening and laboratory analyses. Homogenization of  
9 discrete samples collected for analyses other than for VOC and SVOC analyses shall be performed  
10 by the analytical laboratory, if necessary. The Permittees may submit site-specific, alternative  
11 methods for homogenization of samples in the field to the Department for review and written  
12 approval.

13 Samples to be submitted for laboratory analyses shall be selected based on: 1) the results of the  
14 field screening or mobile laboratory analyses; 2) the position of the sample relative to groundwater,  
15 suspected releases, or site structures; 3) the sample location relative to former or altered site  
16 features or structures; 4) suspected migration pathways and the stratigraphy encountered in the  
17 boring; and 5) the specific objectives and requirements of this Permit and the approved site-  
18 specific work plan. The proposed number of samples and analytical parameters shall be included  
19 as part of the site-specific work plan submitted to the Department for approval prior to the start of  
20 field investigation activities at each unit. The work plans shall allow for flexibility in modifying  
21 the project-specific tasks based on information obtained during the course of the investigation.  
22 Modifications to site-specific work plan tasks must be pre-approved in writing by the Department.

#### 23 **11.10.2.4.iii Sediment Sampling**

24 Sediment samples shall be collected in the same manner as described in Permit Section 11.10.2.4.ii  
25 for soil and rock sampling where borings are drilled to explore alluvial subsurface conditions. The  
26 sampling device shall be a decontaminated, hand-held stainless steel coring device, shelly tube,  
27 thin-wall sampler, or other device approved by the Department where sediment sampling is  
28 conducted without the use of the drilling methods described in Permit Section 11.10.2.4.i. The  
29 samples shall be transferred to pre-cleaned laboratory prepared containers for submittal to the  
30 laboratory. Samples obtained for volatiles analysis shall be collected using shelly tubes, thin-wall  
31 samplers, or other device approved by the Department. The ends of the samplers shall be lined  
32 with Teflon tape or aluminum foil and sealed with plastic caps fastened to the sleeves with tape for  
33 shipment to the analytical laboratory.

34 The physical characteristics of the sediment (such as mineralogy, ASTM soil classification, AGI  
35 (American Geological Institute) rock classification, moisture content, texture, color, presence of  
36 stains or odors, and/or field screening results), depth where each sample was obtained, method of  
37 sample collection, and other observations shall be recorded in the field log.

#### 38 **11.10.2.4.iv Drill Cuttings (Investigation Derived Waste)**

39 Drill cuttings, excess sample material and decontamination fluids, and all other investigation  
40 derived waste (IDW) shall be contained and characterized using methods based on the boring

1 location, boring depth, drilling method, and type of contaminants suspected or encountered.  
2 Proposed IDW management shall be included with the unit-specific investigation work plan  
3 submitted to the Department for approval prior to the start of field investigations. The Department  
4 shall approve the method of containment for drill cuttings prior to the start of drilling activities.  
5 Borings not completed as groundwater or vapor monitoring wells shall be properly abandoned in  
6 accordance with the methods listed in Permit Section 11.11.6 or other method approved by the  
7 Department. Borings completed as groundwater monitoring wells shall be constructed in  
8 accordance with the requirements described in Permit Section 11.11.3.2 (*Well Construction*  
9 *Methods*).

#### 10 **11.10.2.4.v Logging of Soil/Rock and Sediment Samples**

11 Samples obtained from all exploratory borings and excavations shall be visually inspected and the  
12 soil or rock type classified in general accordance with ASTM D2487 (Unified Soil Classification  
13 System) and D2488, or AGI Methods for soil and rock classification. Detailed logs of each boring  
14 shall be completed in the field by a qualified engineer or geologist. Additional information, such  
15 as the presence of water-bearing zones and any unusual or noticeable conditions encountered  
16 during drilling shall be recorded on the logs. Field boring logs, test pit logs, and field well  
17 construction diagrams shall be converted to the format acceptable for use in final reports submitted  
18 to the Department. If requested, draft boring logs, test pit logs, and well construction diagrams  
19 shall be submitted to the Department for review within 30 days after the completion of each boring  
20 or monitoring well.

#### 21 **11.10.2.4.vi Soil, Rock, and Sediment Sample Field Screening**

22 Samples obtained from borings shall be screened in the field for evidence of the potential presence  
23 of contaminants. Field screening results shall be recorded on the exploratory boring and  
24 excavation logs. Field screening results are used as a general guideline to determine the nature and  
25 extent of possible contamination. In addition, screening results shall be used to aid in the selection  
26 of soil, rock, sediment, and vapor-phase samples for laboratory analysis. The Department  
27 recognizes that field screening alone will not detect the possible presence or full nature and extent  
28 of all contaminants that may be encountered at the site.

29 The primary screening methods to be used shall include: 1) visual examination; 2) headspace vapor  
30 screening for VOCs; and 3) metals screening using X-ray fluorescence (XRF). Additional  
31 screening for site- or release-specific characteristics such as pH, High Explosives (HE), Total  
32 Petroleum Hydrocarbons (TPH), nitrates, or for other specific compounds using field test kits shall  
33 be conducted where appropriate.

34 Headspace vapor screening shall target VOCs and shall be conducted by placing a soil or rock  
35 sample in a plastic sample bag or a foil-sealed container allowing space for ambient air. The  
36 container shall be sealed and then shaken gently to expose the soil or rock to the air trapped in the  
37 container. The sealed container shall be allowed to rest for a minimum of five minutes while  
38 vapors equilibrate. Vapors present within the sample bag headspace will then be measured by  
39 inserting the probe of the instrument in a small opening in the bag or through the foil. The  
40 maximum value and the ambient air temperature shall be recorded on the field boring or test pit log

1 for each sample. The monitoring instruments shall be calibrated each day to the manufacturer's  
2 standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or  
3 higher electron volt (eV) lamp, combustible gas indicator, or other instrument approved by the  
4 Department shall be used for VOC field screening. The limitations, precision, and calibration  
5 procedures of the instrument to be used for VOC field screening shall be included in the site-  
6 specific investigation work plan prepared for each unit.

7 XRF may be used to screen soil, rock, or sediment samples for the presence of metals. XRF  
8 screening requires proper sample preparation and proper instrument calibration. Sample  
9 preparation and instrument calibration procedures shall be documented in the field logs. The  
10 methods and procedures for sample preparation and instrument calibration shall be approved by the  
11 Department prior to the start of field activities. Field XRF screening results for selected metals  
12 may be used in lieu of laboratory analyses upon written approval by the Department; however, the  
13 results shall, at a minimum, be confirmed by laboratory analyses at a frequency of 20 percent (1  
14 sample per every 5 analyzed by XRF analysis).

15 Field screening results are site- and boring-specific and the results vary with instrument type,  
16 media screened, weather conditions, moisture content, soil or rock type, and type of contaminant.  
17 The Permittees shall record on the field logs all conditions capable of influencing the results of  
18 field screening. The Permittees shall submit to the Department conditions potentially influencing  
19 field screening results as part of the site-specific investigation, remediation, or monitoring reports.

20 At a minimum, the Permittees shall submit the samples with the greatest apparent degree of  
21 contamination, based on field observations and field screening, for laboratory analysis. The  
22 Permittees shall also use the location of the sample relative to groundwater, stratigraphic units or  
23 contacts, and the proximity to significant site or subsurface features or structures as a guideline for  
24 sample selection. In addition, the Permittees shall submit the samples with no or little apparent  
25 contamination, based on field screening, for laboratory analysis if the intention is to confirm that  
26 the base (or other depth interval) of a boring or other sample location is not contaminated.

#### 27 **11.10.2.4.vii Soil, Rock, and Sediment Sample Types**

28 The Permittees shall collect soil, rock, and sediment samples at the frequencies outlined in the site-  
29 specific investigation, corrective action, or monitoring work plans for each unit, or other site  
30 submitted by the Permittees for review and written approval by the Department. The samples  
31 collected shall be representative of the media and site conditions being investigated or monitored.  
32 The Permittees shall collect QA/QC samples to monitor the validity of the soil, rock, and sediment  
33 sample collection procedures. Field duplicates will be collected at a rate of ten percent. The  
34 Permittees shall collect equipment blanks from all sampling apparatus at a frequency of ten percent  
35 for chemical analysis. Equipment blanks shall be collected at a frequency of one per day if  
36 disposable sampling equipment is used. The Permittees shall collect field blanks at a frequency of  
37 one per day for each medium (with the exception of air samples) at each unit, or other site.  
38 Reagent blanks shall be used if chemical analytical procedures requiring reagents are employed in  
39 the field as part of the investigation or monitoring program. The resulting data will provide  
40 information on the variability associated with sample collection, handling, and laboratory analysis

1 operations. The blanks and duplicates shall be submitted for laboratory analyses associated with  
2 the project-specific contaminants, data quality concerns, and media being sampled.

3 **11.10.2.5 Sample Point and Structure Location Surveying**

4 The horizontal and vertical coordinates of the top of each monitoring well casing and the ground  
5 surface at each monitoring well location shall be determined by a registered New Mexico  
6 professional land surveyor in accordance with the State Plane Coordinate System (NMSA 1978  
7 47-1-49-56 (Repl. Pamp. 1993)). The surveys shall be conducted in accordance with Sections  
8 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional  
9 Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions  
10 shall be measured to the nearest 0.1-ft, and vertical elevations shall be measured to the nearest  
11 0.01-ft. The Permittees shall prepare site map(s), certified by a registered New Mexico  
12 professional land surveyor, presenting all surveyed locations and elevations including relevant site  
13 features and structures for submittal with all associated reports to the Department.

14 Site attributes (e.g., soil sample locations, sediment sample locations, springs, outfalls, pertinent  
15 structures, monitoring stations, as well as staked out sampling grids), shall be located by using  
16 the global positioning system (GPS), another the Department-approved surveying system, or by  
17 using a registered New Mexico Registered Land Surveyor using the methods described in the  
18 paragraph above. If using GPS, horizontal locations shall be measured to the nearest 0.5 ft. The  
19 Permittees shall provide the Department a statement of accuracy for survey data upon request.

20 **11.10.2.6 Subsurface Vapor-Phase Monitoring and Sampling**

21 Samples of subsurface vapors shall be collected from vapor monitoring points from both discrete  
22 zones, selected based on investigation and field screening results, and as total well subsurface  
23 vapor samples where required by the Department.

24 During subsurface drilling explorations at sites where there is a potential for vapor-phase  
25 contamination to be present, soil gas samples shall be obtained at the Department-approved  
26 intervals for field screening and/or laboratory analyses. An inflatable packer shall be dropped to  
27 isolate the bottom two to three feet of the borehole. The isolated portion of the borehole shall be  
28 purged by slowly removing approximately five times the volume of the annular space beneath the  
29 packer, followed by a VOC measurement using a PID equipped with a 11.7 eV lamp, a  
30 combustible gas indicator or other instrument approved by the Department. The data shall be  
31 logged and also used for determining the samples to be sent to an analytical laboratory.

32 The Permittees shall, as directed by the Department, collect vapor samples for field measurement  
33 of the following during subsurface vapor monitoring activities:

- 34 1. percent oxygen;
- 35 2. organic vapors (using a photo-ionization detector with an 11.7 eV (electron volt) lamp, a  
36 combustible vapor indicator or other method approved by the Department);
- 37 3. percent carbon dioxide;

- 1 4. static subsurface pressure; and
- 2 5. other parameters (such as carbon monoxide and hydrogen sulfide) as required by the
- 3 Department.

4 The Permittees also shall collect vapor samples for laboratory analysis of the following as required:

- 5 1. percent moisture;
- 6 2. VOCs; and
- 7 3. other analytes required by the Department.

8 Vapor samples analyzed by the laboratory for percent moisture and VOCs shall be collected using  
9 SUMMA canisters or other sample collection method approved by the Department. The samples  
10 shall be analyzed for VOC concentrations by EPA Method TO-15, as it may be updated or  
11 equivalent VOC analytical method.

12 Field vapor measurements, the date and time of each measurement, and the instrument used shall  
13 be recorded on a vapor monitoring data sheet. The instruments used for field measurements shall  
14 be calibrated daily in accordance with the manufacturer's specifications and as described in Permit  
15 Section 11.10.4. The methods used to obtain vapor-phase field measurements and samples shall be  
16 approved by the Department in writing prior to the start of air monitoring at each Facility site  
17 where vapor-phase monitoring is conducted.

#### 18 **11.10.2.7 Groundwater Monitoring**

##### 19 **11.10.2.7.i Groundwater Levels**

20 Groundwater level measurements shall be obtained at intervals required by the Department.  
21 Groundwater levels also shall be obtained prior to purging in preparation for a sampling event.  
22 Measurement data and the date and time of each measurement shall be recorded on a site  
23 monitoring data sheet. The depth to groundwater shall be measured to the nearest 0.01 feet. The  
24 depth to groundwater shall be recorded relative to the surveyed well casing rim or other surveyed  
25 datum.

26 Groundwater levels shall be measured in all wells at the facility (or the number of wells otherwise  
27 specified in a Department approved groundwater monitoring work plan) within 14 days of the  
28 commencement of the monitoring activities. The Permittees shall conduct periodic measuring  
29 events, the schedule for which shall be provided in the groundwater monitoring work plans.

##### 30 **11.10.2.8 Groundwater Sampling**

31 Groundwater samples shall initially be obtained from newly installed monitoring wells between ten  
32 and 30 days after completion of well development. Groundwater monitoring and sampling shall be  
33 conducted at an interval approved by the Department after the initial sampling event. The  
34 Permittees shall sample all saturated zones screened to allow entry of groundwater into each

1 monitoring well during each sampling event (or as otherwise specified in the Department approved  
 2 groundwater monitoring work plan). All requests for variances from the groundwater sampling  
 3 schedule shall be submitted to the Department, in writing, no less than 30 days prior to the start of  
 4 scheduled monitoring and sampling events. Groundwater samples shall be collected from all  
 5 saturated zones, where possible, within exploratory borings not intended to be completed as  
 6 monitoring wells prior to abandonment of the borings.

7 Water samples shall be analyzed in accordance with the Department-approved groundwater  
 8 monitoring work plan for one or more of the following general chemistry parameters as required  
 9 by the Department:

nitrate/nitrite	sulfate	chloride	sodium
dissolved CO <sub>2</sub>	alkalinity	carbonate/bicarbonate	boron
fluoride	manganese	calcium	silicon
ferric/ferrous iron	ammonia	potassium	phosphorus/phosphate
sulfide	bromide	magnesium	methane
TKN	total organic carbon	total dissolved solids	

10

11 **11.10.2.8.i Well Purging**

12 All zones in each monitoring well shall be purged by removing groundwater prior to sampling and  
 13 in order to ensure that formation water is being sampled. Purge volumes shall be determined by  
 14 monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen  
 15 concentrations, turbidity, redox potential, and temperature during purging of volumes and at  
 16 measurement intervals approved by the Department in writing. The groundwater quality  
 17 parameters shall be measured using a flow-through cell and instruments approved by the  
 18 Department in writing. The volume of groundwater purged, the instruments used, and the readings  
 19 obtained at each interval shall be recorded on the field monitoring log. In general, water samples  
 20 may be obtained from the well after the measured parameters of the purge water have stabilized to  
 21 within ten percent for three consecutive measurements. Well purging may also be conducted in  
 22 accordance with the Department's Position Paper "Use of Low-Flow and other Non-Traditional  
 23 Sampling Techniques for RCRA Compliant Groundwater Monitoring" (October 30, 2001). The  
 24 Permittees may submit, to the Department for approval, a written request for a variance from the  
 25 described methods of well purging for individual wells no later than 90 days prior to scheduled  
 26 sampling activities. The Department will respond to the request, in writing, within 60 days of  
 27 receipt of the variance request.

1 **11.10.2.8.ii Groundwater Sample Collection**

2 Groundwater samples shall be obtained from each well after a sufficient amount of water has been  
3 removed from the well casing to ensure that the sample is representative of formation water.  
4 Groundwater samples shall be obtained using methods approved by the Department within twenty-  
5 four hours of the completion of well purging. Sample collection methods shall be documented in  
6 the field monitoring reports. The samples shall be transferred to the appropriate, clean, laboratory-  
7 prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody  
8 procedures are described in Permit Section 11.10.2.9. Decontamination procedures shall be  
9 established for reusable water sampling equipment as described in Permit Section 11.10.4.

10 All purged groundwater and decontamination water shall be temporarily stored at satellite  
11 accumulation areas or transfer stations in labeled 55-gallon drums, less-than-90-day storage areas  
12 or other containers approved by the Department until proper characterization and disposal can be  
13 arranged. The methods for disposal of purge/decontamination water shall be approved by the  
14 Department prior to removal from the temporary storage area. Disposable materials shall be  
15 handled as described in Permit Section 11.10.5.

16 Groundwater samples intended for metals analysis shall be submitted to the laboratory as total  
17 metals samples. If required by the Department, the Permittees shall obtain groundwater samples  
18 for dissolved metals analysis to be filtered using disposable in-line filters with a 0.45 micron or  
19 other mesh size approved by the Department.

20 **11.10.2.8.iii Surface Water Sample Collection**

21 Surface water samples shall be collected using methods approved by the Department. Samples  
22 shall be collected in clean laboratory-prepared sampling containers. The methods and instruments  
23 used to measure field parameters shall be approved by the Department prior to conducting surface  
24 water sampling. The sampling and monitoring techniques used and the measurements obtained  
25 shall be recorded in the field monitoring reports.

26 **11.10.2.8.iv Groundwater and Surface Water Sample Types**

27 Groundwater samples shall be collected from each monitoring well and surface water samples shall  
28 be collected at predetermined locations. Field duplicates, field blanks, equipment rinseate blanks,  
29 reagent blanks, if necessary, and trip blanks shall be obtained for quality assurance during  
30 groundwater and surface water sampling activities. The samples shall be handled as described in  
31 Permit Section 11.10.2.9.

32 Field duplicate surface water and groundwater samples shall be obtained at a frequency of ten  
33 percent. At a minimum, one duplicate sample per sampling event shall always be obtained.

34 Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field  
35 blanks shall be generated by filling sample containers in the field with deionized water and  
36 submitting the samples, along with the groundwater or surface water samples, to the analytical  
37 laboratory for the appropriate analyses.

1 Equipment rinsate blanks shall be obtained for chemical analysis at the rate of five percent but no  
2 fewer than one rinsate blank per sampling day. Equipment rinsate blanks shall be collected at a  
3 rate of one per sampling day if disposable sampling apparatus is used. Rinsate samples shall be  
4 generated by rinsing deionized water through unused or decontaminated sampling equipment. The  
5 rinsate sample then shall be placed in the appropriate sample container and submitted with the  
6 groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

7 Reagent blanks shall be obtained at a frequency of ten percent but no fewer than one per day per  
8 unit if chemical analyses requiring the use of chemical reagents are conducted in the field during  
9 water sampling activities.

10 Trip blanks shall accompany laboratory sample bottles and shipping and storage containers  
11 intended for VOC analyses. Trip blanks shall consist of a sample of analyte-free deionized water  
12 prepared by the laboratory and placed in an appropriate sample container. The trip blank shall be  
13 prepared by the analytical laboratory prior to the sampling event and shall be kept with the  
14 shipping containers and placed with other water samples obtained from the site each day. Trip  
15 blanks shall be analyzed at a frequency of one for each shipping container of samples.

#### 16 **11.10.2.9 Sample Handling**

17 At a minimum, the following procedures shall be used at all times when collecting samples during  
18 investigation, corrective action, and monitoring activities unless otherwise specified in a  
19 Department-approved work plan:

- 20 1. neoprene, nitrile, or other protective gloves shall be worn when collecting samples. New  
21 disposable gloves shall be used to collect each sample;
- 22 2. all samples collected of each medium for chemical analysis shall be transferred into clean  
23 sample containers supplied by the project analytical laboratory with the exception of soil,  
24 rock, and sediment samples obtained in brass sleeves, shelby tubes, thin wall samplers, or  
25 in Encore™ samplers. Upon recovery of the sample collected using split barrel samplers  
26 with brass sleeves, the brass sleeves shall be removed from the split barrel sampler and  
27 the open ends of the sleeves shall be lined with Teflon tape or foil and sealed with plastic  
28 caps. The caps shall be fastened to the sleeve with tape for storage and shipment to the  
29 analytical laboratory. Samples collected in shelby tubes or thin wall samplers shall be  
30 capped in a similar fashion. The sample depth and the top of the sample shall be clearly  
31 marked. Sample container volumes and preservation methods shall be in accordance with  
32 EPA SW-846 and established industry practices for use by accredited analytical  
33 laboratories. Sufficient sample volume shall be obtained for the laboratory to complete  
34 the method-specific QC analyses on a laboratory-batch basis; and
- 35 3. sample labels and documentation shall be completed for each sample following  
36 procedures included in the site-specific work plans approved by the Department.  
37 Immediately after the samples are collected, they shall be stored in a cooler with ice or  
38 other appropriate storage method until they are delivered to the analytical laboratory.  
39 Standard chain-of-custody procedures, as described in Permit Section 11.10.2.14.ii, shall  
40 be followed for all samples collected. All samples shall be submitted to the laboratory

1 soon enough to allow the laboratory to conduct the analyses within the method holding  
2 times. All samples shall be submitted to the laboratory within 48 hours after their  
3 collection.

4 Shipment procedures shall include the following:

- 5 1. individual sample containers shall be packed to prevent breakage and transported in a  
6 sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted  
7 method. The drainage hole at the bottom of the cooler shall be sealed and secured in case  
8 of sample container leakage. Temperature blanks shall be included with each shipping  
9 container;
- 10 2. each cooler or other container shall be delivered directly to the analytical laboratory;
- 11 3. glass bottles shall be separated in the shipping container by cushioning material to  
12 prevent breakage;
- 13 4. plastic containers shall be protected from possible puncture during shipping using  
14 cushioning material;
- 15 5. the chain-of-custody form and sample request form shall be shipped inside the sealed  
16 storage container to be delivered to the laboratory;
- 17 6. chain-of-custody seals shall be used to seal the sample-shipping container in  
18 conformance with EPA protocol; and
- 19 7. signed and dated chain-of-custody seals shall be applied to each cooler prior to transport  
20 of samples from the site.

#### 21 **11.10.2.10 In-Situ Testing**

22 In-situ permeability tests, remediation system pilot tests, stream flow tests, and other tests  
23 conducted to evaluate site and subsurface conditions shall be designed to accommodate specific  
24 site conditions and to achieve the test objectives. The testing methods shall be approved, in  
25 writing, by the Department prior to implementation. The tests shall be conducted in order to  
26 appropriately represent site conditions and in accordance with USGS, ASTM or other methods  
27 generally accepted by the industry. Detailed logs of all relevant site conditions and measurements  
28 shall be maintained during the testing events. If requested, a summary of the general test results,  
29 including unexpected or unusual test results and equipment failures or testing limitations shall be  
30 reported to the Department within 30 days of completion of the test. The summary shall be  
31 presented in a format acceptable to the Department and in general accordance with the report  
32 formats outlined in Permit Section 11.12 (*Reporting Requirements*). A report summarizing the  
33 results of each test shall be submitted to the Department within 120 days of completion of each  
34 test.

1 **11.10.2.11 Decontamination Procedures**

2 The objective of the decontamination procedures is to minimize the potential for cross-  
3 contamination. A designated decontamination area shall be established for decontamination of  
4 drilling equipment, reusable sampling equipment and well materials. The drilling rig shall be  
5 decontaminated prior to entering the site or unit. Drilling equipment or other exploration  
6 equipment that may come in contact with the borehole shall be decontaminated by steam cleaning,  
7 by hot-water pressure washing, or by other method approved by the Department prior to drilling  
8 each new boring.

9 Sampling or measurement equipment, including but not limited to, stainless steel sampling tools,  
10 split-barrel or core samplers, well developing or purging equipment, groundwater quality  
11 measurement instruments, and water level measurement instruments, shall be decontaminated in  
12 accordance with the following procedures or other methods approved by the Department before  
13 each sampling attempt or measurement:

- 14 1. brush equipment with a wire or other suitable brush, if necessary or practicable, to  
15 remove large particulate matter;
- 16 2. rinse with potable tap water;
- 17 3. wash with nonphosphate detergent or other detergent approved by the Department  
18 (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
- 19 4. rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap  
20 water rinse;
- 21 5. rinse with methanol (to remove organic compounds, if necessary) followed by a tap water  
22 rinse;
- 23 6. rinse with potable tap water; and
- 24 7. double rinse with deionized water.

25 All decontamination solutions shall be collected and stored temporarily as described in Permit  
26 Section 11.10.5. Decontamination procedures and the cleaning agents used shall be documented in  
27 the daily field log.

28 **11.10.2.12 Field Equipment Calibration Procedures**

29 Field equipment requiring calibration shall be calibrated to known standards, in accordance with  
30 the manufacturers' recommended schedules and procedures. At a minimum, calibration checks  
31 shall be conducted daily, or at other intervals approved by the Department, and the instruments  
32 shall be recalibrated, if necessary. Calibration measurements shall be recorded in the daily field  
33 logs. If field equipment becomes inoperable, its use shall be discontinued until the necessary  
34 repairs are made. In the interim, a properly calibrated replacement instrument shall be used.

1 **11.10.2.13 Collection and Management of Investigation Derived Waste**

2 Investigation derived waste (IDW) includes general refuse, drill cuttings, excess sample material,  
3 water (decontamination, development and purge), and disposable equipment generated during the  
4 course of investigation, corrective action, or monitoring activities. All IDW shall be properly  
5 characterized and disposed of in accordance with all Federal, State, and local rules and regulations  
6 for storage, labeling, handling, transport, and disposal of waste. The Permittees shall include a  
7 description of anticipated management of IDW as part of the applicable work plan submitted to the  
8 Department for approval prior to disposal of any IDW produced during investigation, corrective  
9 action, or monitoring activities. The Permittees may submit a request to the Department to dispose  
10 of IDW on a case-by-case basis prior to submittal of the applicable work plan.

11 All water generated during sampling and decontamination activities shall be temporarily stored at  
12 satellite accumulation areas or transfer stations in labeled 55-gallon drums or other containers  
13 approved by the Department until proper characterization and disposal can be arranged. The IDW  
14 may be characterized for disposal based on the known or suspected contaminants potentially  
15 present in the waste. The methods for waste characterization and disposal of IDW shall be  
16 approved by the Department prior to removal from the temporary storage area.

17 **11.10.2.14 Documentation of Field Activities**

18 **11.10.2.14.i General**

19 Daily field activities, including observations and field procedures, shall be recorded on appropriate  
20 forms. The original field forms shall be maintained at the Facility. Copies of the completed forms  
21 shall be maintained in a bound and sequentially numbered field file for reference during field  
22 activities. Indelible ink shall be used to record all field activities. Photographic documentation of  
23 field activities shall be performed, as appropriate. The daily record of field activities shall include  
24 the following:

- 25 1. site or unit designation;
- 26 2. date;
- 27 3. time of arrival and departure;
- 28 4. field investigation team members including subcontractors and visitors;
- 29 5. weather conditions;
- 30 6. daily activities and times conducted;
- 31 7. observations;
- 32 8. record of samples collected with sample designations and locations specified;
- 33 9. photographic log;

- 1 10. field monitoring data, including health and safety monitoring if conditions arise that  
2 require modification of required work;
- 3 11. equipment used and calibration records, if appropriate;
- 4 12. list of additional data sheets and maps completed;
- 5 13. an inventory of the waste generated and the method of storage or disposal; and
- 6 14. signature of personnel completing the field record.

7 **11.10.2.14.ii Sample Custody**

8 All samples collected for analysis shall be recorded in the field report or data sheets. Chain-of-  
9 custody forms shall be completed at the end of each sampling day, prior to the transfer of samples  
10 off site, and shall accompany the samples during shipment to the laboratory. A signed and dated  
11 custody seal shall be affixed to the lid of the shipping container. Upon receipt of the samples at the  
12 laboratory, the custody seals will be broken, the chain-of-custody form shall be signed as received  
13 by the laboratory, and the conditions of the samples shall be recorded on the form. The original  
14 chain-of-custody form shall remain with the laboratory and copies shall be returned to the  
15 relinquishing party. The Permittees shall maintain copies of all chain-of-custody forms generated  
16 as part of sampling activities. Copies of the chain-of-custody records (either paper copies or  
17 electronically scanned in PDF format) shall be included with all draft and final laboratory reports  
18 submitted to the Department.

19 **11.10.3 Chemical Analyses**

20 The Permittees shall submit all samples for laboratory analysis to accredited contract laboratories.  
21 The laboratories shall use the most recent EPA and industry-accepted extraction and analytical  
22 methods for chemical analyses for target analytes as the testing methods for each medium sampled.  
23 The Permittees shall use the most sensitive laboratory methods (with the lowest detection limits)  
24 available unless specific conditions preclude their use.

25 The Permittees shall submit a list of analytes and analytical methods to the Department, for review  
26 and written approval as part of each site-specific investigation, corrective action, or monitoring  
27 work plan. The detection limits for each method shall be less than applicable background,  
28 screening, and regulatory cleanup levels. The preferred method detection limits are a maximum of  
29 20 percent of the cleanup, screening, or background levels. Analyses conducted with detection  
30 limits that are greater than applicable background, screening, and regulatory cleanup levels shall be  
31 considered data quality exceptions and the reasons for the elevated detection limits shall be  
32 reported to the Department. These data cannot be used for statistical analyses. All analytical data  
33 (non-detects, estimated blanks, and detects) shall be included in the electronic or magnetic copy of  
34 the investigation report in Microsoft™ Excel format with qualifiers as attached from the analytical  
35 laboratory. The summary tables shall include only detects of the data based on the corresponding  
36 qualifiers. The Permittees shall not censor the data based on detection limits, quantitation limits, or  
37 measurement uncertainty.

1 **11.10.3.1 Laboratory QA/QC Requirements**

2 The following requirements for laboratory QA/QC procedures shall be considered the minimum  
3 QA/QC standards for the laboratories employed by the Permittees that provide analytical services  
4 for environmental investigation, corrective action, and monitoring activities conducted at the  
5 Facility. The Permittees shall provide the names of the contract analytical laboratories and copies  
6 of the laboratory quality assurance manuals to the Department within 90 days of awarding a  
7 contract for analytical services to any contract laboratory.

8 **11.10.3.1.i Quality Assurance Procedures**

9 Contract analytical laboratories shall maintain internal quality assurance programs in accordance  
10 with EPA and industry-wide accepted practices and procedures. At a minimum, the laboratories  
11 shall use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike  
12 duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control  
13 samples to demonstrate analytical QA/QC. The laboratories shall establish control limits for  
14 individual chemicals or groups of chemicals based on the long-term performance of the test  
15 methods. In addition, the laboratories shall establish internal QA/QC that meets EPA's laboratory  
16 certification requirements. The specific procedures to be completed are identified in the following  
17 sections.

18 **11.10.3.1.ii Equipment Calibration Procedures and Frequency**

19 The laboratories' equipment calibration procedures, calibration frequency, and calibration  
20 standards shall be in accordance with the EPA test methodology requirements and documented in  
21 the laboratories' quality assurance and SOP manuals. All instruments and equipment used by the  
22 laboratory shall be operated, calibrated, and maintained according to manufacturers' guidelines and  
23 recommendations. Operation, calibration, and maintenance shall be performed by personnel who  
24 have been properly trained in these procedures. A routine schedule and record of instrument  
25 calibration and maintenance shall be kept on file at the laboratory.

26 **11.10.3.1.iii Laboratory QA/QC Samples**

27 Analytical procedures shall be evaluated by analyzing reagent or method blanks, surrogates,  
28 MS/MSDs, BS/BSDs, and laboratory duplicates, as appropriate for each method. The laboratory  
29 QA/QC samples and frequency of analysis to be completed shall be documented in the cited EPA  
30 or DOE test methodologies. At a minimum, the laboratory shall analyze laboratory blanks,  
31 MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs  
32 requiring EPA test methods and at a frequency of one in ten for non-EPA test methods.  
33 Laboratory batch QA/QC samples shall be specific to the project.

34 **11.10.3.1.iv Laboratory Deliverables**

35 The laboratory analytical data package submitted to the Department shall be prepared in  
36 accordance with EPA-established Level II analytical support protocol. The laboratory analytical  
37 data package kept on file at the Facility shall be prepared in accordance with EPA-established  
38 Level III or IV analytical support protocol. The following shall be provided by the contract

- 1 analytical laboratories to the Permittees in the analytical laboratory reports submitted to the  
2 Permittees either electronically, magnetically or in hard (paper) copy for each project:
- 3 1. transmittal letter, including information about the receipt of samples, the testing  
4 methodology performed, any deviations from the required procedures, any problems  
5 encountered in the analysis of the samples, any data quality exceptions, and any  
6 corrective actions taken by the laboratory relative to the quality of the data contained in  
7 the report;
  - 8 2. sample analytical results, including sampling date; date of sample extraction or  
9 preparation; date of sample analysis; dilution factors and test method identification; soil,  
10 rock, or sediment sample results in consistent units (mg/kg) or micrograms per kilogram  
11 in dry-weight basis; water sample results in consistent units (milligrams per liter or  
12 micrograms per liter ( $\mu\text{g/L}$ )); vapor sample results in consistent units (ppm or  $\mu\text{g/m}^3$ ); and  
13 detection limits for undetected analytes. Results shall be reported for all field samples,  
14 including field duplicates and blanks, submitted for analysis;
  - 15 3. method blank results, including detection limits for undetected analytes;
  - 16 4. surrogate recovery results and corresponding control limits for samples and method  
17 blanks (organic analyses only);
  - 18 5. MS/MSD and/or BS/BSD spike concentrations, percent recoveries, relative percent  
19 differences (RPDs), and corresponding control limits;
  - 20 6. laboratory duplicate results for inorganic analyses, including relative percent differences  
21 and corresponding control limits;
  - 22 7. sample chain-of-custody documentation;
  - 23 8. holding times and conditions;
  - 24 9. conformance with required analytical protocol(s);
  - 25 10. instrument calibration;
  - 26 11. blanks;
  - 27 12. detection/quantitation limits;
  - 28 13. recoveries of surrogates;
  - 29 14. variability for duplicate analyses;
  - 30 15. completeness;
  - 31 16. data report formats.

- 1 The following data deliverables for organic compounds shall be required from the laboratory:
- 2 1. a cover letter referencing the procedure used and discussing any analytical problems,  
3 deviations, and modifications, including signature from authority representative  
4 certifying to the quality and authenticity of data as reported;
  - 5 2. report of sample collection, extraction, and analysis dates, including sample holding  
6 conditions;
  - 7 3. tabulated results for samples in units as specified, including data qualification in  
8 conformance with EPA protocol, and definition of data descriptor codes;
  - 9 4. reconstructed ion chromatograms for gas chromatograph/mass spectrometry (GC/MS)  
10 analyses for each sample and standard calibration;
  - 11 5. selected ion chromatograms and mass spectra of detected target analytes (GC/MS) for  
12 each sample and calibration with associated library/reference spectra;
  - 13 6. gas chromatograph/electron capture device (GC/ECD) and/or gas chromatograph/flame  
14 ionization detector (GC/FID) chromatograms for each sample and standard calibration;
  - 15 7. raw data quantification reports for each sample and calibrations, including areas and  
16 retention times for analytes, surrogates, and internal standards;
  - 17 8. a calibration data summary reporting calibration range used and a measure of linearity  
18 [include decafluorotriphenylphosphine (DFTPP) and p-bromofluorobenzene (BFB)  
19 spectra and compliance with tuning criteria for GC/MS];
  - 20 9. final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and  
21 instrument practical detection/quantitation limit for each analyte;
  - 22 10. analyte concentrations with reporting units identified, including data qualification in  
23 conformance with the CLP Statement of Work (SOW) (include definition of data  
24 descriptor codes);
  - 25 11. quantification of analytes in all blank analyses, as well as identification of method blank  
26 associated with each sample;
  - 27 12. recovery assessments and a replicate sample summary, including all surrogate spike  
28 recovery data with spike levels/concentrations for each sample and all MS/MSD results  
29 (recoveries and spike amounts); and
  - 30 13. report of tentatively identified compounds with comparison of mass spectra to  
31 library/reference spectra.
- 32 The following data deliverables for inorganic compounds shall be required from the laboratory:

- 1 1. a cover letter referencing the procedure used and discussing any analytical problems,  
2 deviations, and modifications; including signature from authority representative  
3 certifying to the quality and authenticity of data as reported;
- 4 2. report of sample collection, digestion, and analysis dates, with sample holding conditions;
- 5 3. tabulated results for samples in units as specified, including data qualification in  
6 conformance with the CLP SOW (including definition of data descriptor codes);
- 7 4. results of all method QA/QC checks, including inductively coupled plasma (ICP)  
8 Interference Check Sample and ICP serial dilution results;
- 9 5. tabulation of instrument and method practical detection/quantitation limits;
- 10 6. raw data quantification report for each sample;
- 11 7. a calibration data summary reporting calibration range used and a measure of linearity,  
12 where appropriate;
- 13 8. final digestate volumes (and dilutions required), sample size, and wet-to-dry weight  
14 ratios;
- 15 9. quantification of analytes in all blank analyses, as well as identification of method blank  
16 associated with each sample; and
- 17 10. recovery assessments and a replicate sample summary, including post-digestate spike  
18 analysis; all MS data (including spike concentrations) for each sample, if accomplished;  
19 all MS results (recoveries and spike amounts); and laboratory control sample analytical  
20 results).

21 The Permittees shall present summary tables of these data and Level II QA/QC results to the  
22 Department in the formats described in Permit Section 11.12 (*Reporting Requirements*). The raw  
23 analytical data, including calibration curves, instrument calibration data, data calculation work  
24 sheets, and other laboratory support data for samples from this project, shall be compiled and kept  
25 on file at the Facility for reference. The Permittees shall make the data and all Level III or Level  
26 IV QA/QC data available to the Department upon request.

### 27 **11.10.3.2 Review of Field and Laboratory QA/QC Data**

28 The Permittees shall evaluate the sample data, field, and laboratory QA/QC results for  
29 acceptability with respect to the data quality objectives (DQOs). Each group of samples shall be  
30 compared with the DQOs and evaluated using data validation guidelines contained in EPA  
31 guidance documents, the latest version of SW-846, and industry-accepted QA/QC methods and  
32 procedures.

33 The Permittees shall require the laboratory to notify the Facility project manager of data quality  
34 exceptions within one business day of discovery in order to allow for sample re-analysis, if

1 possible. The Facility project manager shall contact the Department within one business day of  
2 receipt of laboratory notification of data quality exceptions that may affect the ability to meet the  
3 objectives of the investigation or compliance activity in order to discuss the implications and  
4 determine whether the data will still be considered acceptable or if sample re-analysis or  
5 resampling is necessary. The Facility project manager shall summarize the results of the  
6 discussion with the Department project leader regarding the data quality exceptions in a  
7 memorandum. The Permittees shall submit the memorandum to the Department by fax or  
8 electronic mail within three business days of the conclusion of the data quality discussion.

9 **11.10.3.3 Blanks, Field Duplicates, Reporting Limits, and Holding Times**

10 **11.10.3.3.i Blanks**

11 The analytical results of field blanks and field rinsate blanks shall be reviewed to evaluate the  
12 adequacy of the equipment decontamination procedures and the possibility of cross-contamination  
13 caused by decontamination of sampling equipment. The analytical results of trip blanks shall be  
14 reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared  
15 sample containers or the sample transport containers. The analytical results of laboratory blanks  
16 shall be reviewed to evaluate the possibility of contamination caused by the analytical procedures.  
17 If contaminants are detected in field or laboratory blanks, the sample data shall be qualified, as  
18 appropriate.

19 **11.10.3.3.ii Field Duplicates**

20 Field duplicates shall consist of 2 samples either split from the same sample device or collected  
21 sequentially. Field duplicate samples shall be collected at a minimum frequency of 10 percent of  
22 the total number of samples submitted for analysis. RPDs for field duplicates shall be calculated.  
23 A precision of no more than 20 percent for duplicates shall be considered acceptable for soil, rock,  
24 and sediment sampling conducted at the Facility. The analytical DQO for precision shall be used  
25 for water duplicates.

26 **11.10.3.3.iii Method Reporting Limits**

27 Method reporting limits for sample analyses for each medium shall be established at the lowest  
28 level practicable for the method and analyte concentrations and shall not exceed soil, groundwater,  
29 surface water, or vapor emissions background levels, cleanup standards, and screening levels. The  
30 preferred method detection limits are a maximum of 20 percent of the background, screening, or  
31 cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air  
32 emissions cleanup standards, screening levels, or background levels and are reported as “not  
33 detected” shall be considered data quality exceptions and an explanation for the exceedance and its  
34 acceptability for use shall be provided.

35 **11.10.3.3.iv Holding Times**

36 The Permittees shall review the sampling, extraction, and analysis dates to confirm that extraction  
37 and analyses were completed within the recommended holding times, as specified by EPA  
38 protocol. Appropriate data qualifiers shall be noted if holding times were exceeded.

1 **11.10.3.4 Representativeness and Comparability**

2 **11.10.3.4.i Representativeness**

3 Representativeness is a qualitative parameter related to the degree to which the sample data  
4 represent the relevant specific characteristics of the media sampled. The Permittees shall  
5 implement procedures to assure representative samples are collected and analyzed, such as  
6 repeated measurements of the same parameter at the same location over several distinct sampling  
7 events. The Permittees shall note any procedures or variations that may affect the collection or  
8 analysis of representative samples and shall qualify the data.

9 **11.10.3.4.ii Comparability**

10 Comparability is a qualitative parameter related to whether similar sample data can be compared.  
11 To assure comparability, the Permittees shall report analytical results in appropriate units for  
12 comparison with other data (past studies, comparable sites, screening levels, and cleanup  
13 standards), and shall implement standard collection and analytical procedures. Any procedure or  
14 variation that may affect comparability shall be noted and the data shall be qualified.

15 **11.10.3.5 Laboratory Reporting, Documentation, Data Reduction, and Corrective**  
16 **Action**

17 Upon receipt of each laboratory data package, data shall be evaluated against the criteria outlined  
18 in the previous sections. Any deviation from the established criteria shall be noted and the data  
19 will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers  
20 shall be submitted as appendices or attachments to investigation and monitoring reports prepared in  
21 accordance with Permit Section 11.12 (*Reporting Requirements*). Data validation procedures for  
22 all samples shall include checking the following, when appropriate:

- 23 1. holding times;
- 24 2. detection limits;
- 25 3. field equipment rinsate blanks;
- 26 4. field blanks;
- 27 5. field duplicates;
- 28 6. trip blanks;
- 29 7. reagent blanks;
- 30 8. laboratory duplicates;
- 31 9. laboratory blanks;
- 32 10. laboratory matrix spikes;

- 1 11. laboratory matrix spike duplicates;
- 2 12. laboratory blank spikes;
- 3 13. laboratory blank spike duplicates; and
- 4 14. surrogate recoveries.

5 If significant quality assurance problems are encountered, appropriate corrective action shall be  
6 implemented. All corrective action shall be defensible and the corrected data shall be qualified.

#### 7 **11.10.4 Human Health and Ecological Risk Assessments**

8 The Permittees shall prepare a Human Health and Ecological Risk Assessment Report for  
9 determination of clean closure, risk-based closure, and/or in support of corrective action. Risk  
10 assessments shall be conducted in accordance with current and acceptable EPA, Regional EPA,  
11 and Department guidance and methodology.

##### 12 **11.10.4.1 Human Health Risk Assessment Methods**

13 A risk assessment may be required for human receptors that are potentially exposed to site-  
14 related chemicals in environmental media. The risk assessment shall contain a conceptual site  
15 model (CSM), which shall aid in understanding and describing each site. The CSM shall address  
16 the following components:

- 17 1. identification of suspected sources;
- 18 2. identification of contaminants;
- 19 3. identification of contaminant releases;
- 20 4. identification of transport mechanisms;
- 21 5. identification of affected media;
- 22 6. identification of land use scenarios;
- 23 7. identification of potential receptors under current land use scenario;
- 24 8. identification of potential receptors under future land use scenario; and
- 25 9. identification of potential routes of exposure.

26 Potential human receptors under current and/or future land use scenarios may include residential,  
27 industrial, construction, and recreational. Other special receptors may be required on a site-  
28 specific basis.

1 **11.10.4.1.i Exposure Pathways**

2 The identification of exposure pathways shall include of discussion of all potential pathways and  
3 justify whether the pathways are complete. Pathways that shall be considered include soil,  
4 groundwater, air, surface water, sediment, and biota. An evaluation of the potential for  
5 contaminants to migrate from soil to groundwater shall also be provided. The risk assessment  
6 shall also address exposure mechanisms for each exposure pathway, including ingestion,  
7 inhalation, dermal, and inhalation of volatile organic compounds volatilized from soil and/or  
8 groundwater.

9 **11.10.4.1.ii Data Quality Assurance**

10 The risk assessment shall include an evaluation of analytical data and the usability of the data in  
11 the assessment. Data validation shall be conducted in accordance with current EPA guidelines.  
12 The evaluation of data shall also include a comparison of detection limits with appropriate and  
13 current risk-based screening levels. Current EPA methodology for handling non-detects and  
14 replicates in the risk assessment shall be applied.

15 **11.10.4.1.iii Constituents of Potential Concern**

16 Appropriate EPA and/or the Department guidance shall be used to identify constituents of  
17 potential concern (COPCs). With the exception of chemicals attributed to field or laboratory  
18 contamination, all analytes detected in sampled media (i.e., soil, air, surface water, groundwater,  
19 biota, and/or sediment) shall be retained or eliminated as COPCs using one or more of the  
20 following processes:

- 21 1. site attribution analysis;
- 22 2. essential nutrients; and/or
- 23 3. risk-based toxicity screen.

24 Unless sufficient evidence and special circumstances can be provided by the Permittees, all  
25 detected organics not attributable to field or laboratory contamination shall be retained and  
26 treated as site-related chemicals.

27 Inorganics detected in site media shall be compared to an appropriate background data set to  
28 determine if concentrations are present at levels significantly above background. The site  
29 attribution analysis may consist of a tiered approach as follows:

- 30 1. comparison of maximum detected site concentrations to a background reference value  
31 (e.g., upper tolerance limit, UTL);
- 32 2. if the site maximum exceeds the background reference value, and sample size is  
33 sufficient, statistically compare the site data set to the background data set using  
34 appropriate statistical analyses (e.g., Wilcoxon Rank Sum Test);

- 1 3. conduct a graphical analysis of site data and background data (e.g., histograms and/or box  
2 and whisker plots);
- 3 4. conduct a geochemical analysis of site data to a background reference chemical; and/or
- 4 5. evaluate essential nutrients and compare to recommended daily allowances and/or upper  
5 intake limits.

6 All inorganics for which the site attribution analyses indicate are present above natural  
7 background shall be retained as COPCs for the risk assessments.

#### 8 **11.10.4.1.iv Risk-based Toxicity Screen**

9 The Permittees may conduct a risk-based screening assessment to identify the COPCs that are  
10 likely to contribute significantly to risks calculated for each exposure scenario and exposure  
11 medium in order to focus the risk assessment on those chemicals that contribute the greatest  
12 significance to overall risk. The risk-based screening assessment shall consist of the comparison  
13 of the maximum detected site concentration to an appropriate risk-based screening level (e.g.,  
14 New Mexico Soil Screening Levels or EPA Region 6 Soil Screening Levels). Chemicals for  
15 which the maximum detected site concentrations exceed the respective risk-based screening  
16 levels shall be retained for further risk analysis.

#### 17 **11.10.4.1.v Exposure Point Concentrations**

18 The Permittees shall determine exposure point concentrations (EPCs) that are representative of  
19 the concentrations of chemicals in each given medium to which a receptor may be exposed.  
20 EPA recommends a 95% estimate of the upper confidence limit (95% UCL) on the arithmetic  
21 mean be used as an EPC for chronic exposures. For acute exposures, the maximum detected site  
22 concentration shall be used as the EPC.

23 The EPCs shall be determined using statistical analyses that are data distribution and size  
24 dependent. EPA and/or the Department accepted guidance and methodologies shall be used,  
25 such as the ProUCL software.

26 EPCs shall be calculated for soil, groundwater, surface water, sediment, and biota.

27 EPA does not recommend estimating intakes for the air inhalation pathway, but rather compares  
28 estimated volatile/particulate air concentrations adjusted for exposure frequencies, duration, and  
29 time. For inhalation of volatiles/particulates from soil, EPCs shall be determined based upon the  
30 current EPA and/or Department methodology, based upon the volatilization factor or particulate  
31 emission factor. Indoor air concentrations shall be determined using EPA and Department  
32 accepted approaches, such as the EPA-recommended Johnson and Ettinger model.

#### 33 **11.10.4.1.vi Exposure Assumptions**

34 The Permittees shall use EPA and/or Department approved exposure assumptions. Exposure  
35 assumptions may be based upon site-specific data.

1 **11.10.4.1.vii Toxicity Assessment**

2 The Permittees shall use the most recently available toxicity factors to calculate carcinogenic and  
3 noncarcinogenic risks/hazards based upon the currently acceptable hierarchy of sources for  
4 toxicity data. Generally, the approved hierarchy is as follows:

- 5 1. EPA's Integrated Risk Information System (IRIS);
- 6 2. provisional EPA National Center for Environmental Assessment (NCEA);
- 7 3. agency for Toxic Substances and Disease Registry (ASTDR); and
- 8 4. other EPA publications (such as the Health Effects Assessment Summary Tables  
9 (HEAST), Water Quality Criteria, and Health Advisories).

10 The Permittees shall quantitatively estimate the potential for carcinogenic (risk) and non-  
11 carcinogenic (hazard) effects for all chemicals with toxicity data and provide a discussion of  
12 uncertainties associated with the risk assessment. Cumulative effects for risk and hazard shall be  
13 determined.

14 For those chemicals without toxicity data, appropriate surrogate data may be applied. If  
15 surrogate toxicity data are not available, risks/hazards shall be qualitatively addressed in the  
16 uncertainties section of the report.

17 **11.10.4.1.viii Uncertainties**

18 The Permittees shall provide an uncertainties section that discusses all assumptions, professional  
19 judgments, and data which may result in uncertainties in the final estimates of risk and hazard.  
20 The uncertainties shall also discuss whether risks/hazards may have been under or overestimated  
21 due to the assumptions made in the assessment.

22 **11.10.5 Ecological Risk Assessment Methods**

23 An ecological risk assessment may be required for receptors that are potentially exposed to site-  
24 related chemicals in environmental media. The ecological risk assessment process shall consist  
25 of a scoping assessment, a screening-level assessment, and if warranted, a site-specific  
26 assessment. Based upon the results of the scoping assessment, the Permittees shall demonstrate  
27 whether additional analyses are warranted. If the scoping assessment indicates that there is  
28 potential for ecological hazard, a screening-level ecological risk assessment shall be conducted.  
29 Based upon the results of the screening assessment, a site-specific ecological risk assessment  
30 may or may not be necessary.

31 **11.10.5.1 Scoping Assessment**

32 In order to assess whether ecological hazards are a concern at the site, the Permittees shall  
33 conduct a scoping assessment. The Department's "Site Assessment Checklist" and/or other

1 current EPA and/or Department guidance shall be used for conducting the scoping assessment.  
2 The site assessment checklist and/or scoping report shall contain the following information:

- 3 1. scope and intent;
- 4 2. specific site information (including site location and site characterization);
- 5 3. findings of a site investigation (including habitat and exposure pathway evaluation);
- 6 4. identification of ecological receptors of potential concern; and
- 7 5. preliminary conceptual site exposure model (including complete exposure pathways).

8 If the scoping assessment indicates that there are any rare, threatened, endangered or otherwise  
9 protected species using the property, and/or there are any species which are considered a  
10 recreational or a commercial resource, and/or plants or animal species using the affected property  
11 for habitat or foraging and could come into contact with site contaminants, then the Permittees  
12 shall conduct a screening level ecological risk assessment.

#### 13 **11.10.5.2 Screening Level Ecological Risk Assessment**

14 The screening level ecological risk assessment shall be conducted in accordance with current  
15 EPA and/or the Department approved methodologies. The Permittees shall establish  
16 ecologically based screening levels (EBSL) calculated using dietary exposure models and  
17 toxicity reference values (TRVs). The screening level hazard quotient shall be calculated for  
18 each constituent of potential ecological concern (COPEC) in each media using the maximum  
19 detected site concentration and the calculated ecologically-based screening level (EBSL). The  
20 assessment of overall risk shall include cumulative risk if more than one COPEC is present at a  
21 site.

#### 22 **11.10.5.3 Site-Specific Ecological Risk Assessment**

23 If the screening level ecological risk assessment indicates unacceptable risk, then the Permittees  
24 shall conduct a site-specific ecological risk assessment. The assessment shall be conducted using  
25 EPA and/or the Department approved guidance and methodologies. The ecological risk  
26 assessment shall follow the same methodologies outlined above in the human health risk  
27 assessment for determining COPEC and data quality assurance.

#### 28 **11.10.6 Determination of Background**

29 The Permittees shall determine an appropriate background data set for inorganic constituents at  
30 the site. The Permittees shall determine whether one or more background data sets are  
31 appropriate depending on soil types and geology at the site. Background concentrations for  
32 groundwater shall be collected from upgradient wells. The background data set shall be  
33 representative of natural conditions unaffected by site activities and shall be statistically  
34 defensible. A sufficient number of background samples shall be collected for use in the risk  
35 assessment, including conducting site attribution analyses and comparison of data sets.

1 The Permittees shall provide summary statistics for background metals concentrations in each  
2 medium of concern and include the following information:

- 3 1. number of detects;
- 4 2. total number of samples;
- 5 3. frequency of detection;
- 6 4. minimum detected concentration;
- 7 5. maximum detected concentration;
- 8 6. minimum sample quantitation limit (SQL);
- 9 7. maximum SQL;
- 10 8. arithmetic mean;
- 11 9. median;
- 12 10. standard deviation; and
- 13 11. coefficient of variation.

14 The Permittees shall determine the 95% upper tolerance limit (UTL) for each metal using a  
15 distribution-based statistical method.

#### 16 **11.10.6.1 Comparing Site Data to Background**

17 The 95% UTL for each metal shall be used as the background reference value for use in  
18 screening assessments and determining whether metals are present in soil/groundwater/surface  
19 water/sediment due to site activities. The site maximum detected concentration shall be  
20 compared to the 95% UTL for each metal. If the site maximum detected concentration is greater  
21 than the background reference value, then additional site attribution analyses shall be conducted.

22 Site attribution analyses shall be conducted in accordance with current EPA and/or the  
23 Department accepted guidance. The site attribution analyses shall consist of a statistical  
24 comparison of the background data set to the site data set, using distribution based tests such as  
25 the Wilcoxon Rank Sum Test.

26 If the results of the site attribution analyses indicate that the metal is present at the site above  
27 naturally occurring levels, then the Permittees shall include that metal as a site contaminant.

1 **11.11 MONITORING WELL CONSTRUCTION REQUIREMENTS**

2 **11.11.1 Types of Monitoring Wells**

3 Two types of groundwater monitoring wells may be installed at the Facility: single completion  
4 (containing one screened interval) and multiple screened wells. General drilling procedures are  
5 presented in Permit Section 11.11.2 and monitoring well construction requirements are presented  
6 in Permit Section 11.11.3.

7 **11.11.2 Drilling Methods**

8 Groundwater monitoring wells and piezometers must be designed and constructed in a manner  
9 which will yield high quality samples, ensure that the well will last the duration of the project,  
10 and ensure that the well will not serve as a conduit for contaminants to migrate between different  
11 stratigraphic units or aquifers. The design and construction of groundwater monitoring wells  
12 shall comply with the guidelines established in various EPA RCRA guidance, including, but not  
13 limited to:

- 14 1. U.S. EPA, RCRA Groundwater Monitoring: Draft Technical Guidance, EPA/530-R-93-  
15 001, November, 1992;
- 16 2. U.S. EPA, RCRA Groundwater Monitoring Technical Enforcement Guidance Document,  
17 OSWER-9950.1, September, 1986; and
- 18 3. Aller, L., Bennett, T.W., Hackett, G., Petty, R.J., Lehr, J.H., Sedoris, H., Nielsen, D.M.,  
19 and Denne, J.E., Handbook of Suggested Practices for the Design and Installation of  
20 Groundwater Monitoring Wells, EPA 600/4-89/034, 1989.

21 A variety of methods are available for drilling monitoring wells. While the selection of the  
22 drilling procedure is usually based on the site-specific geologic conditions, the following issues  
23 shall also be considered:

- 24 1. drilling shall be performed in a manner that minimizes impacts to the natural properties  
25 of the subsurface materials;
- 26 2. contamination and cross-contamination of groundwater and aquifer materials during  
27 drilling shall be avoided;
- 28 3. the drilling method shall allow for the collection of representative samples of rock,  
29 unconsolidated materials, and soil;
- 30 4. the drilling method shall allow the Permittees to determine when the appropriate location  
31 for the screened interval(s) has been encountered; and
- 32 5. the drilling method shall allow for the proper placement of the filter pack and annular  
33 sealants. The borehole diameter shall be at least 4 inches larger in diameter than the  
34 nominal diameter of the well casing and screen to allow adequate space for placement of  
35 the filter pack and annular sealants.

1 The drilling method shall allow for the collection of representative groundwater samples.  
2 Drilling fluids (which includes air) shall be used only when minimal impact to the surrounding  
3 formation and groundwater can be ensured.

4 A brief description of the different drilling methods that may be appropriate for the construction  
5 of monitoring wells at the Facility follows. Many of these methods may be used alone, or in  
6 combination, to install monitoring wells at the Facility. While the selection of the specific  
7 drilling procedure will usually depend on the site-specific geologic conditions, justification for  
8 the method selected must be provided to the Department.

9 **11.11.2.1 Hollow-Stem Auger**

10 The hollow-stem continuous flight auger consists of a hollow, steel shaft with a continuous,  
11 spiraled steel flight welded onto the exterior site of the stem. The stem is connected to an auger  
12 bit and, when rotated, transports cuttings to the surface. The hollow stem of the auger allows  
13 drill rods, split-spoon core barrels, Shelby tubes, and other samplers to be inserted through the  
14 center of the auger so that samples may be retrieved during the drilling operations. The hollow  
15 stem also acts to temporarily case the borehole, so that the well screen and casing (riser) may be  
16 inserted down through the center of the augers once the desired depth is reached, minimizing the  
17 risk of possible collapse of the borehole. A bottom plug or pilot bit can be fastened onto the  
18 bottom of the augers to keep out most of the soils and/or water that have a tendency to clog the  
19 bottom of the augers during drilling. Drilling without a center plug is acceptable provided that  
20 the soil plug, formed in the bottom of the auger, is removed before sampling or installing well  
21 casings. The soil plug can be removed by washing out the plug using a side discharge rotary bit,  
22 or augering out the plug with a solid-stem auger bit sized to fit inside the hollow-stem auger. In  
23 situations where heaving sands are a problem, potable water may be poured into the augers to  
24 equalize the pressure so that the inflow of formation materials and water shall be held to a  
25 minimum when the bottom plug is removed. The hollow-stem auger method is best suited for  
26 drilling shallow overburden wells.

27 **11.11.2.2 Air Rotary/Air Down-The-Hole Hammer/ODEX**

28 The air rotary method consists of a drill pipe or drill stem coupled to a drill bit that rotates and  
29 cuts through soils and rock. The cuttings produced from the rotation of the drilling bit are  
30 transported to the surface by compressed air, which is forced down the borehole through the drill  
31 pipe and returns to the surface through the annular space (between the drill pipe and the borehole  
32 wall). The circulation of the compressed air not only removes the cuttings from the borehole but  
33 also helps to cool the drill bit. The use of air rotary drilling is best suited for hard-rock  
34 formations. In soft unconsolidated formations, casing is driven to keep the formation from  
35 caving. When using air rotary, the air compressor shall have an in-line filter system to filter the  
36 air coming from the compressor. The filter system shall be inspected regularly to insure that the  
37 system is functioning properly. In addition, a cyclone velocity dissipater or similar air  
38 containment/dust-suppression system shall be used to funnel the cuttings to one location instead  
39 of allowing the cuttings to discharge uncontrolled from the borehole. Air rotary that employs the  
40 dual-tube (reverse circulation) drilling system is acceptable because the cuttings are contained  
41 within the drill stem and are discharged through a cyclone velocity dissipater to the ground  
42 surface.

1 The injection of air into the borehole during air rotary drilling has the potential to alter the  
2 natural properties of the subsurface. This can occur through air-stripping of the VOCs in both  
3 soil and groundwater in the vicinity of the borehole, altering the groundwater geochemical  
4 parameters (e.g., pH and re-dox potential), and potentially increasing biodegradation of organic  
5 compounds in the aquifer near the borehole. These factors may prevent the well from yielding  
6 groundwater samples that are representative of in-situ conditions.

7 In hard, abrasive, consolidated rock, a down-the-hole hammer may be more appropriate than the  
8 air rotary method. In this method, compressed air is used to actuate and operate a pneumatic  
9 hammer as well as lift the cuttings to the surface and cool the hammer bit. One drawback of the  
10 down-the-hole hammer is that oil is required in the air stream to lubricate the hammer-actuating  
11 device, and this oil could potentially contaminate the soil in the vicinity of the borehole and the  
12 aquifer.

13 The ODEX method is a variation of the air rotary method in which a casing-driving technique is  
14 used in combination with air rotary drilling. With the ODEX system, the drill bit extends  
15 outward and reams a pilot hole large enough for a casing assembly to slide down behind the drill  
16 bit assembly. As a result, casing is advanced simultaneously while drilling the hole.

### 17 **11.11.2.3 Water Rotary and Mud Rotary**

18 The water and mud rotary drilling methods consist of rotary drilling techniques where water or  
19 drilling mud is used as the circulating fluid. In both methods, the circulating fluid is pumped  
20 down through the drill pipe and is returned back up the borehole through the annular space. The  
21 circulating fluid stabilizes the borehole, cools the drill bit, and carries the drill cuttings up to the  
22 surface. While the water and mud rotary drilling techniques are rapid and effective drilling  
23 methods, the recognition of water-bearing zones is hampered by the addition of water into the  
24 system.

25 Mud rotary drilling is similar to water rotary drilling with the exception that mud additives are  
26 added to the water to change the properties (e.g., density, viscosity, yield point, gel strength,  
27 fluid-loss-control effectiveness, and lubricity) of the circulating fluid. Drilling muds provide  
28 greater borehole stabilization than water alone. There are several types of mud presently  
29 available, including bentonite, barium sulfate, organic polymers, cellulose polymers, and  
30 polyacrylamides. While drilling muds enhance the stability of the borehole and allow for drilling  
31 in formations not appropriate to other methods, they can adversely affect the hydrologic  
32 properties and geochemistry of the aquifer. For example, drilling fluid invasion and the buildup  
33 of borehole filter cake may reduce the effective porosity of the aquifer in the vicinity of the  
34 borehole. In addition, bentonite drilling muds may affect the pH of groundwater and organic  
35 polymer drilling muds have been observed to facilitate bacterial growth, which reduces the  
36 reliability of sampling results. If polymer emulsions are to be used in the drilling program at the  
37 Facility, polymer dispersion agents shall be used at the completion of the drilling program to  
38 remove the polymers from the boreholes. For example, if EZ Mud® is used as a drilling  
39 additive, a dispersant (e.g., BARAFOS® or five percent sodium hypochlorite) shall be used to  
40 disperse and chemically breakdown the polymer prior to developing and sampling the well. If  
41 drilling fluids are used as part of well installation, the Permittees must demonstrate that all data  
42 acquired from the well is representative of existing subsurface conditions using methods

1 approved by the Department. The Department may require additional sampling and testing  
2 periodically to ensure that the data collected is not affected by residual drilling fluids.

### 3 **11.11.2.4 Dual-Wall Reverse Circulation**

4 The dual-wall reverse circulation drilling method utilizes a double-wall drill pipe and has the  
5 reverse circulation of other conventional rotary drilling methods. The circulating fluid (water or  
6 air) is pumped down the borehole between the outer and inner drill pipe, and returns up the inner  
7 drill pipe. Cuttings are lifted to the surface through the inner drill pipe. The inner drill pipe  
8 rotates the bit, and the outer drill pipe acts as a casing and stabilizes the borehole. Typically, a  
9 tri-cone bit is used when drilling through unconsolidated formations and a down-the-hole  
10 hammer is used in hard rock.

11 The dual-wall reverse circulation rotary method is one of the better methods available for  
12 obtaining representative and continuous formation samples while drilling. If a roller cone bit is  
13 used, the formation that is being drilled is located only a few inches ahead of the double-wall  
14 pipe. As a result, the cuttings observed at the surface represent no more than one foot of the  
15 formation at any point in time.

16 When drilling with air, an in-line filter shall be used to remove oil or other impurities from the  
17 airstream. However, if a down-the-hole hammer is used, it must be used with caution since it  
18 requires oil in the airstream to lubricate the hammer. This could possibly introduce contaminants  
19 to the borehole and aquifer.

### 20 **11.11.2.5 Resonant Sonic**

21 Resonant sonic drilling is a method that uses a sonic drill head to produce high-frequency, high-  
22 force vibrations in a steel drill pipe. The vibrations in the pipe create a cutting action at the bit  
23 face, which allows a continuous core of the formation to move into a core barrel. The method  
24 requires no drilling fluid, drills very fast (up to one ft/sec in certain formations), drills at any  
25 angle through all formations (rock, clay, sand, boulders, permafrost, glacial till), and yields  
26 virtually no cuttings in the drilling process. While there are numerous advantages to this  
27 process, the primary disadvantage is the cost of the method. This drilling method has been  
28 proven and used at various facilities.

### 29 **11.11.2.6 Cryogenic**

30 Cryogenic drilling is a technique that uses standard air rotary drilling methods, but employs cold  
31 nitrogen gas as the circulating fluid instead of compressed air. The use of nitrogen gas as the  
32 circulation fluid freezes the borehole wall while drilling, which stabilizes unconsolidated  
33 sediments and prevents potential cross-contamination of different water-bearing zones. In  
34 addition, the method produces fewer cuttings than liquid based drilling methods, requires  
35 minimal equipment modifications to existing drill rigs, and does not add contaminants to the  
36 borehole during the drilling process due to the benign nature of nitrogen gas. The method is  
37 especially applicable for drilling through alternating hard (competent) and soft (unconsolidated)  
38 formations. This drilling method has been tested by the DOE and proposed for future use at  
39 various DOE facilities.

1 **11.11.3 Well Construction/Completion Methods**

2 **11.11.3.1 Well Construction Materials**

3 Well construction materials shall be selected based on the goals and objectives of the proposed  
4 monitoring program and the geologic conditions at the site. When selecting well construction  
5 materials, the primary concern shall be selecting materials that will not contribute foreign  
6 constituents or remove contaminants from the groundwater. Other factors to be considered  
7 include the tensile strength, compressive strength, and collapse strength of the materials; length  
8 of time the monitoring well will be in service; and the material's resistance to chemical and  
9 microbiological corrosion. Generally, if the monitoring program requires the analysis of organic  
10 constituents, stainless steel or fluoropolymer materials should be used. However, if the  
11 monitoring program requires only inorganic constituent analyses, polyvinyl chloride (PVC)  
12 materials may be used. PVC should not be used for monitoring wells where organic  
13 constituents will be analyzed due to its potential for sorption and leaching of contaminants.

14 Well screen and casing materials acceptable for the construction of RCRA monitoring wells  
15 include stainless steel (304 or 316), rigid PVC (meeting American National Standards  
16 Institute/National Sanitation Foundation Standard 14), and fluoropolymer materials  
17 (polytetrafluoroethylene, fluorinated ethylene propylene, and polyvinylidene). In addition, there  
18 are other materials available for the construction of monitoring wells including acrylonitrile  
19 butadiene styrene (ABS), fiberglass-reinforced plastic (FRP), black iron, carbon steel, and  
20 galvanized steel, but these materials are not recommended for use in long term monitoring wells  
21 due to their low resistance to chemical attack and potential contribution of contamination to the  
22 groundwater. However, these materials may be used in the construction of monitoring wells  
23 where they will not be in contact with the groundwater that will be sampled (e.g., carbon steel  
24 pipe used as surface casing).

25 **11.11.3.2 Well Construction Techniques**

26 **11.11.3.2.i Single-cased Wells**

27 The borehole shall be bored, drilled, or augered as close to vertical as possible, and checked with  
28 a plumb bob, level, or appropriate downhole logging tool. Slanted boreholes shall not be  
29 acceptable unless specified in the design. The borehole shall be of sufficient diameter so that  
30 well construction can proceed without major difficulties. To assure an adequate size, a minimum  
31 two-inch annular space is required between the casing and the borehole wall (or the hollow-stem  
32 auger wall). The two-inch annular space around the casing will allow the filter pack, bentonite  
33 seal, and annular grout to be placed at an acceptable thickness. Also, the two-inch annular space  
34 will allow up to a 1.5-inch outer diameter tremie pipe to be used for placing the filter pack,  
35 bentonite seal, and grout at the specified intervals.

36 It may be necessary to over-drill the borehole so that any soils that have not been removed (or  
37 that have fallen into the borehole during augering or drill stem retrieval) will fall to the bottom of  
38 the borehole below the depth where the filter pack and well screen are to be placed. Normally,  
39 three to five ft is sufficient for over-drilling shallow wells. Deep wells may require deeper over-  
40 drilling. The borehole can also be over-drilled to allow for an extra space for a well sump to be

1 installed. If the borehole is over-drilled deeper than desired, it can be backfilled to the designated  
2 depth with bentonite pellets or the filter pack.

3 The well casings (riser assembly) should be secured to the well screen by flush-jointed threads or  
4 other appropriate connections and placed into the borehole and plumbed by the use of  
5 centralizers, a plumb bob, or a level. No petroleum-based lubricating oils or grease shall be used  
6 on casing threads. Teflon tape can be used to wrap the threads to insure a tight fit and minimize  
7 leakage. No glue of any type shall be used to secure casing joints. Teflon "O" rings can also be  
8 used to ensure a tight fit and minimize leakage. "O" rings made of materials other than Teflon  
9 are not acceptable if the well will be sampled for organic compound analyses. Before the well  
10 screen and casings are placed at the bottom of the borehole, at least six inches of filter material  
11 shall be placed at the bottom to serve as a firm footing. The string of well screen and casing  
12 should then be placed into the borehole and plumbed. If centralizers are used, they shall be  
13 placed below the well screens and above the bentonite annular seals so that the placement of the  
14 filter pack, overlying bentonite seal, and annular grout will not be hindered. Centralizers placed  
15 in the wrong locations can cause bridging during material placement. If installing the well  
16 screen and casings through hollow-stem augers, the augers shall be slowly extracted as the filter  
17 pack, bentonite seal, and grout are tremied or poured into place. The gradual extraction of the  
18 augers will allow the materials being placed in the augers to flow out of the bottom of the augers  
19 into the borehole. If the augers are not gradually extracted, the materials will accumulate at the  
20 bottom of the augers causing potential bridging problems. After the string of well screen and  
21 casing is plumb, the filter material shall be placed around the well screen (preferably by the  
22 tremie pipe method) up to the designated depth. After the filter pack has been installed, the  
23 bentonite seal shall be placed directly on top of the filter pack up to the designated depth or a  
24 minimum of two ft above the filter pack, whichever is greater. After the bentonite seal has  
25 hydrated for the specified time, the annular grout shall be pumped by the tremie method into the  
26 annular space around the casings (riser assembly) up to within two feet of the ground surface or  
27 below the frost line, whichever is greater. The grout shall be allowed to cure for a minimum of  
28 24 hours before the surface pad and protective casing are installed. After the surface pad and  
29 protective casing are installed, bumper guards (guideposts) shall be installed (if necessary).

### 30 **11.11.3.2.ii Double-cased Wells**

31 Double-cased wells should be constructed when there is reason to believe that interconnection of  
32 two aquifers by well construction may cause cross contamination, or when flowing sands make it  
33 impossible to install a monitoring well using conventional methods. A pilot borehole should be  
34 advanced through the overburden and the contaminated zone into a clay, confining layer, or  
35 bedrock. An outer casing (surface or pilot casing) shall be placed into the borehole and sealed  
36 with grout. The borehole and outer casing should extend into tight clay a minimum of two ft or  
37 into competent bedrock a minimum of one foot. The total depth into the clay or bedrock will  
38 vary depending upon the plasticity of the clay and the extent of weathering and fracturing of the  
39 bedrock. The size of the outer casing shall be of sufficient inside diameter to contain the inner  
40 casing and the two-inch annular space. In addition, the borehole shall be of sufficient size to  
41 contain the outer casing and the two-inch minimum outer annular space, if applicable.

42 The outer casing shall be grouted by the tremie method from the bottom of the borehole to within  
43 two ft of the ground surface. The grout shall be pumped into the annular space between the outer

1 casing and the borehole wall. This can be accomplished by either placing the tremie pipe in the  
2 annular space and pumping the grout from the bottom of the borehole to the surface, or placing a  
3 grout shoe or plug inside the casing at the bottom of the borehole and pumping the grout through  
4 the bottom grout plug and up the annular space on the outside of the casing. The grout shall  
5 consist of a Type I Portland cement and bentonite or other approved grout to provide a rigid seal.  
6 A minimum of 24 hours shall be allowed for the grout plug (seal) to cure before attempting to  
7 drill through it. When drilling through the seal, care shall be taken to avoid cracking, shattering,  
8 and washing out of the seal. If caving conditions exist so that the outer casing cannot be  
9 sufficiently sealed by grouting, the outer casing shall be driven into place and a grout seal placed  
10 in the bottom of the casing.

### 11 **11.11.3.2.iii Bedrock Wells**

12 The installation of monitoring wells into bedrock can be accomplished in two ways. The first  
13 method is to drill or bore a pilot borehole through the soil overburden into the bedrock. An outer  
14 casing is installed into the borehole by setting it into the bedrock, and grouting it into place.  
15 After the grout has set, the borehole can be advanced through the grout seal into the bedrock.  
16 The preferred method of advancing the borehole into the bedrock is rock coring. Rock coring  
17 makes a smooth, round hole through the seal and into the bedrock without cracking or shattering  
18 the seal. Roller cone bits are used in soft bedrock, but extreme caution should be taken when  
19 using a roller cone bit to advance through the grout seal in the bottom of the borehole because  
20 excessive water and bit pressure can cause cracking, eroding (washing), and/or shattering of the  
21 seal. Low volume air hammers may be used to advance the borehole, but they have a tendency  
22 to shatter the seal because of the hammering action. If the structural integrity of the grout seal is  
23 in question, a pressure test can be utilized to check for leaks. If the seal leaks, the seal is not  
24 acceptable. When the drilling is complete, the finished well will consist of an open borehole  
25 from the ground surface to the bottom of the well. The major limitation of open borehole  
26 bedrock wells is that the entire bedrock interval serves as the monitoring zone.

27 The second method is to install the outer surface casing and drill the borehole into bedrock, and  
28 then install an inner casing and well screen with the filter pack, bentonite seal, and annular grout.  
29 The well is completed with a surface protective casing and concrete pad. This well installation  
30 method gives the flexibility of isolating the monitoring zone(s) and minimizing inter-aquifer  
31 flow. In addition, it gives structural integrity to the well, especially in unstable areas (e.g.,  
32 steeply dipping shales) where the bedrock has a tendency to shift or move when disturbed.

### 33 **11.11.3.3 Well Screen and Filter Pack Design**

34 Well screens and filter packs shall be designed to accurately sample the aquifer zone that the  
35 well is intended to sample, minimize the passage of formation materials (turbidity) into the well,  
36 and ensure sufficient structural integrity to prevent the collapse of the intake structure. The  
37 selection of the well screen length depends upon the objective of the well. Piezometers and wells  
38 where only a discrete flow path is monitored are generally completed with short screens (two ft  
39 or less). While monitoring wells are usually constructed with longer screens (usually five to ten  
40 ft), they shall be kept to the minimum length appropriate for intercepting a contaminant plume.  
41 The screen slot size shall be selected to retain from 90 to 100 percent of the filter pack material  
42 in artificially filter packed wells, and from 50 to 100 percent of the formation material in  
43 naturally packed wells. All well screens shall be factory wire-wrapped or machine slotted.

1 A filter pack shall be used when: 1) the natural formation is poorly sorted; 2) a long screen  
2 interval is required or the screen spans highly stratified geologic materials of widely varying  
3 grain sizes; 3) the natural formation is uniform fine sand, silt, or clay, 4) the natural formation is  
4 thin-bedded; 5) the natural formation is poorly cemented sandstone; 6) the natural formation is  
5 highly fractured or characterized by relatively large solution channels; 7) the natural formation is  
6 shale or coal that will act as a constant source of turbidity to groundwater samples; or 8) the  
7 diameter of the borehole is significantly greater than the diameter of the screen. The use of  
8 natural formation material as a filter pack is only recommended when the natural formation  
9 materials are relatively coarse-grained, permeable, and uniform in grain size.

10 Filter pack materials shall consist of clean, rounded to well-rounded, hard, insoluble particles of  
11 siliceous composition (industrial grade quartz sand or glass beads). The required grain-size  
12 distribution or particle sizes of the filter pack materials shall be selected based upon a sieve  
13 analysis of the aquifer materials or the formation to be monitored, or the characteristics of the  
14 aquifer materials using information acquired during previous investigations.

15 Where sieve analyses are used to select the appropriate filter pack particle size, the results of a  
16 sieve analysis of the formation materials are plotted on a grain-size distribution graph, and a  
17 grain-size distribution curve is generated. The 70 percent retained grain size value should be  
18 multiplied by a factor between four and six (four for fine, uniform formations and six for coarse,  
19 non-uniform formations). A second grain-size distribution curve is then drawn on the graph for  
20 this new value, ensuring that the uniformity coefficient does not exceed 2.5. The filter pack that  
21 shall be used will fall within the area defined by these two curves.

22 Once the filter pack size is determined, the screen slot size shall be selected to retain at least 90  
23 percent of the filter pack material. The Permittees may propose the use of a pre-determined well  
24 screen slot size and filter pack for monitoring wells in the site-specific work plans submitted to  
25 the Department.

26 The filter pack shall be installed in a manner that prevents bridging and particle-size segregation.  
27 Filter packs placed below the water table shall be installed by the tremie pipe method. Filter  
28 pack materials shall not be poured into the annular space unless the well is shallow (e.g., less  
29 than 30 ft deep) and the filter pack material can be poured continuously into the well without  
30 stopping. At least two inches of filter pack material shall be installed between the well screen  
31 and the borehole wall, and two ft of material shall extend above the top of the well screen. A  
32 minimum of six-inches of filter pack material shall also be placed under the bottom of the well  
33 screen to provide a firm footing and an unrestricted flow under the screened area. In deep wells  
34 (e.g., greater than 200 ft deep), the filter pack may not compress when initially installed. As a  
35 result, filter packs may need to be installed as high as five ft above the screened interval in these  
36 situations. The precise volume of filter pack material required shall be calculated and recorded  
37 before placement, and the actual volume used shall be determined and recorded during well  
38 construction. Any significant discrepancy between the calculated and actual volume shall be  
39 explained. Prior to installing the filter pack annular seal, a one to two-ft layer of chemically inert  
40 fine sand shall be placed over the filter pack to prevent the intrusion of annular sealants into the  
41 filter pack.

42 Several pre-fabricated groundwater sampling systems that can be installed in open boreholes are  
43 available on the market. These include multi-level borehole completion systems (e.g., Westbay

1 MP System<sup>®</sup>) and pneumatically deployed inverting PVC membranes (e.g., SEAMIST). If these  
2 types of borehole completions are to be used in the Facility wells, they shall be installed under  
3 the supervision of personnel from the authorized vendor.

#### 4 **11.11.3.4 Annular Sealant**

5 The annular space between the well casing and the borehole must be properly sealed to prevent  
6 cross-contamination of samples and the groundwater. The materials used for annular sealants  
7 shall be chemically inert with respect to the highest anticipated concentration of chemical  
8 constituents expected in the groundwater at the Facility. In general, the permeability of the  
9 sealing material shall be one to two orders of magnitude lower than the least permeable parts of  
10 the formation in contact with the well. The precise volume of annular sealants required shall be  
11 calculated and recorded before placement, and the actual volume shall be determined and  
12 recorded during well construction. Any significant discrepancy between the calculated volume  
13 and the actual volume shall be explained.

14 During well construction, an annular seal shall be placed on top of the filter pack. This seal shall  
15 consist of a high solids (10-30 percent) bentonite material in the form of bentonite pellets,  
16 granular bentonite, or bentonite chips. The bentonite seal shall be placed in the annulus through  
17 a tremie pipe if the well is deep (greater than 30 ft), or by pouring directly down the annulus in  
18 shallow wells (less than 30 ft). If the bentonite materials are poured directly down the annulus  
19 (which is an acceptable method only in wells less than 30 feet deep), a tamping device shall be  
20 used to ensure that the seal is emplaced at the proper depth and the bentonite has not bridged  
21 higher in the well casing. The bentonite seal shall be placed above the filter pack a minimum of  
22 two ft vertical thickness. The bentonite seal shall be allowed to completely hydrate in  
23 conformance with the manufacturer's specifications prior to installing the overlying annular  
24 grout seal. The time required for the bentonite seal to completely hydrate will differ with the  
25 materials used and the specific conditions encountered, but is generally a minimum of four to 24  
26 hours.

27 A grout seal shall be installed on top of the filter pack annular seal. The grout seal may consist  
28 of a high solids (30 percent) bentonite grout, a neat cement grout, or a cement/bentonite grout.  
29 The grout shall be pumped under pressure (not gravity fed) into the annular space by the tremie  
30 pipe method, from the top of the filter pack annular seal to within a few ft of the ground surface.  
31 The tremie pipe shall be equipped with a side discharge port (or bottom discharge for grouting at  
32 depths greater than 100 feet) to minimize damage to the filter pack or filter pack annular  
33 bentonite seal during grout placement. The grout seal shall be allowed to cure for a minimum of  
34 24 hours before the concrete surface pad is installed. All grouts shall be prepared in accordance  
35 with the manufacturer's specifications. High solids (30 percent) bentonite grouts shall have a  
36 minimum density of 10 pounds per gallon (as measured by a mud balance) to ensure proper  
37 setup. Cement grouts shall be mixed using six and one-half to seven gallons of water per 94-  
38 pound bag of Type I Portland cement. Bentonite (five to ten percent) may be added to delay the  
39 setting time and reduce the shrinkage of the grout.

#### 40 **11.11.4 Well Development**

41 All monitoring wells shall be developed to create an effective filter pack around the well screen,  
42 correct damage to the formation caused by drilling, remove fine particles from the formation

1 near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of  
2 the well. Development stresses the formation around the screen, as well as the filter pack, so that  
3 mobile fines, silts, and clays are pulled into the well and removed. Development is also used to  
4 remove any foreign materials (e.g., water, drilling mud) that may have been introduced into the  
5 borehole during the drilling and well installation activities, and to aid in the equilibration that  
6 will occur between the filter pack, well casing, and the formation water. The development of a  
7 well is extremely important to ensuring the collection of representative groundwater samples.

8 Newly installed monitoring wells shall not be developed for at least 48 hours after the surface  
9 pad and outer protective casing are installed. This will allow sufficient time for the well  
10 materials to cure before the development procedures are initiated. A new monitoring well shall  
11 be developed until the column of water in the well is free of visible sediment, and the pH,  
12 temperature, turbidity, and specific conductivity have stabilized. In most cases, the above  
13 requirements can be satisfied. However, in some cases, the pH, temperature, and specific  
14 conductivity may stabilize but the water remains turbid. In this case, the well may still contain  
15 well construction materials, such as drilling mud in the form of a mud cake or formation soils  
16 that have not been washed out of the borehole. Thick drilling mud cannot be flushed out of a  
17 borehole with one or two well volumes of flushing. Instead, continuous flushing over a period of  
18 several days may be necessary to complete the well development. If the well is pumped dry, the  
19 water level shall be allowed to sufficiently recover before the next development period is  
20 initiated. The common methods used for developing wells include:

- 21 1. pumping and over-pumping;
- 22 2. backwashing;
- 23 3. surging (with a surge block);
- 24 4. bailing;
- 25 5. jetting; and
- 26 6. airlift pumping.

27 These development procedures can be used, either individually or in combination, to achieve the  
28 most effective well development. However, the most favorable well development methods  
29 include pumping, over-pumping, bailing, surging, or a combination of these methods. Well  
30 development methods and equipment that alter the chemical composition of the groundwater  
31 shall not be used. Development methods that involve adding water or other fluids to the well or  
32 borehole, or that use air to accomplish well development should be avoided, if possible.  
33 Approval shall be obtained from the Department prior to introducing air, water, or other fluids  
34 into the well for the purpose of well development. If water is introduced to a borehole during  
35 well drilling and completion, then the same or greater volume of water shall be removed from  
36 the well during development. In addition, the volume of water withdrawn from a well during  
37 development shall be recorded.

1 **11.11.5 Surface Completion**

2 Monitoring wells may be completed either as flush-mounted wells, or as above-ground  
3 completions. A surface seal shall be installed over the grout seal and extended vertically up the  
4 well annulus to the land surface. The lower end of the surface seal shall extend a minimum of 1  
5 foot below the frost line to prevent damage from frost heaving. The composition of the surface  
6 seal shall be neat cement or concrete. In above-ground completions, a three-foot wide, four-inch  
7 thick concrete surface pad shall be installed around the well at the same time the protective  
8 casing is installed. The surface pad shall be sloped so that drainage will flow away from the  
9 protective casing and off the pad. In addition, a minimum of one inch of the finished pad shall  
10 be below grade or ground elevation to prevent washing and undermining by soil erosion.

11 A locking protective casing shall be installed around the well casing (riser) to prevent damage or  
12 unauthorized entry. The protective casing shall be anchored in the concrete surface pad below  
13 the frost line and extend several inches above the well riser stickup. A weep hole shall be drilled  
14 into the protective casing just above the top of the concrete surface pad to prevent water from  
15 accumulating and freezing inside the protective casing around the well riser. A cap shall be  
16 placed on the well riser to prevent tampering or the entry of foreign materials, and a lock shall be  
17 installed on the protective casing to provide security. If the wells are located in an area that  
18 receives traffic, a minimum of three bumper guards consisting of steel pipes three to four inches  
19 in diameter and a minimum of five-foot length should be installed. The bumper guards should  
20 be installed to a minimum depth of two feet below the ground surface in a concrete footing and  
21 extend a minimum of three feet above ground surface. The pipes should be filled with concrete  
22 to provide additional strength. The pipes should be painted a bright color to reduce the  
23 possibility of vehicular damage.

24 If flush-mounted completions are required (e.g., in active roadway areas), a protective structure  
25 such as a utility vault or meter box should be installed around the well casing. In addition,  
26 measures should be taken to prevent the accumulation of surface water in the protective structure  
27 and around the well intake. These measures should include outfitting the protective structure  
28 with a steel lid or manhole cover that has a rubber seal or gasket, and ensuring that the bond  
29 between the cement surface seal and the protective structure is watertight.

30 **11.11.6 Well Abandonment**

31 All well abandonment must be conducted in accordance with 19.27.4 NMAC. Wells are usually  
32 abandoned when they are no longer required in the monitoring network or when they are  
33 damaged beyond repair. The goal of well abandonment is to seal the borehole in such a manner  
34 that the well cannot act as a conduit for migration of contaminants from the ground surface to the  
35 aquifer or between aquifers. To properly abandon a well, the preferred method is to completely  
36 remove the well casing and screen from the borehole, clean out the borehole, and backfill with a  
37 cement or bentonite grout, neat cement, or concrete. The well abandonment procedure must also  
38 comply with current EPA well abandonment guidance.

39 For wells with small diameter casing, abandonment shall be accomplished by overdrilling the  
40 well with a large diameter hollow-stem auger. After the well has been overdrilled, the well  
41 casing and grout can be lifted out of the ground with a drill rig, and the remaining filter pack can  
42 be drilled out. The open borehole can then be pressure grouted (via the tremie pipe method)

1 from the bottom of the borehole to the ground surface. After the grout has cured, the top two ft  
2 of the borehole shall be filled with concrete to insure a secure surface seal.

3 Several other well abandonment procedures are available for wells with larger diameter screens  
4 and casings. One method is to force a drill stem with a tapered wedge assembly or a solid-stem  
5 auger into the well casing and pull the casing out of the ground. However, if the casing breaks or  
6 the well cannot be pulled from the ground, the well will have to be grouted in place. To abandon  
7 a well in place, a tremie pipe shall be placed at the lowest point in the well (at the bottom of the  
8 screen or in the well sump). The entire well is then pressure grouted from the bottom of the well  
9 upward. The pressurized grout will be forced out through the well screen into the filter pack and  
10 up the inside of the well casing sealing off all breaks and holes in the casing. Once the well is  
11 grouted, the casing is cut off even with the ground surface and covered with concrete.

12 If a PVC well cannot be abandoned due to internal casing damage (e.g., the tremie pipe cannot  
13 be extended to the bottom of the screen), it may be necessary to drill out the casing with a roller  
14 cone or drag bit using the wet rotary drilling method, or grind out the casing using a solid-stem  
15 auger equipped with a carbide tooth bit. Once the casing is removed, the open borehole can be  
16 cleaned out and pressure grouted from the bottom of the borehole upward.

#### 17 **11.11.7 Documentation**

18 All information on the design, construction, and development of each monitoring well shall be  
19 recorded and presented on a boring log, a well construction log, and well construction diagram.  
20 The well construction log and well construction diagram shall include the following information:

- 21 1. well name/number;
- 22 2. date/time of well construction;
- 23 3. borehole diameter and well casing diameter;
- 24 4. well depth;
- 25 5. casing length;
- 26 6. casing materials;
- 27 7. casing and screen joint type;
- 28 8. screened interval(s);
- 29 9. screen materials;
- 30 10. screen slot size and design;
- 31 11. filter pack material and size;
- 32 12. filter pack volume (calculated and actual);

- 1 13. filter pack placement method;
- 2 14. filter pack interval(s);
- 3 15. annular sealant composition;
- 4 16. annular sealant placement method;
- 5 17. annular sealant volume (calculated and actual);
- 6 18. annular sealant interval(s);
- 7 19. surface sealant composition;
- 8 20. surface seal placement method;
- 9 21. surface sealant volume (calculated and actual);
- 10 22. surface sealant interval;
- 11 23. surface seal and well apron design and construction;
- 12 24. well development procedure and turbidity measurements;
- 13 25. well development purge volume(s) and stabilization parameter measurements;
- 14 26. type and design and construction of protective casing;
- 15 27. well cap and lock;
- 16 28. ground surface elevation;
- 17 29. survey reference point elevation on well casing;
- 18 30. top of monitoring well casing elevation; and
- 19 31. top of protective steel casing elevation.

## 20 **11.12 REPORTING REQUIREMENTS**

### 21 **11.12.1 General**

22 The purpose of this Section is to provide the reporting requirements and report formats for  
23 corrective action activities at all SWMUs, AOCs, and permitted units required under this Permit.  
24 This Section is not intended to provide reporting requirements for every potential corrective  
25 action conducted at the Facility; therefore, the formats for all types of reports are not presented  
26 below. The described formats include the general reporting requirements and formats for site-  
27 specific investigation work plans, investigation reports, periodic monitoring reports, risk

1 assessment reports, and corrective measures evaluations. The Permittees shall generally consider  
2 the reports to be the equivalents of RCRA Facility Investigation (RFI) work plans, RFI reports,  
3 periodic monitoring reports, risk assessments, Corrective Measures Study (CMS) plans, and  
4 CMS reports, for the purposes of RCRA compliance. The Permittees shall include detailed, site-  
5 specific requirements in all SWMU, AOC, permitted unit and facility-wide investigation work  
6 plans, investigation reports, monitoring reports, and corrective measures evaluations. All plans  
7 and reports shall be prepared with technical and regulatory input from the Department. All work  
8 plans, reports and other documents shall be submitted to the Department in the form of two paper  
9 copies and one copy in electronic or other format acceptable to the Department. The Permittees  
10 shall submit maps and figures in a format specified by the Department (e.g., \*.shp, \*.dwg).

11 The reporting requirements listed in this attachment do not include all sections that may be  
12 necessary to complete each type of report listed and may include sections that are not relevant for  
13 a specific site action. The Permittees or the Department may determine that additional sections  
14 may be needed to address additional site-specific issues or information collected during  
15 corrective action or monitoring activities not listed below. However, the Permittees must submit  
16 variations of the general report format and the formats for reports not listed in this Permit Section  
17 (11.12) in outline form to the Department for approval prior to submittal of the reports. The  
18 Department will approve or disapprove, in writing, the proposed report outline within 90 days of  
19 receipt of the outline. If the Department disapproves the report outline, the Department will  
20 notify the Permittees, in writing, of the outline's deficiencies and will specify a date for submittal  
21 of a revised report outline. All reports submitted by the Permittees shall follow the general  
22 approach and limitations for data presentation described in this attachment.

### 23 **11.12.2 Investigation Work Plan**

24 The Permittees shall prepare work plans for site investigations or corrective action activities at  
25 the Facility using the general outline below. The minimum requirements for describing proposed  
26 activities within each section are included. All research, locations, depths and methods of  
27 exploration, field procedures, analytical results, data collection methods, and schedules shall be  
28 included in each work plan. In general, interpretation of data acquired during previous  
29 investigations shall be presented only in the background sections of the work plans. The other  
30 text sections of the work plans shall be reserved for presentation of anticipated site-specific  
31 activities and procedures relevant to the project. The general work plan outline is described  
32 below.

#### 33 **11.12.2.1 Title Page**

34 The title page shall include the type of document; Facility name; Area designation; SWMU or  
35 AOC name, site, and any other unit name; and the submittal date. A signature block providing  
36 spaces for the names and titles of the responsible DOE and LANS representatives shall be  
37 provided on the title page in accordance with 40 CFR § 270.11(d)(1).

#### 38 **11.12.2.2 Executive Summary (Abstract)**

39 The executive summary or abstract shall provide a brief summary of the purpose and scope of  
40 the investigation to be conducted at the subject site. The Facility, SWMU or AOC name,

1 permitted unit reference, site name, any other unit name, location, and Area designation shall be  
2 included in the executive summary.

### 3 **11.12.2.3 Table of Contents**

4 The table of contents shall list all text sections, tables, figures, and appendices or attachments  
5 included in the work plan. The corresponding page numbers for the titles of each section of the  
6 work plan shall be included in the table of contents.

### 7 **11.12.2.4 Introduction**

8 The introduction shall include the Facility name, area designation, unit location, and unit status  
9 (e.g., closed, corrective action). General information on the current site usage and status shall be  
10 included in this section. A brief description of the purpose of the investigation and the type of  
11 site investigation to be conducted shall be provided in this section.

### 12 **11.12.2.5 Background**

13 The background section shall describe relevant background information. This section shall  
14 briefly summarize historical site uses by the U.S. Government and any other entity, including the  
15 locations of current and former site structures and features. A labeled figure shall be included in  
16 the document showing the locations of current and former site structures and features. The  
17 locations of pertinent subsurface features such as pipelines, underground tanks, utility lines, and  
18 other subsurface structures shall be included in the background summary and labeled on the  
19 figure, unless none exist.

20 This section shall identify potential receptors, including groundwater, and include a brief  
21 summary of the type and characteristics of all waste and all contaminants managed or released at  
22 the site, the known and possible sources of contamination, the history of releases or discharges of  
23 contamination, and the known extent of contamination. This section shall include brief  
24 summaries of results of previous investigations, if conducted, including references to pertinent  
25 figures, data summary tables, and text in previous reports. At a minimum, detections of  
26 contaminants encountered during previous investigations shall be presented in table format, with  
27 an accompanying figure showing sample locations. References to previous reports shall include  
28 page, table, and figure numbers for referenced information. Summary data tables and site plans  
29 showing relevant investigation locations shall be included in the Tables and Figures sections of  
30 the document, respectively.

### 31 **11.12.2.6 Site Conditions**

#### 32 **11.12.2.6.i Surface Conditions**

33 A section on surface conditions shall provide a brief detailed description of current site  
34 topography, features and structures including a description of topographic drainages, man-made  
35 drainages, vegetation, erosional features, and basins. It shall also include a detailed description  
36 of current site usage and any current operations at the site. In addition, descriptions of features  
37 located in surrounding sites that may have an impact on the subject site regarding sediment

1 transport, surface water runoff, or contaminant fate and transport shall be included in this  
2 section.

3 **11.12.2.6.ii Subsurface Conditions**

4 A section on subsurface conditions shall provide a brief, detailed description of the site  
5 conditions observed during previous subsurface investigations, including relevant soil horizons,  
6 stratigraphy, presence of groundwater, and other relevant information. A site plan showing the  
7 locations of all borings and excavations advanced during previous investigations shall be  
8 included in the Figures section of the work plan. A brief description of the anticipated  
9 stratigraphic units that may be encountered during the investigation may be included in this  
10 subsection if no previous investigations have been conducted at the site.

11 **11.12.2.7 Scope of Activities**

12 A section on the scope of activities shall briefly describe a list of all anticipated activities to be  
13 performed during the investigation including background information research, health and safety  
14 requirements that may affect or limit the completion of tasks, drilling, test pit or other  
15 excavations, well construction, field data collection, survey data collection, chemical analytical  
16 testing, aquifer testing, remediation system pilot tests, and IDW storage and disposal.

17 **11.12.2.8 Investigation Methods**

18 A section on investigation methods shall provide a description of all anticipated locations and  
19 methods for conducting the activities to be performed during the investigation. This section shall  
20 include research methods, health and safety practices that may affect the completion of tasks,  
21 drilling methods, test pit or other excavation methods, sampling intervals and methods, well  
22 construction methods, field data collection methods, geophysical and land survey methods, field  
23 screening methods, chemical analytical testing, materials testing, aquifer testing, pilot tests, and  
24 other proposed investigation and testing methods. This information may also be summarized in  
25 table format, if appropriate.

26 **11.12.2.9 Monitoring and Sampling Program**

27 A section on monitoring and sampling shall provide a description of the groundwater, ambient  
28 air, subsurface vapor, remediation system, engineering controls, and other monitoring and  
29 sampling programs currently being implemented at the site.

30 **11.12.2.10 Schedule**

31 A section shall set forth the anticipated schedule for completion of field investigation, pilot  
32 testing, and monitoring and sampling activities. In addition, this section shall set forth a  
33 schedule for submittal of reports and data to the Department including a schedule for submitting  
34 all status reports and preliminary data.

1 **11.12.2.11 Tables**

2 The following summary tables may be included in the investigation work plans, if previous  
3 investigations have been conducted at the site. Data presented in the tables shall include  
4 information on dates of data collection, analytical methods, detection limits, and significant data  
5 quality exceptions. The analytical data tables shall include only detected analytes and data  
6 quality exceptions that could potentially mask detections.

- 7 1. summaries of regulatory criteria, background, and applicable cleanup levels (may be  
8 included in the analytical data tables instead of as separate tables);
- 9 2. summaries of historical field survey location data;
- 10 3. summaries of historical field screening and field parameter measurements of soil, rock,  
11 sediments, groundwater, surface water, and air quality data;
- 12 4. summaries of historical soil, rock, or sediment laboratory analytical data shall include the  
13 analytical methods, detection limits, and significant data quality exceptions that could  
14 influence interpretation of the data;
- 15 5. summaries of historical groundwater elevation and depth to groundwater data. The table  
16 shall include the monitoring well depths, the screened intervals in each well, and the  
17 dates and times measurements were taken;
- 18 6. summaries of historical groundwater laboratory analytical data. The analytical data  
19 tables shall include the analytical methods, detection limits, and significant data quality  
20 exceptions that could influence interpretation of the data;
- 21 7. summary of historical surface water laboratory analytical data. The analytical data tables  
22 shall include the analytical methods, detection limits, and significant data quality  
23 exceptions that could influence interpretation of the data;
- 24 8. summary of historical air sample screening and chemical analytical data. The data tables  
25 shall include the screening instruments used, laboratory analytical methods, detection  
26 limits, and significant data quality exceptions that could influence interpretation of the  
27 data; and
- 28 9. summary of historical pilot or other test data, if applicable, including units of  
29 measurement and types of instruments used to obtain measurements.

30 **11.12.2.12 Figures**

31 The following figures shall be included with each investigation work plan for each site, including  
32 presentation of data where previous investigations have been conducted. All figures must  
33 include an accurate bar scale and a north arrow. An explanation shall be included on each figure  
34 for all abbreviations, symbols, acronyms, and qualifiers. All maps shall contain a date of  
35 preparation.

- 1 1. a vicinity map showing topography and the general location of the site relative to  
2 surrounding features and properties;
- 3 2. a site plan that presents pertinent site features and structures, underground utilities, well  
4 locations, and remediation system locations and details. Off-site well locations and other  
5 relevant features shall be included on the site plan, if appropriate. Additional site plans  
6 may be required to present the locations of relevant off-site well locations, structures, and  
7 features;
- 8 3. figures showing historical and proposed soil boring or excavation locations and sampling  
9 locations;
- 10 4. figures presenting historical soil sample field screening and laboratory analytical data if  
11 applicable;
- 12 5. figures presenting the locations of all existing and proposed borings and vapor  
13 monitoring well locations;
- 14 6. figures showing all existing and proposed wells and piezometers, presenting historical  
15 groundwater elevation data, and indicating groundwater flow directions;
- 16 7. figures presenting historical groundwater laboratory analytical data, if applicable. The  
17 chemical analytical data corresponding to each sampling location can be presented in  
18 tabular form on the figure or as an isoconcentration map;
- 19 8. figures presenting historical and proposed surface water sample locations and field  
20 measurement data, if applicable;
- 21 9. figures presenting historical surface water laboratory analytical data, if applicable;
- 22 10. figures showing historical and proposed air or vapor sampling locations and presenting  
23 historical air quality data, if applicable;
- 24 11. figures presenting historical pilot and other testing locations and data, where applicable,  
25 including site plans and graphic data presentation; and
- 26 12. figures presenting geologic cross-sections, based on outcrop and borehole data acquired  
27 during previous investigations, if applicable.

#### 28 **11.12.2.13 Appendices**

29 A description of IDW management shall be included as an appendix to the investigation work  
30 plan. The results of historical investigations required in this Permit shall be submitted with the  
31 investigation work plan as a separate document. Additional appendices may be necessary to  
32 present additional data or documentation not listed above.

1 **11.12.3 Investigation Report**

2 The Permittees shall prepare investigation reports at the Facility using the general outline below.  
3 The Investigation Report shall be the reporting mechanism for presenting the results of  
4 completed Investigation Work Plans. This Permit Section describes the minimum requirements  
5 for reporting on site investigations. All data collected during each site investigation event in the  
6 reporting period shall be included in the reports. In general, interpretation of data shall be  
7 presented only in the background, conclusions and recommendations sections of the reports. The  
8 other text sections of the reports shall be reserved for presentation of facts and data without  
9 interpretation or qualifications. The general report outline is provided below.

10 **11.12.3.1 Title Page**

11 The title page shall include the type of document; Facility name; Area designation; SWMU or  
12 AOC name, site, and any other unit name; and the submittal date. A signature block providing  
13 spaces for the names and titles of the responsible DOE and LANS representatives shall be  
14 provided on the title page in accordance with 40 CFR § 270.11(d)(1).

15 **11.12.3.2 Executive Summary (Abstract)**

16 The executive summary or abstract shall provide a brief summary of the purpose, scope, and  
17 results of the investigation; site names; location; and area designation. In addition, this section  
18 shall include a brief summary of conclusions included in the report based on the investigation  
19 data collected and recommendations for future investigation, monitoring, remedial action or site  
20 closure.

21 **11.12.3.3 Table of Contents**

22 The table of contents shall list all text sections, subsections, tables, figures, and appendices or  
23 attachments included in the report. The corresponding page numbers for the titles of each  
24 section of the report shall be included in the table of contents.

25 **11.12.3.4 Introduction**

26 The introduction section shall include the Facility name, area designation, unit location, and unit  
27 status (e.g., closed, corrective action). General information on the site usage and status shall be  
28 included in this section. A brief description of the purpose of the investigation, the type of site  
29 investigation conducted, and the type of results presented in the report also shall be provided in  
30 this section.

31 **11.12.3.5 Background**

32 The background section shall describe relevant background information. This section shall  
33 briefly summarize historical site uses by the U.S. Government and any other entity, including the  
34 locations of current and former site structures and features. A labeled figure shall be included in  
35 the document showing the locations of current and former site structures and features. The  
36 locations of any subsurface features such as pipelines, underground tanks, utility lines, and other

1 subsurface structures shall be included in the background summary and labeled on the figure, as  
2 appropriate. In addition, this section shall include a brief summary of the possible sources of  
3 contamination, the history of releases or discharges of contamination, the known extent of  
4 contamination, and a general summary of the results of previous investigations including  
5 references to previous reports. The references to previous reports shall include page, table, and  
6 figure numbers for referenced information. A site plan, showing relevant investigation locations,  
7 and summary data tables shall be included in the Figures and Tables sections of the document,  
8 respectively.

#### 9 **11.12.3.6 Scope of Activities**

10 A section on the scope of activities shall briefly describe all activities performed during the  
11 investigation event including background information research, implemented health and safety  
12 measures that affected or limited the completion of tasks, drilling, test pit or other excavation  
13 methods, well construction methods, field data collection, survey data collection, chemical  
14 analytical testing, aquifer testing, remediation system pilot tests, and IDW storage or disposal.

#### 15 **11.12.3.7 Field Investigation Results**

16 A section shall provide a summary of the procedures used and the results of all field  
17 investigation activities conducted at the site including the dates that investigation activities were  
18 conducted, the type and purpose of field investigation activities performed, field screening  
19 measurements, logging and sampling results, pilot test results, construction details, and  
20 conditions observed. Field observations or conditions that altered the planned work or may have  
21 influenced the results of sampling, testing, and logging shall be reported in this section. The  
22 following sections shall be included.

#### 23 **11.12.3.8 Site Conditions**

##### 24 **11.12.3.8.i Surface Conditions**

25 A section on surface conditions shall provide a brief detailed description of current site  
26 topography, features and structures including a description of topographic drainages, man-made  
27 drainages, vegetation, erosional features, and basins. It shall also include a detailed description  
28 of current site usage and any current operations at the site. In addition, descriptions of features  
29 located in surrounding sites that may have an impact on the subject site regarding sediment  
30 transport, surface water runoff, or contaminant fate and transport shall be included in this  
31 section.

##### 32 **11.12.3.8.ii Subsurface Conditions**

33 A section on subsurface conditions shall provide a brief, detailed description of the site  
34 conditions observed during the subsurface investigations, including relevant soil horizons,  
35 stratigraphy, presence of groundwater, and other relevant information. A site plan showing the  
36 locations of all borings and excavations advanced during the investigation and, as applicable,  
37 previous investigations shall be included in the Figures section of the work plan. A brief

1 description of the stratigraphic units that are encountered during the investigation shall be  
2 included in this subsection if no previous investigations have been conducted at the site.

3 **11.12.3.9 Exploratory Drilling or Excavation Investigations**

4 A section shall describe the locations, methods, and depths of subsurface explorations. The  
5 description shall include the types of equipment used, the logging procedures, the soil or rock  
6 classification system used to describe the observed materials, exploration equipment  
7 decontamination procedures, and conditions encountered that may have affected or limited the  
8 investigation.

9 A description of the site conditions observed during subsurface investigation activities shall be  
10 included in this section, including soil horizon and stratigraphic information. Site plans showing  
11 the locations of all borings and excavations shall be included in the Figures Section of the report.  
12 Boring and test pit logs for all exploratory borings and test pits shall be presented in an appendix  
13 or attachment to the report.

14 **11.12.3.10 Exploratory and Monitoring Well Boring Geophysical Logging**

15 A section shall describe the methods, dates of measurement, depth intervals measured, and the  
16 results of geophysical logging. The relative merits and limitations of each geophysical logging  
17 method employed shall be discussed, along with any field conditions or instrument malfunctions  
18 that occurred that may have affected the results of the geophysical logging.

19 **11.12.3.11 Subsurface Conditions**

20 A section on subsurface conditions shall describe known subsurface lithology and structures,  
21 based on observations made during the current and previous subsurface investigations, including  
22 interpretation of geophysical logs and as-built drawings of man-made structures. A description  
23 of any known locations of pipelines and utility lines and observed geologic structures shall also  
24 be included in this section. A site plan showing boring and excavation locations and the  
25 locations of the site's above- and below-ground structures shall be included in the Figures  
26 Section of the report. In addition, cross-sections shall be constructed, if appropriate, to provide  
27 additional visual presentation of site or regional subsurface conditions.

28 **11.12.3.12 Monitoring Well Construction and Boring or Excavation Abandonment**

29 A section shall describe the methods and details of monitoring well construction and the methods  
30 used to abandon or backfill exploratory borings and excavations. The description shall include  
31 the dates of well construction, boring abandonment, or excavation backfilling. In addition, well  
32 construction diagrams shall be included in an appendix or attachment with the associated boring  
33 logs for monitoring well borings. The Permittees may submit well abandonment reports as an  
34 appendix to the investigation report.

1 **11.12.3.13 Groundwater Conditions**

2 A section shall describe groundwater conditions observed beneath the subject site and relate  
3 local groundwater conditions to regional groundwater conditions. A description of the depths to  
4 water, aquifer thickness, and groundwater flow directions shall be included in this section for  
5 alluvial groundwater, shallow perched groundwater, intermediate perched groundwater, and  
6 regional groundwater, as appropriate to the investigation. Figures showing well locations,  
7 surrounding area, and groundwater elevations and flow directions for each hydrologic zone shall  
8 be included in the Figures Section of the report.

9 **11.12.3.14 Surface Water Conditions**

10 A section shall describe surface water conditions and include a description of surface water  
11 runoff, drainage, surface water sediment transport, and contaminant transport in surface water as  
12 suspended load and as a dissolved phase in surface water via natural and man-made drainages, if  
13 applicable. A description of contaminant fate and transport shall be included, if appropriate.

14 **11.12.3.15 Surface Air and Subsurface Vapor Conditions**

15 A section shall describe surface air and subsurface vapor monitoring and sampling methods used  
16 during the site investigation. It shall also describe observations made during the site  
17 investigation regarding subsurface flow pathways and the subsurface air-flow regime.

18 **11.12.3.16 Materials Testing Results**

19 A section shall discuss the materials testing results, such as core permeability testing, grain size  
20 analysis, or other materials testing results. Sample collection methods, locations, and depths  
21 shall also be included. Corresponding summary tables shall be included in the Tables Section of  
22 the report.

23 **11.12.3.17 Pilot Testing Results**

24 A section shall discuss the results of any pilot tests. Pilot tests are typically conducted after  
25 initial subsurface investigations are completed and the need for additional investigation or  
26 remediation has been evaluated. Pilot tests, including aquifer tests and remediation system pilot  
27 tests, shall be addressed through separate work plans and pilot test reports. The format for pilot  
28 test work plans and reports shall be approved by the Department prior to submittal.

29 **11.12.3.18 Regulatory Criteria**

30 A section shall set forth the cleanup standards, risk-based screening levels, and risk-based  
31 cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for  
32 each site shall be included if site-specific levels have been established at separate Facility sites or  
33 units. A table summarizing the applicable cleanup standards or levels or inclusion of applicable  
34 cleanup standards or levels in the data tables shall be included as part of the document. The risk  
35 assessment, if conducted, shall be presented in a separate document or in an appendix to this  
36 report. If cleanup or screening levels calculated in the Department-approved risk evaluation are

1 employed, the risk evaluation document shall be referenced and shall include pertinent page  
2 numbers for referenced information.

3 **11.12.3.19 Site Contamination**

4 A section shall provide a description of sampling intervals and methods for detection of surface  
5 and subsurface contamination in soils, rock, sediments, groundwater, and surface water, and as  
6 vapor-phase contamination. Only factual information shall be included in this section.  
7 Interpretation of the data shall be reserved for the summary and conclusions sections of the  
8 report. Tables summarizing all sampling, testing, and screening results for detected  
9 contaminants shall be prepared in a format approved by the Department. The tables shall be  
10 presented in the Tables Section of the report.

11 **11.12.3.19.i Soil, Rock, and Sediment Sampling**

12 A section shall describe the sampling of soil, rock, and sediment. It shall include the dates,  
13 locations and methods of sample collection; sampling intervals; sample logging methods;  
14 screening sample selection methods; and laboratory sample selection methods including the  
15 collection depths for samples submitted for laboratory analyses. A site plan showing the sample  
16 locations shall be included in the Figures Section of the report.

17 **11.12.3.19.ii Soil, Rock, and Sediment Sample Field Screening Results**

18 A section shall describe the field screening methods used during the investigation and the field  
19 screening results. Field screening results also shall be presented in summary tables in the Tables  
20 Section of the document. The limitations of field screening instrumentation and any conditions  
21 that influenced the results of field screening shall be discussed in this section.

22 **11.12.3.19.iii Soil, Rock, and Sediment Sampling Analytical Results**

23 A section shall summarize the results of laboratory analysis for soil, rock, and sediment samples.  
24 It shall also describe the analytical methods used and provide a comparison of the analytical  
25 results to background levels, cleanup standards, or established cleanup levels for the site. The  
26 laboratory results also shall be presented in summary tables in the Tables Section of the  
27 document. Field conditions and sample collection methods that could potentially affect the  
28 analytical results shall be described in this section. If appropriate, soil analytical data shall be  
29 presented with sample locations on a site plan and included in the Figures Section of the report.

30 **11.12.3.19.iv Groundwater Sampling**

31 A section on groundwater sampling shall describe the dates, locations, depths, and methods of  
32 sample collection; methods for sample logging; and methods for screening and laboratory sample  
33 selection. A map showing all sites and surrounding area well locations shall be included in the  
34 Figures Section of the report.

1 **11.12.3.19.v Groundwater General Chemistry**

2 A section on the general groundwater chemistry shall describe the results of measurement of  
3 field purging parameters and field analytical measurements. Field parameter measurements and  
4 field analytical results also shall be presented in summary tables in the Tables Section of the  
5 document. The limitations of field measurement instrumentation and any conditions that may  
6 have influenced the results of field screening shall be discussed in this section. As determined  
7 by the Permittees and the Department, relevant water chemistry concentrations shall be presented  
8 as data tables or as iso-concentration contours on a map included in the Figures Section of the  
9 report.

10 **11.12.3.19.vi Groundwater Chemical Analytical Results**

11 A section shall summarize the results of groundwater chemical analyses. It shall describe the  
12 groundwater chemical analytical methods and analytical results. It shall also provide a  
13 comparison of the data to cleanup standards or established cleanup levels for the site. The  
14 rationale or purpose for altering or modifying the groundwater sampling program outlined in the  
15 site investigation work plan shall also be provided in this section. Field conditions shall be  
16 described in this section that may have affected the analytical results during sample collection.  
17 Tables summarizing the groundwater laboratory, field, and field sample QA/QC chemical  
18 analytical data; applicable cleanup levels; and modifications to the groundwater sampling  
19 program shall be provided in the Tables Section of the report. Relevant contaminant  
20 concentrations shall be presented as individual analyte concentrations, data tables, or as  
21 isoconcentration contours on a map included in the Figures Section of the report.

22 **11.12.3.19.vii Surface Water Sampling**

23 A section shall describe the surface water sampling and shall include the dates, times, locations,  
24 depths, and methods of sample collection. It shall also describe methods for sample logging,  
25 sample-screening methods, and laboratory sample selection methods. A map showing all  
26 surface-water sampling locations shall be included in the Figures Section of the report.

27 **11.12.3.19.viii Surface Water General Chemistry**

28 A section on the surface water general chemistry shall describe the results of measurement of  
29 field parameters and field analytical measurements. Field parameter measurements and field  
30 analytical results also shall be presented in summary tables in the Tables Section of the  
31 document. The limitations of field measurement instrumentation and any conditions that  
32 influenced the results of field screening shall be discussed in this Section. Relevant water  
33 chemistry concentrations shall be presented as data tables on a map included in the Figures  
34 Section of the report.

35 **11.12.3.19.ix Surface Water Chemical Analytical Results**

36 A section shall summarize the results of surface water chemical analyses. It shall describe the  
37 analytical methods and analytical results, and provide a comparison of the data to the cleanup  
38 standards or established background or cleanup levels for the site. The rationale or purpose for

1 altering or modifying the surface-water sampling program outlined in the site investigation work  
2 plan also shall be provided in this section. Field conditions that may have affected the analytical  
3 results during sample collection shall be described in this section. Tables summarizing the  
4 surface water laboratory, field, and analytical field sample QA/QC analytical data; applicable  
5 cleanup levels; and modifications to the surface-water sampling program shall be provided in the  
6 Tables Section of the report. Relevant contaminant concentrations shall be presented as  
7 individual analyte concentrations or as data tables on a map included in the Figures Section of  
8 the report.

#### 9 **11.12.3.19.x Air and Subsurface Vapor Sampling**

10 A section shall describe the air and subsurface vapor sampling. It shall describe the dates,  
11 locations, depths or elevations above ground surface, methods of sample collection, methods for  
12 sample logging, and methods for laboratory sample selection. A map showing all air sampling  
13 locations shall be provided in the Figures Section of the report.

#### 14 **11.12.3.19.xi Air and Subsurface Vapor Field Screening Results**

15 A section shall describe the air and subsurface vapor field screening results. It shall describe the  
16 field screening methods used for ambient air and subsurface vapors during the investigation.  
17 Field screening results shall also be presented in summary tables in the Tables Section of the  
18 report. The locations of ambient air and subsurface vapor screening sample collection shall be  
19 presented on a site plan included in the Figures Section of the report. The limitations of field  
20 screening instrumentation and any conditions that influenced the results of field screening shall  
21 be discussed in this Section.

#### 22 **11.12.3.19.xii Air and Subsurface Vapor Laboratory Analytical Results**

23 A section shall describe the results of air and subsurface vapor laboratory analysis. It shall  
24 describe the air sampling laboratory analytical methods and analytical results, and provide a  
25 comparison of the data to emissions standards or established cleanup or emissions levels for the  
26 site. The rationale or purpose for altering or modifying the air monitoring or sampling program  
27 outlined in the site investigation work plan also shall be provided in this section. Field  
28 conditions that may have affected the analytical results during sample collection shall be  
29 described in this section. Tables summarizing the air sample laboratory, field, and analytical  
30 field sample QA/QC data; applicable cleanup levels or emissions standards; and modifications to  
31 the air sampling program shall be provided in the Tables Section of the report. Relevant  
32 contaminant concentrations shall be presented as individual analyte concentrations, data tables,  
33 or as iso-concentration contours on a map included in the Figures Section of the report.

#### 34 **11.12.3.20 Conclusions**

35 A section shall provide a brief summary of the investigation activities and a discussion of the  
36 conclusions of the investigation conducted at the site. In addition, this section shall provide a  
37 comparison of the results to applicable cleanup or screening levels, and to relevant historical  
38 investigation results and analytical data. Potential receptors, including groundwater, shall be  
39 identified and discussed. An explanation shall be provided with regard to data gaps. A risk

1 assessment may be included as an appendix to the investigation report; however, the risk  
2 assessment shall be presented in the Risk Assessment format described in Permit Section  
3 11.12.5. References to the risk assessment shall be presented only in the summary and  
4 conclusions sections of the Investigation Report.

#### 5 **11.12.3.21 Recommendations**

6 A section shall discuss the need for further investigation, corrective measures, risk assessment  
7 and monitoring, or recommendations for corrective action completed, based on the conclusions  
8 provided in the Conclusions section. It shall include explanations regarding additional sampling,  
9 monitoring, and site closure. A corresponding schedule for further action regarding the site shall  
10 also be provided. No action recommendations shall include the anticipated schedule for  
11 submittal of a petition for a permit modification.

#### 12 **11.12.3.22 Tables**

13 A section shall provide the following summary tables as applicable. With prior approval from  
14 the Department, the Permittees may combine one or more of the tables. Data presented in the  
15 tables shall include the current data, dates of data collection, analytical methods, detection limits,  
16 and significant data quality exceptions. The summary analytical data tables shall include only  
17 detected analytes and data quality exceptions that could potentially mask detections.

- 18 1. tables summarizing regulatory criteria, background levels, and applicable cleanup levels  
19 (this information may be included in the analytical data tables instead of as separate  
20 tables);
- 21 2. tables summarizing field survey location data. Separate tables shall be prepared for well  
22 locations and individual medium sampling locations except where the locations are the  
23 same for more than 1 medium;
- 24 3. tables summarizing field screening and field parameter measurements of soil, rock,  
25 sediments, groundwater, surface water, and air quality data;
- 26 4. a table summarizing soil, rock, and/or sediment laboratory analytical data. It shall  
27 include the analytical methods, detection limits, and significant data quality exceptions  
28 that would influence interpretation of the data;
- 29 5. a table summarizing the groundwater elevations and depths to groundwater. The table  
30 shall include the monitoring well depths and the screened intervals in each well;
- 31 6. a table summarizing the groundwater laboratory analytical data. The analytical data  
32 tables shall include the analytical methods, detection limits, and significant data quality  
33 exceptions that would influence interpretation of the data;
- 34 7. a table summarizing the surface water laboratory analytical data. The analytical data  
35 tables shall include the analytical methods, detection limits, and significant data quality  
36 exceptions that would influence interpretation of the data;

- 1 8. a table summarizing the air sample screening and laboratory analytical data. The data  
2 tables shall include the screening instruments used, laboratory analytical methods,  
3 detection limits, and significant data quality exceptions that would influence  
4 interpretation of the data;
- 5 9. tables summarizing the pilot test data, if applicable, including units of measurement and  
6 types of instruments used to obtain measurements; and
- 7 10. a table summarizing any materials test data.

8 **11.12.3.23 Figures**

9 A section shall provide the following figures as applicable. All figures shall include an accurate  
10 bar scale and a north arrow. An explanation shall be provided on each figure for all  
11 abbreviations, symbols, acronyms, and qualifiers. All maps shall have a date.

- 12 1. a vicinity map showing topography and the general location of the subject site relative to  
13 surrounding features and properties;
- 14 2. a site plan that presents any pertinent site features and structures, underground utilities,  
15 well locations, and remediation system location(s) and details. Off-site well locations  
16 and other relevant features shall be included on the site plan. Additional site plans may  
17 be required to present the locations of relevant off-site well locations, structures and  
18 features;
- 19 3. figures showing boring or excavation locations and sampling locations;
- 20 4. figures presenting soil sample field screening and laboratory analytical data;
- 21 5. figures displaying the locations of all newly installed and existing wells and borings;
- 22 6. figures presenting monitoring well and piezometer locations, groundwater elevation data,  
23 and groundwater flow directions;
- 24 7. figures presenting groundwater laboratory analytical data, including any past data  
25 requested by the Department. The laboratory analytical data corresponding to each  
26 sampling location may be presented in table form on the figure or as an isoconcentration  
27 map;
- 28 8. figures presenting surface water sample locations and field measurement data including  
29 any past data requested by the Department;
- 30 9. figures presenting surface water laboratory analytical data including any past data  
31 requested by the Department. The laboratory analytical data corresponding to each  
32 sampling location may be presented in table form on the figure;

- 1 10. figures showing air sampling locations and presenting air quality. The field screening or  
2 laboratory analytical data corresponding to each sampling location may be presented in  
3 table form on the figure or as an isoconcentration map;
- 4 11. figures presenting geologic cross-sections based on outcrop and borehole data; and
- 5 12. figures presenting pilot test locations and data, where applicable, including site plans or  
6 graphic data presentation.

7 **11.12.3.24 Appendices**

8 Each investigation report shall include the following appendices. Additional appendices may be  
9 necessary to present data or documentation not listed below.

10 **11.12.3.24.i Field Methods**

11 An appendix shall provide detailed descriptions of the methods used to acquire field  
12 measurements of each medium that was surveyed or tested during the investigation. This  
13 appendix shall include exploratory drilling or excavation methods, the methods and types of  
14 instruments used to obtain field screening, field analytical or field parameter measurements,  
15 instrument calibration procedures, sampling methods for each medium investigated,  
16 decontamination procedures, sample handling procedures, documentation procedures, and a  
17 description of field conditions that affected procedural or sample testing results. Methods of  
18 measuring and sampling during pilot tests shall be reported in this appendix, if applicable.  
19 Geophysical logging methods shall be discussed in a separate section of this appendix.  
20 Investigation derived waste (IDW) storage and disposal methods shall also be discussed in this  
21 appendix. Copies of IDW disposal documentation shall be provided in a separate appendix.

22 **11.12.3.24.ii Boring/Test Pit Logs and Well Construction Diagrams**

23 An appendix shall provide boring logs, test pit logs, or other excavation logs, and well  
24 construction details. In addition, a key to symbols and a soil or rock classification system shall  
25 be included in this appendix. Geophysical logs shall be provided in a separate section of this  
26 appendix.

27 **11.12.3.24.iii Analytical Program**

28 An appendix shall discuss the analytical methods, a summary of data quality objectives, and the  
29 data quality review procedures. A summary of data quality exceptions and their effect on the  
30 acceptability of the field and laboratory analytical data with regard to the investigation and the  
31 site status shall be included in this appendix along with references to the case narratives provided  
32 in the laboratory reports.

33 **11.12.3.24.iv Analytical Reports**

34 An appendix shall provide the contract laboratory final analytical data reports generated for the  
35 investigation. The reports shall include all chain-of-custody records and Level II QA/QC results

1 provided by the laboratory. The final laboratory reports and data tables shall be provided  
2 electronically in a format approved by the Department. Paper copies (or copies electronically  
3 scanned in PDF format) of all chain-of-custody records shall be provided with the reports.

#### 4 **11.12.3.24.v Other Appendices**

5 Other appendices containing additional information shall be included as required by the  
6 Department or as otherwise appropriate.

#### 7 **11.12.4 Periodic monitoring Report**

8 The Permittees shall use the following guidance for preparing periodic monitoring reports. The  
9 reports shall present the reporting of periodic groundwater, surface water, vapor, and remediation  
10 system monitoring at the Facility. The following sections provide a general outline for  
11 monitoring reports, and also provide the minimum requirements for reporting for specific  
12 Facility sites, areas, and regional monitoring. All data collected during each monitoring and  
13 sampling event in the reporting period shall be included in the reports. In general, interpretation  
14 of data shall be presented only in the background, conclusions, and recommendations sections of  
15 the reports. The other text sections of the reports shall be reserved for presentation of facts and  
16 data without interpretation or qualifications.

##### 17 **11.12.4.1 Title Page**

18 The title page shall include the type of document; Facility name; area designation; SWMU or  
19 AOC name, site, watershed, and any other unit name; and the submittal date. A signature block  
20 providing spaces for the names and titles of the responsible DOE and LANS representatives shall  
21 be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

##### 22 **11.12.4.2 Executive Summary (Abstract)**

23 The executive summary or abstract shall provide a brief summary of the purpose, scope, and  
24 results of the monitoring conducted at the subject site during the reporting period. The area (e.g.,  
25 Plume-front, Facility-wide) SWMU, AOC and site name, location, and/or area designation shall  
26 be included in the executive summary. In addition, this section shall include a brief summary of  
27 conclusions based on the monitoring data collected.

##### 28 **11.12.4.3 Table of Contents**

29 The table of contents shall list all text sections, subsections, tables, figures, and appendices or  
30 attachments included in the report. The corresponding page numbers for the titles of each  
31 section of the report shall be included in the table of contents.

##### 32 **11.12.4.4 Introduction**

33 The introduction section shall include the Facility name, area designation physical area and/or,  
34 unit location, and unit status as applicable (e.g. closed, corrective action). General information  
35 on the site usage and status shall be included in this section. A brief description of the purpose

1 of the monitoring, type of monitoring conducted, and the type of results presented in the report  
2 also shall be provided in this section.

3 **11.12.4.5 Scope of Activities**

4 A section on the scope of activities shall briefly describe all activities performed during the  
5 monitoring event or reporting period including field data collection, analytical testing,  
6 remediation system monitoring, if applicable, and purge/decontamination water storage and  
7 disposal.

8 **11.12.4.6 Regulatory Criteria**

9 A section on regulatory criteria shall provide information regarding applicable cleanup standards,  
10 risk-based screening levels and risk-based cleanup goals for the subject site. A separate table  
11 summarizing the applicable screening levels or standards or inclusion of the applicable cleanup  
12 standards or screening levels in the data tables can be substituted for this section. The  
13 appropriate cleanup or screening levels for each site shall be included, if site-specific levels have  
14 been established at separate sites. Risk-based evaluation procedures, if used to calculate cleanup  
15 or screening levels, must either be included as an attachment or referenced. The specific  
16 document and page numbers must be included for all referenced materials.

17 **11.12.4.7 Monitoring Results**

18 A section shall provide a summary of the results of monitoring conducted at the site. This  
19 section shall include the dates and times that monitoring was conducted, the measured depths to  
20 groundwater, directions of groundwater flow, field air and water quality measurements,  
21 contaminant surveys, static pressures, field measurements, and a comparison to previous  
22 monitoring results. Field observations or conditions that may influence the results of monitoring  
23 shall be reported in this section. Tables summarizing vapor-monitoring parameters, groundwater  
24 elevations, depths to groundwater measurements, and other field measurements can be  
25 substituted for this section. The tables shall include all information required in Permit Section  
26 11.12.4.11.

27 **11.12.4.8 Analytical Data Results**

28 A section shall discuss the results of the chemical analyses. It shall provide the dates of  
29 sampling, the analytical methods, and the analytical results. It shall also provide a comparison of  
30 the data to previous results and to background levels, cleanup standards, or established cleanup  
31 levels for the site. The rationale or purpose for altering or modifying the monitoring and  
32 sampling program shall be provided in this section. A table summarizing the laboratory  
33 analytical data, QA/QC data, applicable cleanup levels, and modifications to the sampling  
34 program can be substituted for this section. The tables shall include all information required in  
35 Permit Section 11.12.4.11.

1 **11.12.4.9 Remediation System Monitoring**

2 A section shall discuss the remediation system monitoring. It shall summarize the remediation  
3 system's capabilities and performance. It shall also provide monitoring data, treatment system  
4 discharge sampling requirements, and system influent and effluent sample analytical results. The  
5 dates of operation, system failures, and modifications made to the remediation system during the  
6 reporting period shall also be included in this section. A summary table may be substituted for  
7 this section. The tables shall include all information required in Permit Section 11.12.4.11.

8 **11.12.4.10 Summary**

9 A summary section shall provide a discussion and conclusions of the monitoring conducted at  
10 the site. In addition, this section shall provide a comparison of the results to applicable cleanup  
11 levels, and to relevant historical monitoring and laboratory analytical data. An explanation shall  
12 be provided with regard to data gaps. A discussion of remediation system performance,  
13 monitoring results, modifications, if applicable, and compliance with discharge requirements  
14 shall be provided in this section. Recommendations and explanations regarding future  
15 monitoring, remedial actions, or site closure, if applicable, shall also be included in this section.

16 **11.12.4.11 Tables**

17 A section shall provide the following summary tables for the media sampled. With prior  
18 approval from the Department, the Permittees may combine one or more of the tables. Data  
19 presented in the tables shall include the current sampling and monitoring data plus data from the  
20 three previous monitoring events or, if data from less than three monitoring events is available,  
21 data acquired during previous investigations. Remediation system monitoring data also shall be  
22 presented. The dates of data collection shall be included in the tables. Summary tables may be  
23 substituted for portions of the text. The analytical data tables shall include only detected analytes  
24 and data quality exceptions that could potentially mask detections.

- 25 1. a table summarizing the regulatory criteria (a Regulatory Criteria text section may be  
26 substituted for this table or the applicable cleanup levels may be included in the analytical  
27 data tables);
- 28 2. a table summarizing groundwater elevations and depths to groundwater data. The table  
29 shall include the monitoring well depths, the screened intervals in each well, and the  
30 dates and times of measurements;
- 31 3. a table summarizing field measurements of surface water quality data;
- 32 4. a table summarizing field measurements of vapor monitoring data (must include  
33 historical vapor monitoring data as described above);
- 34 5. a table summarizing field measurements of groundwater quality data (must include  
35 historical water quality data as described above);

- 1 6. a table summarizing vapor sample analytical data (must include historical vapor sample  
2 analytical data as described above);
- 3 7. a table summarizing surface water analytical data (must include historical surface water  
4 analytical data as described above);
- 5 8. a table summarizing groundwater analytical data (must include historical groundwater  
6 analytical data as described above); and
- 7 9. a table summarizing remediation system monitoring data, if applicable (must include  
8 historical remediation system monitoring data as described above).

#### 9 **11.12.4.12 Figures**

10 The section shall include the following figures. All figures shall include an accurate bar scale  
11 and a north arrow. An explanation shall be provided on each figure for all abbreviations,  
12 symbols, acronyms, and qualifiers. All figures shall have a date.

- 13 1. a vicinity map showing topography and the general location of the subject site relative to  
14 surrounding features or properties;
- 15 2. a site plan that presents pertinent site features and structures, well and piezometer  
16 locations, and remediation system location(s) and features. Off-site well locations and  
17 pertinent features shall be included on the site plan, if practical. Additional site plans  
18 may be required to present the locations of relevant off-site well locations, structures, and  
19 features;
- 20 3. figures presenting the locations of piezometer, monitoring and other well locations,  
21 groundwater elevation data, and groundwater flow directions;
- 22 4. figures presenting groundwater analytical data for the current monitoring event. The  
23 analytical data corresponding to each sampling location may be presented as individual  
24 concentrations or in table form on the figure or as an iso-concentration map;
- 25 5. figures presenting surface water sampling locations and analytical data for the current  
26 monitoring period if applicable;
- 27 6. figures presenting vapor sampling locations and analytical data for the current monitoring  
28 event if applicable. The analytical data corresponding to each sampling location may be  
29 presented as individual concentrations or in table form on the figure or as an iso-  
30 concentration map; and
- 31 7. figures presenting geologic cross-sections based on outcrop and borehole data, if  
32 applicable.

1 **11.12.4.13 Appendices**

2 Each monitoring report shall include the following appendices. Additional appendices may be  
3 necessary to present data or documentation not listed below.

4 **11.12.4.13.i Field Methods**

5 An appendix shall include the methods used to acquire field measurements of groundwater  
6 elevations, vapor and water quality data, and vapor, surface water and groundwater samples. It  
7 shall include the methods and types of instruments used to measure depths to water, air or  
8 headspace parameters, flow measurements, and water quality parameters. In addition,  
9 decontamination, well purging techniques, well sampling techniques, and sample handling  
10 procedures shall be provided in this appendix. Methods of measuring and sampling remediation  
11 systems shall be reported in this appendix, if applicable. Purge and decontamination water  
12 storage and disposal methods shall also be presented in this appendix. Copies of purge and  
13 decontamination water disposal documentation shall be provided in a separate appendix, if  
14 applicable.

15 **11.12.4.13.ii Analytical Program**

16 An appendix shall discuss the analytical program. It shall include the analytical methods, a  
17 summary of data quality objectives, and data quality review procedures. A summary of data  
18 quality exceptions and their effect on the acceptability of the analytical data with regard to the  
19 monitoring event and the site status shall be included in this appendix along with references to  
20 case narratives provided in the laboratory reports.

21 **11.12.4.13.iii Analytical Reports**

22 An appendix shall provide the analytical reports and shall include the contract laboratory final  
23 chemical analytical data reports generated during this reporting period. The reports must include  
24 all chain-of-custody records and Level II QA/QC results provided by the laboratory. The  
25 laboratory final reports and data tables shall be provided electronically in a format approved by  
26 the Department. Paper copies (or electronically scanned in PDF format) of all chain-of-custody  
27 records shall be provided with the reports.

28 **11.12.5 Risk Assessment Report**

29 The Permittees shall prepare risk assessment reports for sites requiring corrective action at the  
30 Facility using the format listed below. This Permit Section (11.12.5) provides a general outline  
31 for risk assessments and also lists the minimum requirements for describing risk assessment  
32 elements. In general, interpretation of data shall be presented only in the Background,  
33 Conceptual Site Model, and Conclusions and Recommendations Sections of the reports. The  
34 other text sections of the Risk Assessment report shall be reserved for presentation of sampling  
35 results from all investigations, conceptual and mathematical elements of the risk assessment, and  
36 presentations of toxicity information and screening values used in the risk assessment. The  
37 general risk assessment outline, applicable to both human health and ecological risk assessments,  
38 is provided below.

1 **11.12.5.1 Title Page**

2 The title page shall include the type of document; Facility name; Area designation; SWMU or  
3 AOC name, site, and any other unit name; and the submittal date. A signature block providing  
4 spaces for the names and titles of the responsible DOE and LANS representatives shall be  
5 provided on the title page in accordance with 40 CFR § 270.11(d)(1).

6 **11.12.5.2 Executive Summary (Abstract)**

7 The executive summary or abstract section shall provide a brief summary of the purpose and  
8 scope of the risk assessment of the subject site. The executive summary shall also briefly  
9 summarize the conclusions of the risk assessment. The Facility, SWMU, AOC, and site names;  
10 location; and Area designation shall be included in the executive summary.

11 **11.12.5.3 Table of Contents**

12 The table of contents shall list all text sections, subsections, tables, figures, and appendices or  
13 attachments included in the risk assessment. The corresponding page numbers for the titles of  
14 each unit of the report shall be included in the table of contents.

15 **11.12.5.4 Introduction**

16 The introduction section shall include the Facility name, area designation, unit location, and unit  
17 status (e.g., closed, corrective action). General information on the current site usage and status  
18 shall be included in this section.

19 **11.12.5.5 Background**

20 The background section shall describe relevant background information. This section shall  
21 briefly summarize historical site uses by the U.S. Government and any other entity, including the  
22 locations of current and former site structures and features. A labeled figure shall be included in  
23 the document showing the locations of current and former site structures and features.

24 **11.12.5.6 Site Description**

25 A section shall describe current site topography, features and structures including topographic  
26 drainages, man-made drainages, erosional features, current site uses, and other data relevant to  
27 assessing risk at the site. Depth to groundwater and direction of groundwater flow shall be  
28 included in this section. The presence and location of surface water bodies such as any springs  
29 or wetlands shall be noted in this section. Photographs of the site may be incorporated into this  
30 section. Ecological features of the site shall be described here, including type and amount of  
31 vegetative cover, observed and expected wildlife receptors, and level of disturbance of the site.  
32 A topographical map of the site and vicinity of the site showing habitat types, boundaries of each  
33 habitat, and any surface water features shall be included in the Figures Section of the document.

1 **11.12.5.7 Sampling Results**

2 A section shall discuss the results of the sampling at the site. It shall include a description of the  
3 history of releases of contaminants, the known and possible sources of contamination, and the  
4 vertical and lateral extent of contamination present in each medium. This section shall include  
5 summaries of sampling results of all investigations including site plans (included in the Figures  
6 Section of the report) showing locations of detected contaminants. This section shall reference  
7 pertinent figures, data summary tables, and references in previous reports. References to  
8 previous reports shall include page, table, and figure numbers for referenced information.  
9 Summaries of sampling data shall include for each constituent: the maximum value detected, the  
10 detection limit, the 95 percent upper confidence level (UCL) of the mean value detected (if  
11 applicable to the data set), and whether the 95 percent UCL of the mean was calculated based on  
12 a normal or lognormal distribution. Background values used for comparison to inorganic  
13 constituents at the site shall be presented here. The table of background values should appear in  
14 the Tables Section of the document and include actual values used as well as the origin of the  
15 values (e.g. Facility-wide, UCL, upper tolerance level (UTL)). This section shall also include a  
16 discussion of how “non-detect” sample results were handled in the averaging of data.

17 **11.12.5.8 Conceptual Site Model**

18 A section shall present the conceptual site model. It shall include information on the expected  
19 fate and transport of contaminants detected at the site. This section shall provide a list of all  
20 sources of contamination at the site. Sources that are no longer considered to be ongoing but  
21 represent the point of origination for contaminants transported to other locations shall be  
22 included. The discussion of fate and transport shall address potential migration of each  
23 contaminant in each medium, potential breakdown products and their migration, and anticipated  
24 pathways of exposure for human or ecological receptors. Diagrammatic representations of the  
25 conceptual site model shall appear in the Figures Section of the document.

26 For human health risk assessments, the conceptual site model shall include the current and  
27 reasonably foreseeable future land use and residential land use for all risk assessments. All  
28 values for exposure parameters and the source of those values shall be included in table format  
29 and presented in the Tables Section of the document.

30 Conceptual site models presented for ecological risk assessments shall identify assessment  
31 endpoints and measurement receptors for the site. The discussion of the model shall explain how  
32 the measurement receptors for the site are protective of the wildlife receptors identified by the  
33 Permittees in the Site Description Section (see Permit Section 7.5.5.a).

34 **11.12.5.9 Risk Screening Levels**

35 A section shall present the actual screening values used for each contaminant for comparison to  
36 all human health and ecological risk screening levels. The Department’s (SSLs for residential  
37 and industrial soil shall be used to screen soil for human health using EPA’s *Risk Assessment  
38 Guidance for Superfund (RAGS), Volume I, Part A, 1989* as updated. For those contaminants not  
39 appearing on the Department’s SSL table, the EPA Region 6 soil screening value adjusted to  
40 meet the Department’s risk goal of  $10^{-5}$  for total risk for carcinogens shall be used to screen the

1 site for human health risks. Screening for ecological risk shall be conducted using U.S. EPA's  
2 ECO-SSLs, or derive a screening level using the methodology in the Department's "*Guidance*  
3 *for Assessing Ecological Risks Posed by Chemicals: Screening –Level Ecological Risk*  
4 *Assessment.*" If no valid toxicological studies exist for a particular receptor or contaminant, the  
5 contaminant/receptor combination shall be addressed using qualitative methods. If a  
6 Department-approved site-specific risk scenario is used for the human health risk assessment,  
7 this section shall include all toxicity information and exposure assessment equations used for the  
8 site-specific scenario as well as the sources for that information. Other regulatory levels  
9 applicable to screening the site, such as drinking water Maximum Contaminant Levels (MCLs),  
10 shall also be included in this section.

#### 11 **11.12.5.10 Risk Assessment Results**

12 A section shall present all risk values, hazard quotients (HQ), and HIs for human health based on  
13 current and reasonably foreseeable future land use. Where the current or reasonably foreseeable  
14 future land use is not residential, risk values, HQs, and HIs for a residential land use scenario  
15 shall also be calculated and reported. The residential scenario shall be used for comparison  
16 purposes only, unless the land use becomes residential. This section shall also present the HQ  
17 and HI for each contaminant for each ecological receptor.

#### 18 **11.12.5.10.i Uncertainty analysis**

19 A section shall include discussion of qualitative, semi-quantitative, and quantitative uncertainty  
20 in the risk assessment and estimate the potential impact of the various uncertainties.

#### 21 **11.12.5.11 Conclusions and Recommendations**

22 A section shall include the interpretation of the results of the risk assessment and any  
23 recommendations for future disposition of the site. This section may include additional  
24 information and considerations that the Permittees believes are relevant to the analysis of the  
25 site.

#### 26 **11.12.5.12 Tables**

27 A section shall provide the following summary tables, as appropriate. With prior approval from  
28 the Department, the Permittees may combine one or more of the tables. Data presented in the  
29 summary tables shall include information on detection limits and significant data quality  
30 exceptions. The analytical data tables shall include only detected analytes and data quality  
31 exceptions that could potentially mask detections.

- 32 1. a table presenting background values used for comparison to inorganic constituents at the  
33 site. The table shall include actual values used as well as the origin of the values  
34 (Facility-wide, UCL, UTL, or maximum);
- 35 2. a table summarizing sampling data shall include, for each constituent, all detected values  
36 above background, the maximum value detected, the 95 percent UCL of the mean value

- 1 detected (if applicable to the data set), and whether that 95 percent UCL of the mean was  
2 calculated based on a normal or lognormal distribution;
- 3 3. a table of all screening values used and the sources of those values.
- 4 4. a table presenting all risk values, HQs, and HIs under current and reasonably foreseeable  
5 future land use for human health;
- 6 5. if residential use is not a current or reasonably foreseeable future land use, a table  
7 presenting all risk values, HQs, and HIs under a residential land use scenario for human  
8 health shall be included for comparison purposes;
- 9 6. a table presenting the HQ and HI for each contaminant for each ecological receptor; and
- 10 7. a table presenting values for exposure parameters and the source of the values.

11 **11.12.5.13 Figures**

12 A section shall present the following figures for each site, as appropriate. With prior approval  
13 from the Department, the Permittees may combine one or more of the figures. All figures shall  
14 include an accurate bar scale and a north arrow. An explanation shall be provided on each figure  
15 for all abbreviations, symbols, acronyms, and qualifiers.

- 16 1. a vicinity map showing topography and the general location of the subject site relative to  
17 surrounding features or properties;
- 18 2. for human health risk assessments, a site plan that presents pertinent site features and  
19 structures, underground utilities, well locations, and remediation system location(s) and  
20 its details. Off-site well locations and other relevant features shall be included on the site  
21 plan if practical. Additional site plans may be required to present the locations of  
22 relevant off-site well locations, structures, and features;
- 23 3. for ecological risk assessments, a topographical map of the site and vicinity of the site  
24 showing habitat types, boundaries of each habitat, and any surface water features; and
- 25 4. conceptual site model diagrams for both human health and ecological risk assessments.

26 **11.12.5.14 Appendices**

27 Each risk assessment report shall include appendices containing supporting data. Appendices  
28 may include the results of statistical analyses of data sets and comparisons of data, full sets of  
29 results of all sampling investigations at the site, or other data as appropriate.

30 **11.12.6 Corrective Measures Evaluation Report**

31 The Permittees shall prepare corrective measures evaluations for sites requiring corrective  
32 measures using the format listed below. This Permit Section (11.12.6) provides a general outline  
33 for corrective measures evaluations and also lists the minimum requirements for describing

1 corrective measures when preparing these documents. All investigation summaries, site  
2 condition descriptions, corrective action goals, corrective action options, remedial options  
3 selection criteria, and schedules shall be included in the corrective measures evaluations. In  
4 general, interpretation of historical investigation data and discussions of prior interim activities  
5 shall be presented only in the background sections of the corrective measures evaluations. At a  
6 minimum, detections of contaminants encountered during previous site investigations shall be  
7 presented in the corrective measures evaluations in table format with an accompanying site plan  
8 showing sample locations. The other text sections of the corrective measures evaluations shall  
9 be reserved for presentation of corrective action-related information regarding anticipated or  
10 potential site-specific corrective action options and methods relevant to the project. The general  
11 corrective measures evaluation outline is provided below.

#### 12 **11.12.6.1 Title Page**

13 The title page shall include the type of document; Facility name; area designation; SWMU or  
14 AOC name, site, and any other unit name; and the submittal date. A signature block providing  
15 spaces for the names and titles of the responsible DOE and LANS representatives shall be  
16 provided on the title page in accordance with 40 CFR § 270.11(d)(1).

#### 17 **11.12.6.2 Executive Summary (Abstract)**

18 This executive summary or abstract shall provide a brief summary of the purpose and scope of  
19 the corrective measures evaluation to be conducted at the subject site. The executive summary  
20 or abstract shall also briefly summarize the conclusions of the evaluation. The SWMU, AOC,  
21 and site names, location, and Area designation shall be included in the executive summary.

#### 22 **11.12.6.3 Table of Contents**

23 The table of contents shall list all text sections, subsections, tables, figures, and appendices or  
24 attachments included in the corrective measures evaluation. The corresponding page numbers  
25 for the titles of each section of the report shall be included in the table of contents.

#### 26 **11.12.6.4 Introduction**

27 The Introduction Section shall include the Facility name, Area designation, site location, and site  
28 status (e.g. closed, corrective action). General information on the current site usage and status  
29 shall be included in this Section. A brief description of the purpose of the corrective measures  
30 evaluation and the corrective action objectives for the project also shall be provided in this  
31 Section.

#### 32 **11.12.6.5 Background**

33 The Background Section shall describe the relevant background information. This Section shall  
34 briefly summarize historical site uses by the U.S. Government and any other entity, including the  
35 locations of current and former site structures and features. A labeled figure shall be included in  
36 the document showing the locations of current and former site structures and features. The

1 locations of any subsurface features such as pipelines, underground tanks, utility lines, and other  
2 subsurface structures shall be included in this Section and labeled on the site plan, as appropriate.

3 This Section shall include contaminant and waste characteristics, a brief summary of the history  
4 of contaminant releases, known and possible sources of contamination, and the vertical and  
5 lateral extent of contamination present in each medium. This Section shall include brief  
6 summaries of results of previous investigations, including references to pertinent figures, data  
7 summary tables, and text in previous reports. References to previous reports shall include page,  
8 table, and figure numbers for referenced information. Summary tables and site plans showing  
9 relevant investigation locations shall be referenced and included in the Tables and Figures  
10 Sections of the document, respectively.

### 11 **11.12.6.6 Site Conditions**

#### 12 **11.12.6.6.i Surface Conditions**

13 A section on surface conditions shall describe current and historic site topography, features, and  
14 structures, including a description of topographic drainages, man-made drainages, vegetation,  
15 and erosional features. It shall also include a description of current uses of the site and any  
16 current operations at the site. This section shall also include a description of those features that  
17 could potentially influence corrective action option selection or implementation such as  
18 archeological sites, wetlands, or other features that may affect remedial activities. In addition,  
19 descriptions of features located in surrounding sites that may have an effect on the subject site  
20 regarding sediment transport, surface water runoff or contaminant transport shall be included in  
21 this section. A site plan displaying the locations of all pertinent surface features and structures  
22 shall be included in the Figures Section of the corrective measures evaluation.

#### 23 **11.12.6.6.ii Subsurface Conditions**

24 A section on subsurface conditions shall describe the site conditions observed during previous  
25 subsurface investigations. It shall include relevant soil horizon and stratigraphic information,  
26 groundwater conditions, fracture data, and subsurface vapor information. A site plan displaying  
27 the locations of all borings and excavations advanced during previous investigations shall be  
28 included in the Figures Section of the corrective measures evaluation. A brief description of the  
29 stratigraphic units anticipated to be present beneath the site may be included in this section if  
30 stratigraphic information is not available from previous investigations conducted at the site.

### 31 **11.12.6.7 Potential Receptors**

#### 32 **11.12.6.7.i Sources**

33 A section shall provide a list of all sources of contamination at the subject site where corrective  
34 measures are to be considered or required. Sources that are no longer considered to be releasing  
35 contaminants at the site, but may be the point of origination for contaminants transported to other  
36 locations, shall be included in this section.

1 **11.12.6.7.ii Pathways**

2 A section shall describe potential migration pathways that could result in either acute or chronic  
3 exposures to contaminants. It shall include such pathways as utility trenches, paleochannels,  
4 surface exposures, surface drainages, stratigraphic units, fractures, structures, and other features.  
5 The migration pathways for each contaminant and each relevant medium should be tied to the  
6 potential receptors for each pathway. A discussion of contaminant characteristics relating to fate  
7 and transport of contaminants through each pathway shall also be included in this section.

8 **11.12.6.7.iii Receptors**

9 A section shall provide a listing and description of all anticipated potential receptors that could  
10 possibly be affected by the contamination present at the site. Potential receptors shall include  
11 human and ecological receptors, groundwater, and other features such as pathways that could  
12 divert or accelerate the transport of contamination to human receptors, ecological receptors, and  
13 groundwater.

14 **11.12.6.8 Regulatory Criteria**

15 A section shall set forth the applicable cleanup standards, risk-based screening levels, and risk-  
16 based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup  
17 levels for each site shall be included, if site-specific levels have been established at separate sites  
18 or units. A table summarizing the applicable cleanup standards or levels, or inclusion of  
19 applicable cleanup standards or levels in the summary data tables shall be included in the Tables  
20 Section of the document. The risk assessment shall be presented in a separate document or in an  
21 appendix to this report. If cleanup or screening levels calculated in a risk evaluation are  
22 employed, the risk evaluation document shall be referenced including pertinent page numbers for  
23 referenced information.

24 **11.12.6.9 Identification of Corrective Measures Options**

25 A section shall identify and describe potential corrective measures for source, pathway, and  
26 receptor controls. Corrective measures options shall include the range of available options  
27 including, but not limited to, a no action alternative, institutional controls, engineering controls,  
28 in-situ and on-site remediation alternatives, complete removal, and any combination of  
29 alternatives that would potentially achieve cleanup goals.

30 **11.12.6.10 Evaluation of Corrective Measures Options**

31 A section shall provide an evaluation of the corrective measures options identified in Permit  
32 Section 11.12.6.9. The evaluation shall be based on the applicability, technical feasibility,  
33 effectiveness, implementability, impacts to human health and the environment, and cost of each  
34 option. A table summarizing the corrective measures alternatives and the criteria listed below  
35 shall be included in the Tables Section of the document. The general basis for evaluation of  
36 corrective measures options is defined below.

1 **11.12.6.10.i Applicability**

2 Applicability addresses the overall suitability for the corrective action option for containment or  
3 remediation of the contaminants in the subject medium for protection of human health and the  
4 environment.

5 **11.12.6.10.ii Technical Practicability**

6 Technical practicability describes the uncertainty in designing, constructing, and operating a  
7 specific remedial alternative. The description shall include an evaluation of historical  
8 applications of the remedial alternative including performance, reliability, and minimization of  
9 hazards.

10 **11.12.6.10.iii Effectiveness**

11 Effectiveness assesses the ability of the corrective measure to mitigate the measured or potential  
12 impact of contamination in a medium under the current and projected site conditions. The  
13 assessment also shall include the anticipated duration for the technology to attain regulatory  
14 compliance. In general, all corrective measures described above will have the ability to mitigate  
15 the impacts of contamination at the site, but not all remedial options will be equally effective at  
16 achieving the desired cleanup goals to the degree and within the same time frame as other  
17 options. Each remedy shall be evaluated for both short-term and long-term effectiveness.

18 **11.12.6.10.iv Implementability**

19 Implementability characterizes the degree of difficulty involved during the installation,  
20 construction, and operation of the corrective measure. Operation and maintenance of the  
21 alternative shall be addressed in this section.

22 **11.12.6.10.v Human Health and Ecological Protectiveness**

23 This category evaluates the short-term (remedy installation-related) and long-term (remedy  
24 operation-related) hazards to human health and the environment of implementing the corrective  
25 measure. The assessment shall include whether the technology will create a hazard or increase  
26 existing hazards and the possible methods of hazard reduction.

27 **11.12.6.10.vi Cost**

28 This section shall discuss the anticipated cost of implementing the corrective measure. The costs  
29 shall be divided into: 1) capital costs associated with construction, installation, pilot testing,  
30 evaluation, permitting, and reporting of the effectiveness of the alternative; and 2) continuing  
31 costs associated with operating, maintaining, monitoring, testing, and reporting on the use and  
32 effectiveness of the technology.

1 **11.12.6.11 Selection of Preferred Corrective Measure**

2 The Permittees shall propose the preferred corrective measure(s) at the site and provide a  
3 justification for the selection in this section. The proposal shall be based upon the ability of the  
4 remedial alternative to: 1) achieve cleanup objectives in a timely manner; 2) protect human and  
5 ecological receptors; 3) control or eliminate the sources of contamination; 4) control migration of  
6 released contaminants; and 5) manage remediation waste in accordance with State and Federal  
7 regulations. The justification shall include the supporting rationale for the remedy selection,  
8 based on the factors listed in Permit Section 11.12.6.10 and a discussion of short- and long-term  
9 objectives for the site. The benefits and possible hazards of each potential corrective measure  
10 alternative shall be included in this section.

11 **11.12.6.12 Design Criteria to Meet Cleanup Objectives**

12 The Permittees shall present descriptions of the preliminary design for the selected corrective  
13 measures in this section. The description shall include appropriate preliminary plans and  
14 specifications to effectively illustrate the technology and the anticipated implementation of the  
15 remedial option at the subject area. The preliminary design shall include a discussion of the  
16 design life of the alternative and provide engineering calculations for proposed remediation  
17 systems.

18 **11.12.6.13 Schedule**

19 A section shall set forth a proposed schedule for completion of remedy-related activities such as  
20 bench tests, pilot tests, construction, installation, remedial excavation, cap construction,  
21 installation of monitoring points, and other remedial actions. The anticipated duration of  
22 corrective action operations and the schedule for conducting monitoring and sampling activities  
23 shall also be presented. In addition, this section shall provide a schedule for submittal of reports  
24 and data to the Department, including a schedule for submitting all status reports and preliminary  
25 data.

26 **11.12.6.14 Tables**

27 A section shall present the following summary tables, as appropriate. With prior approval of the  
28 Department, the Permittees may combine one or more of the tables. Data presented in the  
29 summary tables shall include information on dates of sample collection, analytical methods,  
30 detection limits, and significant data quality exceptions. The analytical data tables shall include  
31 only detected analytes and data quality exceptions that could potentially mask detections.

- 32 1. a table summarizing regulatory criteria, background, and/or the applicable cleanup  
33 standards;
- 34 2. a table summarizing historical field survey location data;
- 35 3. tables summarizing historical field screening and field parameter measurements of soil,  
36 rock, sediments, groundwater, surface water, and air quality data;

- 1 4. tables summarizing historical soil, rock, or sediment laboratory analytical data. The  
2 summary tables shall include the analytical methods, detection limits, and significant data  
3 quality exceptions that would influence interpretation of the data;
- 4 5. a table summarizing historical groundwater elevation and depth to groundwater data.  
5 The table shall include the monitoring well depths and the screened intervals in each  
6 well;
- 7 6. tables summarizing historical groundwater laboratory analytical data. The analytical data  
8 tables shall include the analytical methods, detection limits, and significant data quality  
9 exceptions that would influence interpretation of the data;
- 10 7. tables summarizing historical surface water laboratory analytical data if applicable. The  
11 analytical data tables shall include the analytical methods, detection limits, and  
12 significant data quality exceptions that would influence interpretation of the data;
- 13 8. tables summarizing historical air sample screening and analytical data. The data tables  
14 shall include the screening instruments used, laboratory analytical methods, detection  
15 limits, and significant data quality exceptions that would influence interpretation of the  
16 data;
- 17 9. tables summarizing historical pilot or other test data, if applicable, including units of  
18 measurement and types of instruments used to obtain measurements;
- 19 10. a table summarizing the corrective measures alternatives and evaluation criteria; and
- 20 11. a table presenting the schedule for installation, construction, implementation and  
21 reporting of selected corrective measures.

#### 22 **11.12.6.15 Figures**

23 A section shall present the following figures for each site, as appropriate. All figures must  
24 include an accurate bar scale and a north arrow. An explanation shall be provided on each figure  
25 for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date.

- 26 1. a vicinity map showing topography and the general location of the subject site relative to  
27 surrounding features or properties;
- 28 2. a unit site plan that presents pertinent site features and structures, underground utilities,  
29 well locations, and remediation system locations and details. Off-site well locations and  
30 other relevant features shall be included on the site plan if practical. Additional site plans  
31 may be required to present the locations of relevant off-site well locations, structures, and  
32 features;
- 33 3. figures showing historical soil boring or excavation locations and sampling locations.

- 1 4. figures presenting historical soil sample field screening and laboratory analytical data, if  
2 appropriate;
- 3 5. figures showing all existing wells including vapor monitoring wells and piezometers.  
4 The figures shall present historical groundwater elevation data and indicate groundwater  
5 flow directions;
- 6 6. figures presenting historical groundwater laboratory analytical data including past data, if  
7 applicable. The analytical data corresponding to each sampling location may be  
8 presented as individual concentrations, in table form on the figure or as an iso-  
9 concentration map;
- 10 7. figures presenting historical surface water sample locations and analytical data including  
11 past data, if applicable. The laboratory analytical data corresponding to each sampling  
12 location may be presented as individual concentrations or in table form on the figure;
- 13 8. figures presenting historical air sampling locations and presenting air quality data. The  
14 field screening or laboratory analytical data corresponding to each sampling location may  
15 be presented as individual concentrations, in table form on the figure or as an iso-  
16 concentration map;
- 17 9. figures presenting historical pilot or other test locations and data, where applicable,  
18 including site plans or graphic data presentation;
- 19 10. figures presenting geologic cross-sections based on outcrop and borehole data, if  
20 applicable;
- 21 11. figures presenting the locations of existing and proposed remediation systems;
- 22 12. figures presenting existing remedial system design and construction details; and
- 23 13. figures presenting preliminary design and construction details for preferred corrective  
24 measures.

#### 25 **11.12.6.16 Appendices**

26 Each corrective measures evaluation shall include, as appropriate, as an appendix, the  
27 management plan for waste, including investigation derived waste, generated as a result of  
28 construction, installation, or operation of remedial systems or activities conducted. Each  
29 corrective measures evaluation shall include additional appendices presenting relevant additional  
30 data, such as pilot or other test or investigation data, remediation system design specifications,  
31 system performance data, or cost analyses as necessary.

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1                                   **PART 12: TA-16 SPECIFIC PERMIT REQUIREMENTS**

2   **12.1   GENERAL OPERATING CONDITIONS**

3   The Permittees shall maintain and operate the open-burn units at TA-16 as specified in Permit  
4   Part 6 (*Treatment by Open Burning*), Attachment I (*Open Burn Unit Management*), and this  
5   Permit Part.

6   The Permittees shall ensure that the open-burning of hazardous wastes at TA-16 occurs only in  
7   two areas, the TA-16-388 Flash Pad and the TA-16-399 Burn Tray as designated in Figure 12-1.

8   The Permittees shall ensure that burning operations at TA-16-388 and TA-16-399 do not run  
9   concurrently (40 CFR § 270.32(b)).

10   The Permittees shall ensure that the open burning of hazardous wastes at TA-16 is conducted  
11   using a non-continuous (batch) thermal treatment process (40 CFR § 270.32(b)).

12   The Permittees shall inspect annually and maintain as necessary the surface water run-on/run-off  
13   control features associated with TA-16-388 and TA-16-399, including all associated rock  
14   retention structures and the retaining wall (40 CFR §§ 264.601(b) and 270.32(b)). The  
15   Permittees shall document these inspections in the Facility Operating Record.

16   The Permittees shall conduct an annual soil sampling and analysis program in accordance with  
17   40 CFR § 264.278 and § 264.602. Soil samples shall be collected annually at the open burn unit  
18   each July; the sampling and analysis report must be submitted in accordance with the date  
19   specified in Attachment N (*Compliance Schedule*). Sampling shall occur within 24 hours  
20   following the last treatment event for June of each year at the unit. If no treatment has been  
21   conducted since June of the preceding year, annual sampling may not be conducted for that  
22   annual period. The Department shall be notified, in writing, no later than July 1 of each year  
23   after the effective date of this Permit of the anticipated annual soil sampling date. If treatment  
24   has not been conducted since the previous June, the Permittees shall certify, in writing, that  
25   treatment was not conducted at the unit during the preceding year no later than July 1 of each  
26   year after the effective date of this Permit.

27   Four soil samples shall be collected from the zero to six inch depth and analyzed for total metals,  
28   explosives, and semi-volatile organic compounds. Sample locations shall be within 25 feet of  
29   the OB unit's concrete pad, along its north, south, east, and west sides. If sampling analysis  
30   results indicate hazardous constituents above residential risk soil screening levels, the Permittees  
31   shall follow the sampling and remediation requirements in Permit Sections 9.2.4.7 and 9.2.4.8.

1 **12.2 TA-16-388 FLASH PAD**

2 The Permittees may treat dry or wet bulk high explosives (HE) on the TA-16-388 Flash Pad.

3 The Permittees shall not treat more than 250 lbs bulk HE per event (with a maximum annual  
4 amount of 20,000 lbs) and no less than 100 lbs per event (with a maximum annual amount of 800  
5 lbs) at the Flash Pad (40 CFR § 270.32(b)).

6 The Permittees may treat HE-contaminated waste on the TA-16-388 Flash Pad.

7 The Permittees shall not treat more than 1,000 lbs per event (with a maximum annual amount of  
8 20,000 lbs) and no less than 50 lbs per event (with a maximum annual amount of 600 lbs) of HE-  
9 contaminated waste at the Flash Pad (40 CFR § 270.32(b)).

10 The Permittees shall not treat the following constituents at the Flash Pad:

- 11 1. acrolein;
- 12 2. benzene;
- 13 3. benz(a)pyrene;
- 14 4. chloroform;
- 15 5. total chromium;
- 16 6. crotonaldehyde;
- 17 7. 1,2-dichloroethane;
- 18 8. formaldehyde;
- 19 9. trichloroethylene;
- 20 10. furans; and
- 21 11. zinc

22 (40 CFR § 270.32(b)).

23

24 The Permittees shall ensure solvents or soils treated at the Flash Pad have a minimum of 10%  
25 HE (40 CFR § 270.32(b)).

26 The Permittees shall ensure that no fuel other than propane shall support open burning at the  
27 Flash Pad (40 CFR § 270.32(b)).

28 **12.3 TA-16-399 BURN TRAY**

29 The Permittees shall ensure that the TA-16-399 Burn Tray is used to treat only pure dry HE (40  
30 CFR § 270.32(b)).

31 The Permittees shall not treat more than 1,000 lbs bulk HE per event (with a maximum annual  
32 amount of 20,000 lbs) and no less than 100 lbs per event (with a maximum annual amount of 800  
33 lbs) at the Burn Tray (40 CFR § 270.32(b)).

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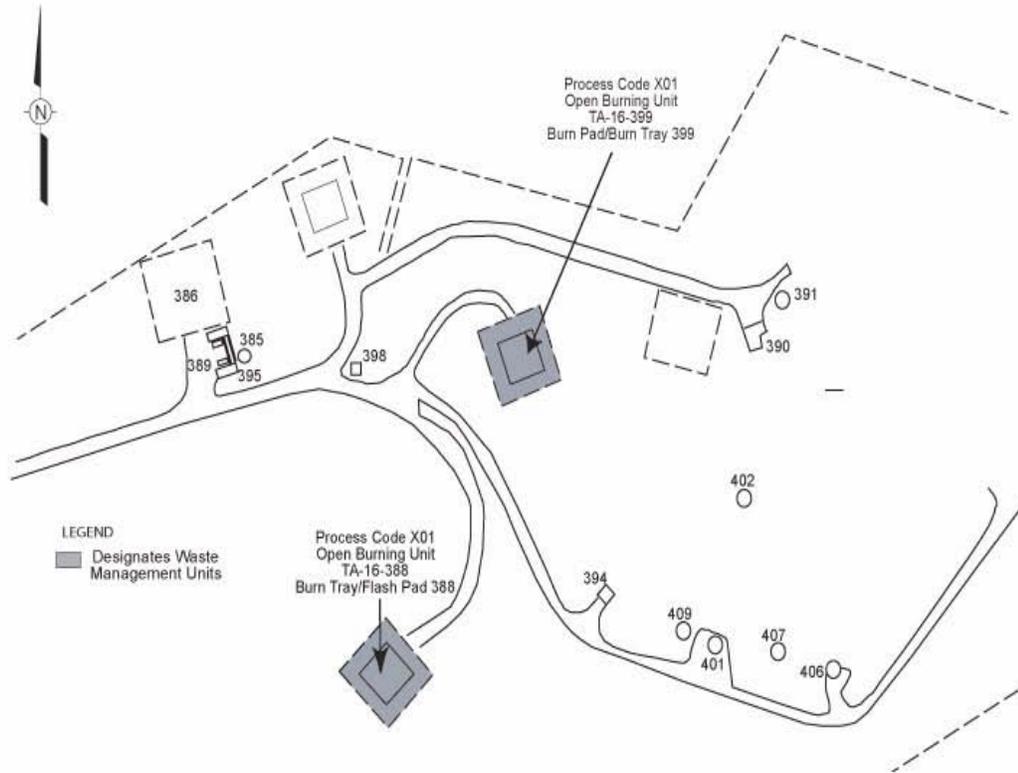


Figure 12-1  
Technical Area (TA) 16 Burn Ground Facility Boundary

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1                                   **PART 13: TA-50 SPECIFIC PERMIT REQUIREMENTS**

2   **13.1   GENERAL OPERATING CONDITIONS**

3   The Permittees shall maintain and operate the container storage units at TA-50 as specified in  
4   Permit Part 3 (*Storage in Containers*), in Attachment G (*Container Management*, TA-50 Section,  
5   Subsection G.2), and this Permit Part.

6   The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at  
7   TA-50 occurs only in two areas: 1) an indoor storage area located in Building 69 (TA-50-69),  
8   Rooms 102 and 103; and 2) an outdoor storage area (TA-50-69, Outdoor) located south/southeast  
9   of Building 69, comprised of an asphalt pad and modular transportainer units.

10   The Permittees shall ensure that ignitable wastes will not be stored inside the glovebox located  
11   within the indoor CSU.

12   The Permittees shall annually inspect and when necessary maintain the drainage swales located  
13   south of the CSU between the CSU and the MDA C, and located on the west side of the CSU  
14   between Pecos Drive and the TA-50 fence line, to ensure that potential run-on is directed away  
15   from the CSUs (40 CFR § 264.175(c)(1)).

16   The Permittees are prohibited from storing hazardous or mixed waste containing free liquids at  
17   TA-50 CSUs.

18   The Permittees shall at all times maintain a fire access lane between the TA-50-69 Outdoor and  
19   Indoor CSUs (40 CFR § 270.32(b)).

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1                                   **PART 14: TA-54 SPECIFIC PERMIT REQUIREMENTS**

2   **14.1   GENERAL OPERATING CONDITIONS**

3   The Permittees shall maintain and operate the container storage units at TA-54 in accordance  
4   with Permit Part 3 (*Storage in Containers*), in accordance with Attachment G (*Container*  
5   *Management*, TA-54 Section), and in accordance with this Permit Part.

6   The Permittees shall ensure that long-term storage of hazardous waste in containers at TA-54  
7   occurs only in the two CSUs at Area L, the nine CSUs at Area G, the two CSUs at TA-54 West,  
8   and as identified in Attachment O (*Hazardous Waste Management Units*).

9   **14.2   AREA G**

10   The Permittees shall ensure that within Area G, Domes 229, 231, and 232, all hazardous waste  
11   containers holding free liquids are stored on secondary containment pallets (40 CFR §  
12   270.32(b)).

13   The Permittees shall plug and abandon the fire protection drain line system between Area G, Pad  
14   9, Domes 229, 231, and 232 (40 CFR § 270.32(b)).

15   The Permittees are prohibited from storing hazardous wastes overnight between domes at Area  
16   G, Pad 9 (40 CFR § 270.32(b)).

17   The Permittees shall remove all fluids from the secondary containment system at Area G, Dome  
18   224 and maintain the system in a dry state (40 CFR § 270.32(b)). The Permittees shall include a  
19   record of the containment system's evacuation in the Facility's Operating Record, including a  
20   complete chemical analysis of the system's fluid contents.

21   The Permittees shall remove all fluids from the secondary containment system at Area G, Dome  
22   230 and maintain the system in a dry state (40 CFR § 270.32(b)). The Permittees shall include a  
23   record of the containment system evacuations in the Facility's Operating Record, including a  
24   complete chemical analysis of the system's contents.

25   The Permittees shall ensure that at Area G, all containers storing hazardous waste with free  
26   liquids are stored on secondary containment pallets, except inside the following structures;  
27   Domes 230, 224, Sheds 144, 145, 146, 177, 1027, 1028, 1029, 1041, and Building TA-54-412  
28   (DVRS).

29   **14.3   AREA L**

30   The Permittees shall consider the Area L, Dome 215, exterior, double-walled, 10,000 gallon,  
31   holding tank and its ancillary piping as a portion of the Dome's secondary containment (40 CFR  
32   § 270.32(b)). The holding tank shall be inspected monthly and any detected fluids shall be  
33   removed immediately. The Permittees shall include a record of all holding tank inspections and

1 evacuations in the Facility's Operating Record, including a complete chemical analysis of the  
2 tank contents (40 CFR § 270.32(b)).

3 The Permittees shall ensure that within Area L, Domes 215 and 216, all hazardous waste  
4 containers holding free liquids are stored on secondary containment pallets.

5 The Permittees shall ensure that at Area L, all containers storing hazardous waste with free  
6 liquids are stored on secondary containment pallets, except when inside the following structures;  
7 Sheds 31, 68, 69, 70, and Buildings TA-54-32, TA-54-35, TA-54-36, TA-54-39 (Room 101 and  
8 South Containment Pad), and TA-54-58.

9 **14.4 TA-54-WEST**

10 The Permittees shall store hazardous waste at TA-54-West only within the boundary of the CSU  
11 as depicted in Figure 14-1.

12 The Permittees shall ensure that containers storing hazardous waste wastes with free liquids are  
13 stored on secondary containment pallets at TA-54-West .

14 The Permittees may store mixed TRU wastes in sealed NRC certified Type-B shipping  
15 containers at the TA-54-West Outdoor CSU without secondary containment and weather  
16 protection.

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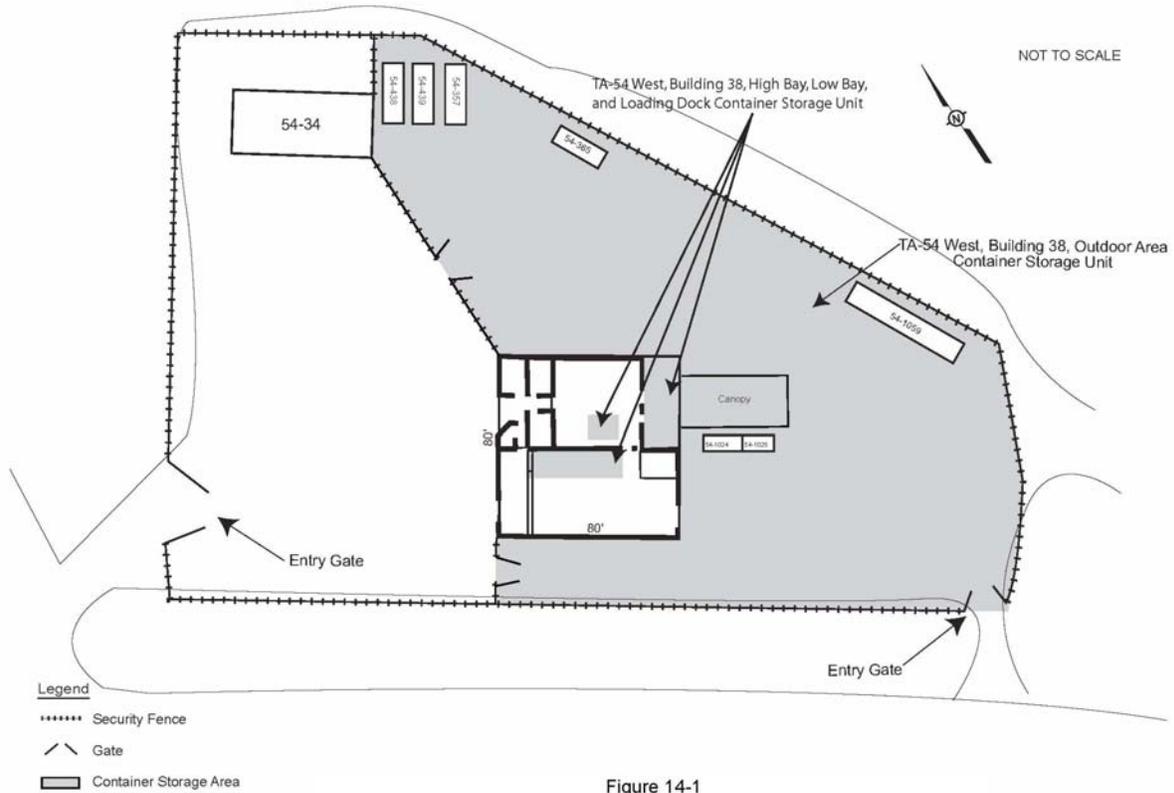


Figure 14-1  
Technical Area (TA) 54 West Facility Boundary

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1                                   **PART 15: TA-55 SPECIFIC PERMIT REQUIREMENTS**

2   **15.1   GENERAL OPERATING CONDITIONS**

3   The Permittees shall maintain and operate the CSUs at TA-55 in accordance with Permit Part 3  
4   (*Storage in Containers*), in accordance with Attachment G (*Container Management*, TA-55  
5   Section), and in accordance with this Permit Part.

6   The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at  
7   TA-55 occurs only in the container storage units (CSUs) B45, B40, B05, K13, the vault located  
8   at TA-55-4, TA-55-185, and the outdoor container storage pad located northwest of TA-55-4.  
9   These units are also the permitted container storage units (CSUs) identified in Attachment O  
10   (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing*  
11   *Hazardous Waste*) with process code S01.

12   The Permittees shall ensure that long-term storage of hazardous or mixed waste in tanks at TA-  
13   55 occurs only in Room 401 at TA-55-4. This unit is also the permitted tank storage unit  
14   identified in Attachment O, (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units*  
15   *Actively Managing Hazardous Waste*) with process code S02.

16   The Permittees shall maintain and operate the tank storage units at TA-55 in accordance with this  
17   Permit Part, in accordance with Permit Part 4 (*Storage in Tanks*), and in accordance with  
18   Attachment H (*Tank Management*).

19   The Permittees shall ensure that treatment by stabilization of hazardous or mixed waste at TA-55  
20   occurs only in Room 401 at TA-55-4. This unit is also the permitted stabilization unit identified  
21   in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively*  
22   *Managing Hazardous Waste*) with process code T04.

23   The Permittees shall maintain and operate the stabilization units at TA-55 in accordance with this  
24   Permit Part, in accordance with Permit Part 5 (*Treatment by Stabilization*), and in accordance  
25   with Attachment J (*Stabilization Unit Management*).

26   **15.2   CONTAINER STORAGE UNIT**

27   The Permittees shall only store hazardous or mixed wastes that do not contain free liquids at  
28   CSUs B05, B45, and TA-55-185.

29   The Permittees shall ensure that at TA-55, all containers storing hazardous or mixed waste with  
30   free liquids are stored on secondary containment pallets, except inside the following CSUs; B40,  
31   K13, and TA-55-4 Vault. Because the floors of CSUs B40, K13, and TA-55-4 Vault are  
32   considered a secondary containment system, and because these floors are not sloped sufficiently  
33   to drain, the Permittees shall ensure that all containers of hazardous or mixed waste in these  
34   CSUs are at all times elevated or otherwise protected from contact with potentially accumulated  
35   liquids (40 CFR § 270.32(b)).

1 The Permittees shall ensure that no more than two 55-gallon drums are stored on self-  
2 containment pallets at TA-55.

3 The Permittees shall ensure that ignitable or reactive wastes are not stored at CSUs B45, B05,  
4 TA-55-185, and the vault located at TA-55-4.

### 5 **15.3 TANK STORAGE UNIT**

6 The Permittees shall only store hazardous or mixed waste in the tank system in Structure TA-55-  
7 4, Room 401, which is comprised of three tank components and consists of a total of 16 tanks  
8 with a maximum storage capacity of 1,020 liters (approximately 266 gallons). The three tank  
9 components shall be referred to as: 1) the evaporator glovebox tank; 2) the cementation unit  
10 pencil tanks (total of five); and 3) the pencil tanks (total of ten).

11 The Permittees shall maintain and operate the tank system as specified in Permit Part 4 (*Storage*  
12 *in Tanks*) and in Attachment H (*Tank Management*), Section H.1.

13 The Permittees shall construct the pencil tank component of the tank system, its piping and  
14 ancillary equipment, and the foundation and tank support as specified at Attachment H, Section  
15 H.1.3.

16 The Permittees shall test and certify the pencil tank component of the tank system as specified in  
17 Attachment H, Section H.2.3.

18 The Permittees shall consider the walls and floor of Room 401 as the secondary containment  
19 system for the tank storage system.

20 The Permittees shall not store ignitable or reactive waste in the tank system at TA-55. The  
21 Permittees shall not commingle incompatible wastes in the tank system at TA-55.

22 The Permittees shall ensure that no hazardous or mixed wastes containing organic concentrations  
23 greater than or equal to 10 percent by weight are contained in or contacted by equipment  
24 associated with the tank system in Room 401. The Permittees shall maintain in the Facility  
25 Operating Record a sufficiently detailed record of wastes entering the system to demonstrate  
26 adherence to this permit condition.

### 27 **15.4 STABILIZATION UNIT**

28 The Permittees shall ensure that the cementation unit includes a pH column, a vacuum trap, two  
29 motor-driven mixers, four impellers, piping and a glovebox. The Permittees shall ensure that the  
30 cementation unit is located in Glovebox GB-454, Room 401, at Structure TA-55-4.

31 The Permittees shall ensure that the cementation unit is maintained and operated as specified in  
32 Permit Part 5 (*Treatment by Stabilization*) and in Attachment J (*Stabilization Unit Management*).

33 The Permittees shall consider the walls and floor of Room 401 as the secondary containment  
34 system for the cementation unit.

- 1 The Permittees shall not manage ignitable or reactive wastes in the cementation unit. The  
2 Permittees shall ensure that incompatible wastes are not combined within the cementation unit.
- 3 The Permittees shall ensure that no hazardous or mixed wastes containing organic concentrations  
4 greater than or equal to ten percent by weight are contained in or contacted by equipment  
5 associated with the cementation unit. The Permittees shall maintain in the Facility Operating  
6 Record a sufficiently detailed record of wastes entering the unit to demonstrate adherence to this  
7 permit condition.
- 8 The Permittees shall ensure that the cementation unit is operated in a manner that prevents  
9 releases to the atmosphere by, in part, maintaining negative pressure inside glovebox GB-454  
10 with the vacuum connected to the TA-55-4 facility ventilation system. The Permittees shall  
11 ensure that if a power failure occurs all operations will cease inside the glovebox unit until power  
12 is restored.

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**PART 16: TA-3 SPECIFIC PERMIT REQUIREMENTS**

**16.1 GENERAL OPERATING CONDITIONS**

The Permittees shall maintain and operate the CSUs at TA-55 in accordance with Permit Part 3 (*Storage in Containers*), in accordance with Attachment G (*Container Management*), TA-3 Section, and in accordance with this Permit Part.

The Permittees shall ensure that long-term storage of hazardous or mixed waste in containers at TA-3 occurs only in the container storage units in Rooms 9010, 9020, and 9030 identified in Attachment O (*Hazardous Waste Management Units*), Table O-1 (*Permitted Units Actively Managing Hazardous Waste*).

**16.2 CONTAINER STORAGE UNIT**

The Permittees shall ensure that at TA-3, all containers storing hazardous waste with free liquids are stored on secondary containment pallets. Because the floors of CSUs in Rooms 9010, 9020, and 9030 are not sloped sufficiently to drain, the Permittees shall ensure that all containers of hazardous waste in these CSUs are at all times elevated or otherwise protected from contact with potentially accumulated liquids.

The Permittees shall ensure that no more than two 55-gallon drums are stored on self-containment pallets at TA-3.

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