

**ATTACHMENT J**  
**POST-CLOSURE PLAN**

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**TABLE OF CONTENTS**

Introduction .....	<a href="#">J-1</a>
J-1 <u>Post-Closure Plan</u> .....	<a href="#">J-1</a>
J-1a <u>Post-Closure Plan after Final Facility Closure</u> .....	<a href="#">J-2</a>
J-1a(1) <u>Active Institutional Controls</u> .....	<a href="#">J-3</a>
J-1a(2) <u>Monitoring</u> .....	<a href="#">J-5</a>
J-2 <u>Notices Required for Disposal Facilities</u> .....	<a href="#">J-5</a>
J-2a <u>Post-Closure Certification</u> .....	<a href="#">J-5</a>
J-2b <u>Post-Closure Notices</u> .....	<a href="#">J-5</a>

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## ATTACHMENT J

### POST-CLOSURE PLAN

#### 1 Introduction

2 This Permit Attachment contains the Post-Closure Plan, which describes activities required to  
3 maintain the Waste Isolation Pilot Plant (**WIPP**) after completion of facility closure. Since the  
4 current plans for operations extend over several decades, the Permittees will periodically  
5 reapply for an operating permit in accordance with Title 20 of the New Mexico Administrative  
6 Code, Chapter 4, Part 1 (**20.4.1 NMAC**), Subpart 900 (incorporating 40 CFR §270.10(h)).

7 This plan was submitted to the New Mexico Environment Department (**NMED**) in accordance  
8 with 20.4.1.900 NMAC (incorporating 40 CFR §270.14(b)(13)) and the U.S. Environmental  
9 Protection Agency (**EPA**). The Post-Closure Plan includes the implementation of institutional  
10 controls to limit access and groundwater monitoring to assess disposal system performance.  
11 Until final closure is complete and has been certified in accordance with 20.4.1.500 NMAC  
12 (incorporating 40 CFR §264.115), a copy of the approved Post-Closure Plan and all approved  
13 revisions will be on file at the WIPP facility and will be available to the Secretary of the NMED or  
14 the EPA Region VI Administrator upon request.

#### 15 J-1 Post-Closure Plan

16 The post-closure care period begins after completion of closure of the first underground  
17 hazardous waste disposal unit (**HWDU**) and continues for thirty (30) years after final closure of  
18 the facility. The post-closure care period may be shortened or lengthened by the Secretary of  
19 the NMED, based on evidence that human health and the environment are being protected or  
20 are at risk. During the post-closure period, the WIPP shall be maintained in a manner that  
21 complies with the environmental performance standards applicable to the facility. During this  
22 period, the Permittees will employ active institutional controls as necessary.

23 This post-closure plan focuses on activities following final facility closure. However, some  
24 discussion of post-closure following panel closure is warranted since some panel closures will  
25 occur long before final facility closure. As discussed in Attachment I (Closure Plan), Section I-  
26 1e(1), panel closures have been designed to require no post-closure maintenance. The  
27 Permittees have defined a post-closure care program for closed panels that has three aspects.  
28 These are routine inspection of the openings in the vicinity of the closures, the sampling of  
29 ventilation air for harmful constituents, and a Volatile Organic Compound Monitoring Program.  
30 The rules of the Mine Safety Health Administration drive the implementation of the first two  
31 programs. These rules require that underground mines monitor air quality to assure good  
32 breathing air whenever personnel are underground and that mine operators provide safe ground  
33 conditions for personnel in areas that require access. Routine monitoring of the openings in the  
34 access ways to panels will be continued and these openings will be maintained for as long as  
35 access into them is needed. This includes continued reading of installed geomechanical  
36 instrumentation, sounding the areas, visual inspection and maintenance activities such as  
37 scaling, mining, or bolting as required and as described in Permit Attachment M2. In addition, all

1 areas in the underground that are occupied by personnel are checked prior to each day's work  
2 activities for accumulations of harmful gases, including methane. Action levels for increasing  
3 ventilation to areas that show high levels of harmful gases are specified as described in Permit  
4 Attachment F.

5 These monitoring programs will be carried out during the period between the closure of the first  
6 panel and the initiation of final facility closure for the underground facility. The Permittees have  
7 prepared a Volatile Organic Compound Monitoring Plan (**VOCMP**) which will be implemented to  
8 confirm that the annual average concentration of volatile organic compounds (**VOCs**) in the air  
9 emissions from the underground HWDUs do not exceed the VOC concentrations of concern  
10 listed in Module IV and Permit Attachment N, Table N-3.1. The VOCMP is provided in  
11 Attachment N. The VOCMP includes monitoring design, sampling and analysis procedures and  
12 quality assurance objectives. This plan is required to demonstrate compliance with 20.4.1.500  
13 and .900 NMAC (incorporating 40 CFR §264.602 and §270.23(a)(2)).

14 The Permittees will collect air samples upstream of all open and closed panels, and down  
15 stream of Panel 1 beginning just prior to waste emplacement and proceeding until after  
16 certification of the closure of the last underground HWDU.

17 The VOCMP uses EPA Compendium Method TO-15. The Permittees have had success with  
18 TO-15 at the WIPP if care is taken in placing the sampler to avoid high dust and if stringent  
19 cleaning requirements are imposed for the clean canisters. This is necessary because of the  
20 extremely low concentrations that are being monitored. The Permittees are evaluating the use  
21 of the Fourier Transform Infra-Red (**FTIR**) technique for monitoring VOCs at WIPP. This method  
22 is being used successfully at other locations and has recently been approved by the EPA for  
23 measuring the concentration of VOCs in the headspace gases of drums of TRU waste. If FTIR  
24 becomes viable, the monitoring plan will be revised and the revisions will be submitted to the  
25 NMED for approval prior to implementation.

26 The VOCMP will be implemented under a Quality Assurance Plan that conforms to the  
27 document entitled "EPA Requirements for Quality Assurance Project Plans for Environmental  
28 Data Operations". Quality Assurance criteria required for the target analytes are presented in  
29 Table N-4 in Permit Attachment N. Definitions of these criteria are given in Permit Attachment N  
30 along with a discussion of other requirements of the Quality Assurance Program including  
31 sample handling, calibration, analytical procedures, data reduction, validation and reporting,  
32 performance and system audits, preventive maintenance, and corrective actions.

### 33 J-1a Post-Closure Plan after Final Facility Closure

34 A number of regulations deal with the period of time that begins once the WIPP has undergone  
35 final facility closure and decommissioning. Under 40 CFR Part 191, the period consists of an  
36 active control period and a passive control period; only one hundred (100) years of the active  
37 control period can be used in performance assessment. The Land Withdrawal Act (LWA) of  
38 1992 requires that the Department of Energy (DOE) prepare and submit a post-  
39 decommissioning land management plan. 20.4.1.500 NMAC (incorporating 40 CFR §264.117)  
40 requires post-closure care, including monitoring, security, and control of property use. Because  
41 of the numerous regulations, the Permittees have prepared a single strategy for post-closure  
42 management of the WIPP. This strategy consists of three elements: 1) active controls, 2)

1 monitoring, and 3) passive controls. Only the first and second elements occur within the post-  
2 closure period covered by this permit.

### 3 J-1a(1) Active Institutional Controls

4 Once a facility is decommissioned, positive actions (referred to as "active institutional controls")  
5 will be taken to assure proper maintenance and monitoring. The EPA, in 40 CFR §191.14(a)  
6 has specified that active controls will be maintained for as long as practicable and that no more  
7 than one hundred (100) years of active institutional control can be assumed in predictions of  
8 long-term performance. This assumption assures that future protection and control does not rely  
9 on positive actions by future generations.

10 The Permittees' active institutional control program has a primary objective of addressing all  
11 applicable requirements, including restoring the WIPP site as nearly as possible to its original  
12 condition, and thereby equalizing any preference over other areas for development by humans  
13 in the future. Restoration of the WIPP site includes any necessary remedial actions or cleanup  
14 of releases resulting from decommissioning. In addition, as part of the active institutional control  
15 program implemented under 40 CFR §194.14(a), the Permittees will implement monitoring  
16 systems suitable for assessing disposal system performance if such monitoring is feasible.

17 The Permittees will implement the active institutional control program as described in more  
18 detail below:

#### 19 Identification of Active Institutional Control Measures

20 A detailed explanation of the active institutional controls selected by the Permittees as part of  
21 this first step is provided in Permit Attachment J1 (WIPP Active Institutional Controls). This is  
22 the Permittees' reference design for active institutional controls. The reference design will be  
23 reviewed periodically and updated by the Permittees as appropriate during WIPP disposal  
24 operations. The ongoing review and evaluation ensure that the active institutional controls  
25 implemented are appropriate for the conditions that may exist at that time. The Permittees will  
26 review the reference design prior to implementation and all affected regulatory agencies will be  
27 consulted as part of this review. If updating the reference design proposes any changes in the  
28 Post-Closure Plan as described in this permit, the Permittees shall apply for a permit  
29 modification to include those changes, or submit the reference design and revised Post-Closure  
30 Plan as part of a routine permit renewal application, as required by 20.4.1.500 NMAC  
31 (incorporating 40 CFR 264.118(d)).

32 As part of the active institutional controls program, the Permittees have developed a set of  
33 active institutional controls which will be implemented. These are as follows:

- 34 • A fence line shall be established to control access to the repository's footprint  
35 area (the waste disposal area projected to the surface). A standard wire fence  
36 shall be erected along the perimeter of the repository surface footprint. The fence  
37 shall have gates placed approximately midway along each of the four sides.
- 38 • An unpaved roadway along the perimeter of the barbed wire fence shall be  
39 constructed to provide ready vehicle access to any point around the fenced

1 perimeter, to facilitate inspection and maintenance of the fence line, and to  
2 permit visual observation of the repository footprint to the extent permitted by the  
3 lay of the land. This roadway shall connect to the paved south access road.

- 4 • To ensure visual notification, the fence line shall be posted with signs having as  
5 a minimum, a legend reading "Danger—Unauthorized Personnel Keep Out" and  
6 a warning against entering the area without specific permission of the Permittees.
- 7 • Contractual arrangements shall be developed to ensure that periodic inspection  
8 and necessary corrective maintenance is conducted on the fence line, its  
9 associated warning signs, and the roadway. The Permittees will maintain control  
10 over all contractual work and will maintain, in the operating record, the results of  
11 all inspections and maintenance activities.
- 12 • Through direct Permittee staffing support and/or contractual arrangements,  
13 procedures shall be established to provide routine periodic patrols and  
14 surveillances of the protected area by personnel trained in security surveillance  
15 and investigation.
- 16 • Mitigating actions will be taken to address any abnormal conditions<sup>1</sup> identified  
17 during periodic surveillance and inspections.
- 18 • Reports of activities associated with the post-disposal active access controls  
19 shall be prepared in accordance with regulatory requirements for submittal to the  
20 appropriate regulatory and legislative authority.

21 Details on meeting these criteria are found in Permit Attachment J1.

#### 22 Preparation of a Post-Decommissioning Land Management Plan

23 Section 13(b) of the LWA requires the DOE to prepare and submit a plan for managing the land  
24 withdrawal area after decommissioning the WIPP facility. This plan will include a description of  
25 both the active and passive institutional controls that will be imposed after decommissioning is  
26 complete. This plan will be prepared in consultation with the Department of Interior and the state  
27 of New Mexico. If the land management plan proposes any changes in the Post-Closure Plan as  
28 described in this permit, the Permittees shall apply for a permit modification to include those  
29 changes, or submit the land management plan and revised Post-Closure Plan as part of a  
30 routine permit renewal application, as required by 20.4.1.500 NMAC (incorporating 40 CFR  
31 §264.118(d)).

#### 32 Preparation of the Active Institutional Control Plan

33 An active institutional control plan will be initiated prior to actual plant closure, and will contain  
34 all the information needed to implement the active and passive institutional controls for the  
35 WIPP facility. Active institutional control planning will be based on the reference design and will

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<sup>1</sup> "Abnormal conditions" include any natural or human-caused conditions which could affect the integrity of Active Institutional controls required by the Permit or which could affect compliance of the WIPP with applicable RCRA standards.

1 take into account the most current information regarding the facility and its vicinity and will make  
2 use of state-of-the-art materials and techniques. This plan will include acceptable  
3 decontamination levels, sampling and analysis plans, and QA/QC specifications. If such future  
4 plan contains provisions different from those in this Post-Closure Plan or Permit Attachment J1  
5 (Active Institutional Controls), the Permittees shall submit a request for modification of the Post-  
6 Closure Plan and the WIPP Permit. The changes must be approved and made part of the  
7 revised Permit before the changes are implemented, in accordance with 20.4.1.500 NMAC  
8 (incorporating 40 CFR §264.118(d)).

#### 9 Implementation of Active Institutional Control Measures

10 Most of the active institutional control measures, such as long-term site monitoring and site  
11 remedial actions, will be implemented simultaneously with facility closure. However, it may be  
12 possible to implement some measures earlier. For example, salt disposal may begin prior to  
13 final plant closure. Reclamation and restoration of unused disturbed surface areas has already  
14 begun. Guarding and maintenance activities, which are already in place, could evolve into an  
15 appropriate type of post-closure activity, subject to appropriate modifications of the Permit.

#### 16 J-1a(2) Monitoring

17 Post-closure groundwater monitoring will involve a continuation of the monitoring plan in Permit  
18 Attachment L as described in Module V. The sampling frequency may be changed to biannually  
19 after final facility closure is complete by modification of the Permit as approved by the Secretary  
20 of the NMED in accordance with 20.4.1.901.B NMAC (incorporating 40 CFR §270.42). In  
21 addition, the final target analyte list specified in Permit Attachment L may be changed by permit  
22 modification based on final volume of waste.

#### 23 J-2 Notices Required for Disposal Facilities

#### 24 J-2a Post-Closure Certification

25 Within sixty (60) days of completion of the post-closure care period after final facility closure, the  
26 Permittees will submit to the Secretary of the NMED, via registered mail, a certification that  
27 post-closure care was performed in accordance with the specifications of the approved post-  
28 closure plan. The certification will be signed by the Permittees and by an independent New  
29 Mexico registered professional engineer. Documentation supporting the independent registered  
30 engineer's certification and a copy of the certification will be furnished to the Secretary of the  
31 NMED.

#### 32 J-2b Post-Closure Notices

33 Within sixty (60) days after certification of closure of each underground HWDU or final facility  
34 closure, the Permittees will submit to the Secretary of the NMED, and to the Eddy County  
35 government or other applicable local government agencies, a record of the type, location, and  
36 quantity of hazardous wastes disposed of in each underground HWDU as required in  
37 20.4.1.500 NMAC (incorporating 40 CFR §264.119).